A COMPENDIUM OF RESEARCH PUBLICATIONS 2020-2021

VOL - V

ST JOSEPH ENGINEERING COLLEGE

An Autonomous Institution

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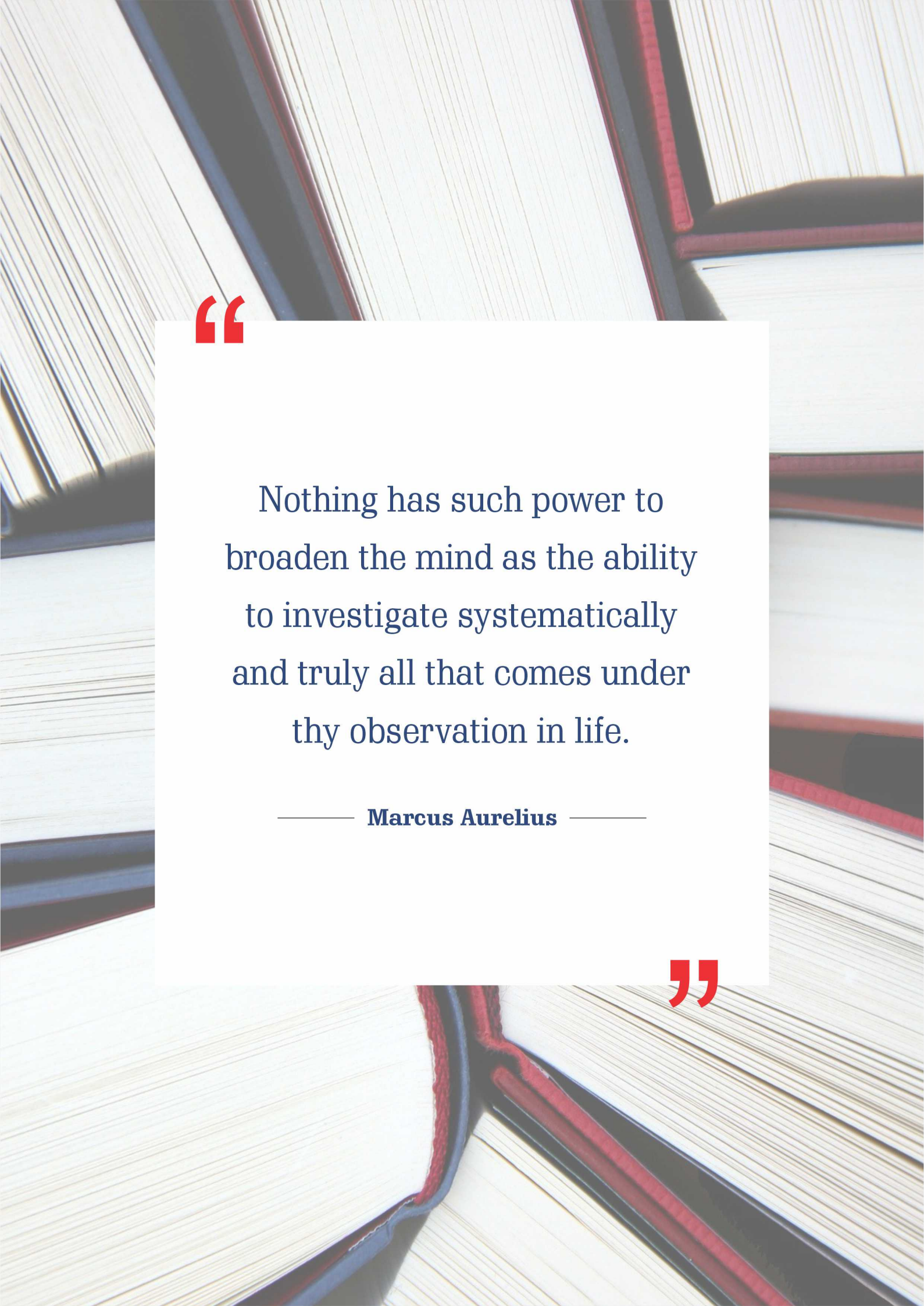

“Nothing has such power to broaden the mind as the ability to investigate systematically and truly all that comes under thy observation in life.”

Marcus Aurelius

ESTD: 2002

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Message

I am happy to pen a message down for the fifth volume of the Compendium of Research Publications 2020 - 2021, a compendium that compiles the faculty research and publications report to showcase how our faculty members are actively engaged in the creation and sharing of knowledge.

Sir Isaac Newton, the famous English scientist, once said "If you have seen further than others, it is by standing on shoulders of giants"

Of course, Newton wasn't literally standing on the shoulders of giants. Newton was explaining that his ideas didn't come from him alone. He relied on the ideas of those who came before him. When Newton used the word giant, he meant people who were giants in the scientific community. These were the people who, before him, made big contributions to our knowledge. Newton, even though he was a genius himself, knew that he couldn't have come up with his scientific breakthroughs on his own.

Innovative research ideas have to come from somewhere. No matter how unique or unprecedented a work seems, dig a little deeper and you will always find that the originator stood on someone else's shoulders. They mastered the best of what other people had already figured out, then made that expertise their own. With each iteration, they could see a little further, and they were content in the knowledge that future generations would, in turn, stand on their shoulders.

Standing on the shoulders of giants is a necessary part of creativity, innovation, and development. It doesn't make what you do less valuable. Embrace it. I hope this Compendium of Research Publications will become shoulder to upcoming innovative research activities of the college. The 172 research articles written by our faculty which are compiled in this compendium may become the guiding light to research community of our college and also encourage other faculty to take up research and innovation as integral part of the teaching learning process.

I would like to appreciate the effort of the editorial team for coming up with this volume in the limited time they had. I also congratulate every faculty member for their immense contribution to this volume.

Thank you and God be with you all.

Rev. Fr Wilfred P. D'Souza

Director – SJEC

Message

It is a matter of great pride and satisfaction for St Joseph Engineering College to bring out the Compendium of Research Publications 2020-2021, Volume V. The College has made tremendous progress in the past years in the academic & research areas. Recently the College has achieved two important milestones such as NAAC A+ as well as Autonomy. This Compendium which reflects the publications published by the faculty of each department is a mirror to the budding researchers. I congratulate the faculty & students who have contributed to this compendium. Congratulations to the Editorial team for compiling the publications & publishing it meticulously.

Rev. Fr Alwyn Richard D'Souza

Assistant Director

Message

"Where the signposts end, the trail begins." -Marty Rubin

Research Papers that are published serve as signposts of the path taken by the research community of an institution when exploring the landscape of knowledge. Frequent and well-defined signposts make the experience of those who want to follow our research a pleasing one. The Compendium of Research Publications creates a veritable map of such research papers; thereby helping researchers to navigate our own research more easily. The effort put in by the committee in preparing the compendium is a valuable contribution when looked at from this perspective.

And it is true that new research can start only after the literature survey ends and gaps in published research are clearly understood. That is where the trail of the new researcher begins!

The editors and committee concerned with the composition of this compendium have spared no efforts to bring out an excellent publication. Congratulations to them!

With Best Wishes

Dr Rio D'Souza

Principal

Editorial

The objective of publishing this Compendium is to showcase the abstracts of the publications of our faculty published in scholarly publications.

The spontaneous contributions from our faculty enabled us to bring out the fifth volume of the Compendium of Research Publications successfully. This volume of the Compendium consists of 172 research articles published during 2020 & 2021 by our faculty in the scholarly National & International Journals and Conference Proceedings. Out of which 56% were published in International Journals and 30% in International Conferences and others in National Journals & Book Chapters. We congratulate our esteemed faculty for their contribution.

We thank the members of the Editorial Board for their constant support in compiling the Research Publications. Thanks to the Management, Principal Dr Rio D'Souza for their valuable advice & support in bringing out this Compendium.

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IJ-25	Rolvin S Dsilva Thirumaleshwara Bhat	Comparative study of pongamia biodiesel blends with titanium dioxide nanoadditives on performance parameters of CI engine	Journal of Critical Reviews, 7(10), 2020, pp 3238-3244	92
IJ-26	Josny Joy Jiji Abraham Jesna Sunny Jinu Mathew Soney C George	Hydrophobic, superabsorbing materials from reduced graphene oxide/MoS_2 polyurethane foam as a promising sorbent for oil and organic solvents	Polymer Testing, 87, July 2020, pp 106429	93
IC-27	Shreeranga Bhat Amith Kumar Pai Arun Kumar Advaith Ellath Valappil Gururaj Rao	Deployment of lean manufacturing in a die shop: An ASRS approach	AIP Conference Proceedings, 2236(1), May 2020, pp 050004	94
IC-28	Kenny Pritish Solomon Pereira Mohammed Al Tamash Sheikh Ravikantha Prabhu	Modeling and analysis for wear performance of coconut shell powder filled glass fiber composite using Taguchi approach	AIP Conference Proceedings, 2236(1), May 2020, pp 040012	95
IC-29	Prathviraj Hoigebazar James Valder	Analysis and comparison of compound parabolic solar concentrator configurations for box type solar cooker	AIP Conference Proceedings, 2236(1), May 2020, pp 030003	96
IC-30	Chiranth Bellur Prabhakar Santhosh Hanumanthe Hanumanthlal Shivanna Naik James Valder	Effect of content of SiC on Al 6061 processed through stir casting	AIP Conference Proceedings, 2236(1), May 2020, pp 040015	97
IJ- 31	Vinayambika S Bhat Shreeranga Bhat EV Gijo	Robust design of proportional integral controllers: a taguchi-grey approach	International Journal of Modelling, Identification and Control, 35(4),2020, pp 363 - 375	98
IJ-32	Canute Sherwin Suma Bhat Sudheendra P Hebbar	Effect of plating time on surface morphology and coating thickness of nickel plating on copper surface	Journal of Phase Change Materials, 1(1), 2021, pp 1-7.	99
IJ-33	Canute Sherwin Suma Bhat Sudheendra P Hebbar	Effects of current density on surface morphology and coating thickness of nickel plating on copper surface	Turkish Journal of Computer and Mathematics Education, 12(10), 2021, pp 79-83	100
IJ-34	Swaraj D Lewis Purushothama Chippar	Analysis of heat and mass transfer during charging and discharging in a metal hydride - phase change material reactor	Journal of Energy storage, 33(1), 2021, pp 102108.	101
IJ-35	Canute Sherwin Suma Bhat	Porosity study on microstructures of nickel-chromium alloy plating on copper substrate	Journal of Applied Surfaces and Interfaces, 9(1), 2021, pp 17-22.	102
IJ-36	Sushanth H Gowda A Avinash K Raju	Production optimization of vateriaindica biodiesel and performance evaluation of its blends on compression ignition engine	Sustainable Chemistry and Pharmacy, 22, September 2021, pp 100475	103
IJ-37	KV Suresh Peter Fernandes Raju K	Effect of injection pressure on performance and emission of CRDI engine operated with biofuel produced from cashew nut shell liquid mixed with honge methyl ester	International Journal of Latest Research in Engineering and Management (IJLREM), 5(2), February 2021, pp 12-	104

			20	
IJ-38	Venkatesh Babu K P Geethu Varghese Thadathil Varghese Joseph Purushothama Chippar	Spatial analysis of CO poisoning in high temperature polymer electrolyte membrane fuel cells	International Journal of Hydrogen Energy, 46(11), February 2021, pp 8179-8196,	105
IJ-39	Geethu Varghese Venkatesh Babu K P Thadathil Varghese Joseph Purushothama Chippar	A numerical investigation on thermal gradients and stresses in high temperature pem fuel cell during start-up	International Journal of Heat and Mass Transfer, 175, August 2021, 121365	106
IC-40	Canute Sherwin Suma Bhat Sudheendra P Hebbar	Nickel plating of copper moulds for preventing star crack defects - analytical and numerical approach	Proceedings of the International Conference on Emerging Trends in Nanoscience and Nanotechnology, 07 Aug. 2021, pp 119-126	107
IC-41	K V Suresh Peter Fernandes K Raju	Investigation on performance and emission characteristics of diesel engine with cardanol based hybrid biodiesel blends	Proceedings of the International Conference on Laser Deposition: Nanostructures, Hetero-structures and 2D layer, Materials Today: 35(3), 2021, pp 378-382	108
IC-42	K V Suresh Peter Fernandes K Raju	Effect of injection pressure on performance and emission of diesel engine with blends of Honge-Rice bran biodiesel	Proceedings of the International Conference on Laser Deposition: Nanostructures, Hetero-structures and 2D layer, Materials Today: Proceedings, 35(3), 2021, Pp 489-493.	109
IC-43	V S Vijay Jospeh Gonsalves	Effect of fuel intake temperature on performance and emission of diesel engine	Proceedings of the IOP Conference Series: Materials Science and Engineering 1065 (1), Mangalore, 2021, pp 012024	110
BC-44	Swaraj D Lewis Purushothama Chippar	A numerical study of metal hydride reactor embedded with helical coil heat exchnager	Mathematical Fluid Mechanics: Advances in Convective Instabilities and Incompressible Fluid Flow, edited by B. Mahanthesh, Berlin, Boston: De Gruyter, 2021, pp 201-222.	111
IJ-45	E V Gijo Shreeranga Bhat Jiju Antony Sung H Park	Ten commandments for successful implementation of design for six sigma	The TQM Journal, 33(8), 2021, pp. 1666-1682.	112
IJ-46	Vinayambika S Bhat Shreeranga Bhat Gijo E V	Simulation-based lean six sigma for Industry 4.0: action research in the process industry	International Journal of Quality and Reliability Management, 38(5), 2021, pp. 1215-1245.	113
IJ-47	Pavana Kumara B Shreeranga Bhat Gijo E V	Modelling and optimization of natural fibre reinforced polymer nanocomposite: application of mixture design technique	Multidiscipline Modelling in Materials and Structures, 17(2), 2021, pp. 507-521.	114
IJ-48	Shreeranga Bhat Rio D'Souza E S M Suresh Sathyendra Bhat Ragesh Raju Vinayambika S Bhat	Dynamic classroom strategies to address learning diversity	Journal of Engineering Education Transformations, 34(Special Issue), 2021, pp. 694–702.	115

IJ-49	Shreeranga Bhat Gijo E V Anil M.Rego Vinayambika S Bhat	Lean six sigma competitiveness for micro, small and medium enterprises (MSME): an action research in the Indian context	The TQM Journal, 33(2), 2021, pp. 379-406.	116
IC-50	Sharun Mendonca Thirumaleshwara Bhat Ravikantha Prabhu Rudolf Dsouza	Experimental analysis of influence of injection pressure on compression ignition engine with biodiesel and nanoparticles blend	Proceedings of the IOP Conference Series: Materials Science and Engineering, 1013(1), pp 012036	117
BC-51	Udaya Bhat K Devadas Bhat Panemangalore Suma Bhat	Equal channel angular processing—a modern deforming technique for quality products	Advanced Welding and Deforming - A Volume in Handbooks in Advanced Manufacturing, 2021, pp 381-423	118
IJ-52	Ajay Noronha Shreeranga Bhat E V Gijo Jiju Antony Alessandro Laureani Chad Laux	Performance and service quality enhancement in a healthcare setting through lean six sigma strategy	International Journal of Quality & Reliability Management, 30 November 2021	119
IJ-53	Amit Lathigara Lipika Gupta Binu K G Veena Kumar	Sustaining motivation of engineering students in India by managing their academic & affective needs	Journal of Engineering Education Transformations, 34(Special Issue), January 2021, pp 507-517	120
IJ-54	Poornesh M Shreeranga Bhat Rio D'Souza E S M Suresh Vinayambika S Bhat	Comprehensive strategy to inculcate professional skills among first-year students: a collaborative learning approach	Journal of Engineering Education Transformations, 34(Special Issue), January 2021, pp 599-606	121
MANAGEMENT AND BUSINESS ADMINISTRATION				
IJ-1	Dharmananda M Anjali Ganesh	Investment habits and preferences of investor towards stock market: an empirical study in Dakshina Kannada, Karnataka	Journal of Critical Reviews, 7(18), July 2020, pp 325-329	122
NJ-2	Dharmananda M Anjali Ganesh	The Impact of dividend policy on share price volatility	Studies in Indian Place Names, 40(48), March 2020	123
IJ-3	Anjali Ganesh	Assessing the customer satisfaction by measuring service quality using servqual scale	International Journal on Customer Relations, 8(1) 2020, pp 1-10	124
IJ-4	Anjali Ganesh	Perspective of consumer and retailer towards campco chocolates	Asian Man (The) – An International Journal, 14(1), January-June 2020, pp 52-58	125
IJ-5	Dharmananda M Anjali Ganesh	Impact of bonus issues announcement on share prices with special reference to auto ancillaries sector	DRSR Journal, UGC Care, 10(6), June 2020, pp 223-231	126
NC-6	Dharmananda M Anjali Ganesh	A study on price mechanism of spot and future price in commodity market with special reference to crude oil	National Conference on Start-Ups in India-Challenges, Issues & amp; Opportunities, Manel Srinivas Nayak Memorial Besant Institute of PG Studies, Mangaluru, February 2020.	127
IC-7	Dharmananda M Anjali Ganesh	Impact of Covid-19 on Indian economy	International Conference Tackling Opportunities and Vulnerabilities during the Pandemic- Techno and Human Approaches, SDM College of Business Management Post Graduation Centre for	128

			Management Studies and Research, Mangaluru, August 2020.	
IC-8	Dharmananda M Anjali Ganesh	Impact of interest rate on stock returns: an empirical study	12th International E-Conference on Business, Management & amp; Information Technology, Prestige Institute of Management, Gwalior, December 2020.	129
IC-9	Dharmananda M Anjali Ganesh	Indian stock market PE anomalies: an empirical study	International Conference on Advances in Mechanical Engineering Sciences and Management, Dayananda Sagar College of Engineering, Bangalore, December 2020.	130
IJ-10	Shakila Bolar Spulbar Cristi Prakash Pinto Birau Ramona Hawaldar Iqbal Thonse	The holiday effects in stock returns: a challenge for the textile and clothing industry of India	Industria Textila, 71(4), 2020, pp 327-333	131
IJ-11	Iqbal Thonse Hawaldar Ramona Birau Cristi Spulbar Babitha Rohit Prakash Pinto Thekkekutt M Rajesha Fabrizio Di Sciorio	Further evidence on efficiency of Bahrain bourse: a high challenge for other industries	Industrial Textile, 71(5), 2020, pp 458-466	132
IJ-12	Prakash Pinto Iqbal Thonse Hawaldar Guruprasad Kemminje Babitha Rohit Cristi Marcel Spulbar Felicia Ramona Birau Cristian Valeriu Stanciu	The impact of risk anomalies on the pharmaceutical sector of the Indian stock market a comparative analysis between pharmaceutical, FMCG and IT companies	Revista de Chimie, 71(2), 2020, pp 57-63	133
NJ-13	Praksah Pinto Pooja S Babitha Rohit	Effect of temperature on stock market indices: a study on NSE and BSE in India	Anveshana, 10(1), January – June 2020, pp 71- 87	134
IJ-14	Vinish P Prakash Pinto Iqbal Thonse Hawaldar Slima Pinto	Impulse buying behaviour among female shoppers: exploring the effects of selected store environment elements	Innovative Marketing, 16(2), 2020, pp 54-70	135
IJ-15	Slima Pinto Prakash Pinto Saad Znad Darwish Iqbal Thonse Hawaldar	Entrepreneurial skills and intention of graduate students for business start-ups: a survey from India	International Journal of Innovation, Creativity and Change, 14(3), 2020, pp 951-970	136
IJ-16	Niranjan Shetty Prakash Pinto	Self-help groups (SHGs): a profile analysis	International Journal of Advance and Innovative Research, 7(1), January - March, 2020, pp 114-117	137
IJ-17	Prakash Pinto Niranjan Shetty	Financial inclusion: promotional strategies and challenges	International Journal of Advance and Innovative Research, 7(1), January - March, 2020, pp 108-113	138
IJ-18	K Abhaya Kumar Prakash Pinto Iqbal Thonse Hawaldar B R Pradeep Kumar	Biogas from cattle dung as a source of sustainable energy: a feasibility study	International Journal of Energy Economics and Policy, 10(6), 2020, pp 370-375.	139
IJ-19	Roopesh	Entrepreneurs in the world of online	International Journal of	140

		marketing	Advanced Research, 8(6), June-2020, pp 578-583	
BC-20	Roopesh	Quick tour of new education policy-2020	New Education Policy- An overview, edited by Dr. Subhatra & Dr. S. Krishna Kumari, 2020, pp 113-116	141
NJ-21	Babitha Rohit Prakash Pinto	Impact of corporate social responsibility on financial performance of select sectors of Indian stock market	RVIM Journal of Management Research, 13(2), July-December 2021, pp 18-25	142
NJ-22	Vinish P Slima Pinto Prakash Pinto	Shopping with companions: implications on in-store checkout experience	Anveshana, 11(2), July-December 2021, pp 2-17	143
NJ-23	Babitha Rohit Prakash Pinto T Nancy	Impact on income and savings during covid-19 pandemic: a financial literacy study in Mangaluru city	Anveshana,**11(2),** July-December 2021, pp 55-67	144
IJ-24	Vinish Pallikkara Prakash Pinto Iqbal Thonse Hawaldar Slima Pinto	Antecedents of behavioral intention to use online food delivery services: An empirical investigation	Innovative Marketing, 17(1), 2021, pp 1-15	145
IJ-25	Vinish Pallikkara Prakash Pinto Iqbal Thonse Hawaldar Slima Pinto	Impulse buying behaviour at the retail checkout: an investigation of select antecedents	Business: Theory and Practice, 22(1), 2021 , pp 69-79	146
IJ-26	Vinola Preemal Dsouza Babitha Rohit	The impact of human resource accounting on the financial performance of consumer durable companies listed on NSE	International Journal of Research in Management & Social Science , 9(2)-I April - June 2021, pp 169-171	147
IJ-27	BabithaRohit Prakash Pinto R Sushmitha M.M Munshi	Competitive advantage and risk: impact on Indian stock market	Shanlax International Journal of Arts, Science and Humanities, 9(1), 2021, pp 75-79.	148
IJ-28	Abhaya Kumar Prakash Pinto Iqbal Thonse Hawaldar Cristi Spulbar Ramona Birau Minea Elena Loredana	Forecasting areca nut market prices using the arima model: a case study of India	Annals of the Constantin Brâncuşi University of Târgu Jiu, Economy Series, 2/2021, pp 4-18	149
IJ-29	Anjali Ganesh	Introspective parameter on talent managementfor service and manufacturing industry introduction	Academic Discourse: An International Refereed Research, 10(1), June 2021, pp 84-102.	150
IJ-30	Roopesh Sandhya M	Consumer buying behaviour in the course of COVID-19	Modern Thamizh Research, Special Issue, June 2021, pp 706-715	151
IJ-31	K AbhayaKumar Prakash Pinto Iqbal Thonse Hawaldar K G Ramesh	Can crude oil futures be the good hedging tool for tyre equities? evidence from India	International Journal of Energy Economics and Policy, 11(6), 2021, pp 523–537	152
IJ-32	Kepulaje Abhaya Kumar Prakash Pinto Iqbal ThonseHawaldar Cristi Spulbar Ramona Birau	Crude oil futures to manage the price risk of natural rubber: Empirical evidence from India	Agricultural Economics – Czech, 67,(10), 2021, pp 423–434	153
MASTER OF COMPUTER APPLICATIONS				
IJ-1	Bruce Mathew Mohamed E Algamar Ismail Sathyendra Bhat J T Gnana Sambanthan	Techniques for measuring attitudinal learning outcomes in computer science and engineering	International Journal of Engineering Research and Technology, 13(9), 2020, pp 2395-2401	154

IJ-2	Sathyendra Bhat Ragesh Raju Shreeranga Bhat Rio D'Souza	Enhancing the teaching-learning process through collaborative learning	Journal of Engineering Education Transformations, 33(Special Issue), January 2020, pp 185-191	155
IJ-3	Sathyendra Bhat Ragesh Raju Shreeranga Bhat Rio D'Souza	Redefining quality in engineering education through the flipped classroom model	Journal of Procedia Computer Science, 172, 2020, pp 906–914.	156
IJ-4	Sathyendra Bhat Ragesh Raju Shreeranga Bhat Rio D'Souza AthokpamBikramjit Singh	Constructive methodologies to overcome the technological barriers in online teaching-learning process	Journal of Engineering Education Transformations, 34(Special Issue), 2021, pp. 707–712.	157
IJ-5	Ragesh Raju Sathyendra Bhat Shreeranga Bhat Rio D'Souza AthokpamBikramjit Singh	Effective usage of gamification techniques to boost student engagement	Journal of Engineering Education Transformations, 34(Special Issue), 2021, pp. 713–717.	158
IJ-6	Vasudeva Hareesh B	An efficient image pre-processing technique for land use analysis by using remote sensing images	International Journal of Advanced Trends in Computer Science and Engineering, 10(1) January - February 2021, pp 308-315	159
IJ-7	Vasudeva Hareesh B	Image segmentation techniques using k-means clustering to identify the land use change detection	International Journal of Advanced Trends in Computer Science and Engineering, 10(2), March - April 2021, pp 1200-1206	160
ENGINEERING MATHEMATICS				
IJ-1	H S Ramananda A J Harsha	Embedding of concept lattice into its mixed concept lattice	Advances in Mathematics: Scientific Journal 9(7), 2020, pp 4389–4396.	161
IJ-2	Harsha A J Ramananda H S	A framework for student's result analysis using formal concept analysis	Journal of Critical Reviews, 7(19), 2020, pp 7649-7662.	162
ENGINEERING PHYSICS				
IC-1	Rajesh K Vincent Crasta Gananatha Shetty	Effect of CuONanofiller on PVA/PVP blend	AIP Conference Proceedings, 2269(1), 2020, pp 030091-1 - 030091-6	163
IC-2	B Gananatha Shetty Vincent Crasta K Rajesh	Advancement in structural, morphological and dielectric studies of PVA filled TiO2 and ZnO nanocomposites	AIP Conference Proceedings, 2269(1), 2020, pp 030092-1 - 030092-6	164
IC-3	Rithin Kumar N B Santhosha Acharya S C Gurumurthy Sangeetha Rajesh Kumar P C	TiO2/ZnONanofillers in tailoring the morphology and optical properties PMMA for optical device applications	International Conference on Advances in Material Science and Chemistry, Kerala, August 2020	165
IC-4	Rithin Kumar N B Santhosha Acharya Sangeetha Rajesh Kumar P C Gurumurthy S C	Enhancement in structural and optical properties of PMMA-ZnO and TiO2 filled nanopatterns hybrid composites for solar cell anti-reflection coating applications	International Conference on Accelerating Innovations in Material Science, Department of Chemistry, BMS Institute of Technology and Management, Bangaluru, August 2020.	166
NC-5	Clavian L M Rajesh Kumar P C Anil Kumar K V	The effect of electron beam treatment on the third order nonlinear optical nature of the TPP thin film in nano-	DAE- Solid State Physics Symposium, BARC Mumbai, December 2021	167

	Narayana Rao D Shihab N K Ganesh Sanjeev	second regime		
NC-6	Clavian L M Rajesh Kumar P C Anil Kumar K V Narayana Rao D Shihab N K Ganesh Sanjeev	Third order optical nonlinearity in amorphous TPP thin film at nanosecond regime	National Conference on Condensed Matter Physics and Applications, MIT, Manipal, September 2021	168
BC-7	Vincent Crasta Rajesh Kochi	Structural and optical study of metal oxide filled polymer blend	Newest Updates in Physical Science Research Vol. 10 14 July 2021, pp 80-92	169
ENGINEERING CHEMISTRY				
IJ-1	Pramila Rita D'Souza Jyothi Kudvaa A Sunil Kumara A Nityananda Shetty	Experimental and computational studies of N-(4,6-dimethylpyrimidin-2-yl)-4-[(quinazoline-4-yl)amino]-benzene-1-sulfonamide as an effectual corrosion inhibitor for mild steel in hydrochloric acid	Russian Journal of Chemistry, 94(8), 2021, pp. 1122–1133.	170
CENTRAL LIBRARY				
IJ-1	Felcy Dsouza	Research Publications Trend of St Joseph Engineering College, Mangaluru, Karnataka: A Bibliometric Study	Library Philosophy and Practice (e-journal), 4924,winter 1-7, pp 1-20	171
IJ-2	Felcy Dsouza	Awareness and use of open educational resources: a study	Library Philosophy and Practice (e-journal) , 6570, winter -11, pp 1-11	172

SUMMARY OF PUBLICATIONS 2020 - 2021

ARTICLES	CSE	CIVIL	EC	EE	ME	MBA	MCA	BASIC SCIENCE	LIBRARY	TOTAL
NC	-	-	-	-	-	1	-	2	-	**3**
IC	8	-	12	1	24	3	-	4	-	**52**
NJ	1	-	1	-	-	5	-	-	-	**7**
IJ	8	9	13	4	28	22	7	3	2	**96**
BC	6	1	3	-	2	1	-	1	-	**14**
TOTAL	**23**	**10**	**29**	**5**	**54**	**32**	**7**	**10**	**2**	**172**

NC-National Conference, **IC**–International Conference, **NJ**- National Journal, **IJ**- International Journal, **BC**- Book Chapter

Computer Science and Engineering

Cross Layer Impact Analysis and Adaptation of Hierarchical Service Based Applications

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ABSTRACT

An essential aspect of business processes executed as service-based systems (SBSs) is conformity to compliance requirements from various sources such as laws, regulations and service-level agreements. Categories of compliance requirements may be classified into temporal, data, resource and control-flow. Noncompliance to requirements of any category may lead to loss of reputation and huge compensations. Hence, the SBS has to instantaneously adapt in order to mitigate the effect of such violations. This study investigates the intra-layer impact of violation of a service on related entities in the service layer and the inter-layer inconsistencies caused in the business and infrastructure layer at a particular vantage point. We provide a proactive as well as reactive adaptation mechanism based on the type of fault occurred. After quantification of impacted region in the service layer and its ripple effect on the business process layer, we adapt by localizing the replacement of services to the impacted region. Existing studies on adaptation try to adapt or recover faults from any one of the categories only. Our cross-layer approach tries to overcome faults of the data, temporal, control-flow and resource category and has the advantage of minimal number of services replaced with reduced recovery time by invoking proactive adaptation measures at selected vantage point.

**Full paper: Service Oriented Computing and Applications, SOCA, https://doi.org/10.1007/s11761-019-00282-w, Springer Vol. 14, Issue No. 1, 2020, pp 49–63.*

Evolutionary Method of Detecting Intrusions using Different Population Dynamics

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ABSTRACT

Chaos theory plays a vital role in any evolutionary based algorithms for avoiding the local optima and to improve the convergence speed. Various researchers have used different methods to increase the detection rate and to speed up the convergence. Some researchers have used evolutionary algorithms for the same purpose and has proved that the application of those algorithms provide good results. Most of the researchers have used population sizes which remains constant throughout the evolution. It has been seen that small population size may result in premature convergence and large population size requires more computation time to find a solution. In this paper, a novel application of different population dynamics to the genetic programming (GP) algorithm has been applied to manage the population size. The main focus was to improve the accuracy of the normal GP algorithm by varying the population sizes at each generation. The experiments were conducted on the standard GP algorithm using static and dynamic population sizes. Different population dynamics has been used to check the effectiveness of the proposed algorithm. The results obtained has shown that dynamic population size gives better results compared to static population size and also solves the problem of local optima.

**Full paper: International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Vol. 9, Issue No.5, March 2020, pp 1924-1931*

Broker-Based Mechanism for Cloud Provider Selection

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ABSTRACT

Cloud computing has recently emerged as a new computing paradigm for delivering on demand virtualised computing resources over the internet on a pay-as-use basis. Applications hosted in cloud have different requirements which include both low level (resource) requirements and high level (performance) requirements. However, most of the cloud providers satisfy SLAs based on resource requirements rather than providing performance guarantees to applications. This gap creates a need for selecting a more suitable cloud provider who can satisfy performance requirements of applications along with resource requirements. This work aims at proposing a broker-based approach to rank cloud providers based on QoS requirements of customers. It helps the SaaS providers to save cost and complexity in choosing a suitable cloud provider for hosting applications. The experimental results show that proposed approach selects the suitable cloud provider for hosting various types of applications satisfying the needs of different cloud customers.

**Full paper: International Journal of Computational Science and Engineering, DOI: 10.1504/IJCSE.2020.107247, Vol. 22, Issue No.1, 2020, pp 50-61.*

Virtual Mouse using Hand Gestures with Chat Assistant

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ABSTRACT

In today's technological era, technologies are evolving at a rapid rate. One such promising concept is the Human-Machine Interface. Since computer science is showing considerable advancement, the significance of Image processing and human-computer interaction is becoming prominent. Image Processing is the use of computer algorithms to perform Image Processing on digital images and Human-Computer Interaction (HCI) is an interface with which we can virtually interact with systems with ease. Traditionally, to interact with the system we use hardware devices i.e. the mouse and keyboard. But due to the demand of virtualization and rapid growth of technology, this technique has been proposed. The system's webcam or built-in camera captures the frames and processes them to enable gesture recognition and carry out the various mouse functions. Thus, Human-Computer Interaction is enhanced by eradicating mouse hardware. A user-friendly Chatbot has also been implemented to assist the user on how to use the developed application which is embedded within a website that has been hosted on Microsoft Azure's web app service. This system provides an alternate solution for touchpads on laptops as they are not very convenient to use and can perform various operations like free movement, left-click, right-click, select, double click, drag, and drop, scroll up and scroll down.

**Full paper: International Journal of Research and Analytical Reviews, Vol. 7, Issue No. 2, June 2020, pp 776-779*

Intelligent Data Mining for Collaborative Information Seeking

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ABSTRACT

World Wide Web (WWW) contains different kinds of information whether it be social, educational, historical, sports, news, financial, weather, technology, politics etc. Most of the people spend time on the internet to access data for information seeking purposes. Information provided on the web is available in different formats like in text format, image format or video format, and they can be accessed through different access interfaces. Accessing information from such a large place i.e. World Wide Web through so many websites would become a very cumbersome process, therefore, in this paper, we present a new method which will produce information based on the user input using appropriate keywords. The data will be retrieved from the internet using Data Mining approach without the need for rules and training of pages. The main focus will be to extract or retrieve data of a person like educational qualifications, gender, contact information, contributions in his work, his/her social nature, etc. The query to be searched on the platform or model should have meaningful keywords attached to it best describing the person or else data of some different person might be fetched.

**Full paper: Proceedings of the International Conference on Computational and Bio Engineering CBE 2019: Advances in Computational and Bio-Engineering, Tirupati, 07 July 2020, pp 129-136.*

Chaos Multiobjective Evolutionary Based Technique to obtain Accurate Solutions in Intrusion Detection Systems

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ABSTRACT

Due to the rapid increase in technology, it becomes necessary to safeguard the system against any sort of external attacks. Intrusion detection system (IDS) plays a vital role in protecting the system against any sort of anomalous behavior. Whenever the system is prone to attack, it becomes difficult to identify the type of attack, due to different security policies of the network. In our research, we have developed a chaos multi objective framework that can be trained for different objectives and obtain solutions for each combination of objectives. This allows the end user to select the best solution among the broad range of solutions. Experiments were conducted on NSL-KDD, ISCX-2012 and CICIDS2017 datasets. The results obtained shows that Chaos-Non dominated Sorting Genetic Programming (chaos NSGP-II) algorithm produces better spread of solutions compared to the existing frameworks, Non dominated Sorting Genetic Programming (NSGP-II) and Multi objective Evolutionary Algorithms Based on Decomposition (MOEA/D). Chaos theory was used to control the population size, improve the convergence speed and to avoid falling into local optima.

**Full paper: Indian Journal of Computer Science and Engineering (IJCSE), DOI: 10.21817/indjcse/2020/v11i2/201102132, Vol. 11, Issue No. 2, March – April 2020, pp 188-194.*

Hybrid Approaches for Augmentation of Translation Tables for Indian Languages

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ABSTRACT

We discuss approaches for improving bilingual lexicon coverage by automatically suggesting translations for Out-Of-Vocabulary (OOV) terms, employing existing validated bilingual lexicon entries. Resource poor languages such as Hindi, Konkani and Sanskrit characterized by highly inflectional morphology were employed in our experiments. Known surface translations are mined for morphological similarities and bilingual morphemes thus learnt are used in suggesting word-word and phrase translations. Also, word-word translations are generated for the language pair Hindi-Sanskrit by pivoting bilingual stems and suffixes, with Konkani and English as bridge language, former a morphologically rich language while latter morphologically poor.

**Full paper: 19th IEEE International Conference on Machine Learning and Applications (ICMLA), DOI: 10.1109/ICMLA51294.2020.00157, Miami, USA, 14-17 December 2020.*

Analysis and Classification of User Comments on YouTube Videos

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ABSTRACT

We categorize the user comments posted on YouTube video sharing website based on their relevance to the video content given by the description associated with the video posted. Comments are analysed for polarity and are further segregated as positive or negative. A comparative analysis of classifier using the Bag of Words and Association List approaches is presented.

**Full paper: Procedia Computer Science 177, International Workshop on Artificial Intelligence for Natural Language Processing (IA&NLP 2020) November 2-5, 2020, Madeira, Portugal, pp 593–598.*

Communication-Aware Virtual Machine Placement in Cloud

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ABSTRACT

Cloud computing is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources which can be rapidly provisioned and released with minimal management effort. In cloud environment, resources are offered to the users in the form of virtual machines for hosting various types of application. These applications may be small application where entire component of application reside in a single virtual machine or composite application consisting of number of components, where each component reside in different virtual machine and communicate with each other. The virtual machines belonging to the same application have to communicate efficiently for better application performance. There is a need for a mechanism that increases the application performance and server utilization. This paper presents a communication aware placement of virtual machines for multi-tier web applications. The experiment is conducted using suitable number of Xen Cloud Platform enabled servers. The results shows improvements in performance.

**Full paper: Advances in Electrical and Computer Technologies - Select Proceedings of ICAECT 2019, Lecture Notes in Electrical Engineering, Coimbatore, 672, 2020, pp 1031-1042.*

Enhanced Learning and Improved Productivity of Students' using Project Based Learning Approaches for Programming Courses

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ABSTRACT

Active learning techniques surpassed traditionalteacher-centric approaches owing to their benefits of betterlearning from the stakeholders. The selection of a specificlearning strategy varies from one course to another forproductive results. Many students face difficulties inunderstanding programming subjects especially when itcomes to applying it practically for applicationdevelopments, since the curriculum permits only a certainnumber of specific programs to be implemented and somecourses will have only theoretical subjects without apractical component. Thus, it becomes a need of the hour tomake students productive in order to be confident inapplying concepts learnt to the application development.The proposed method of applying a combination of project-based learning involving collaborative learning will proveto be an effective platform for the students to enhance theirdesign & development skills. This experimentation hasbeen applied to a total of about 420 engineering studentsand the average performance in the university examinationsas well as their demonstration/oral presentation, vivaanswering skills are considered as metrics formeasurement. Apart from this, students' ability to facechallenges is gauged through their ability to excel inplacement drives for selection to various companies. Thisapproach has resulted in a significant improvement instudents' performance in the university examinations withup to 54% of the students securing higher grades. Apartfrom this, it has been estimated that there is animprovement in placement rate of up to 10 - 15% along withincrease in no. of offerings for the individual students.

**Full paper: Journal of Engineering Education Transformations, eISSN 2394-1707, Vol 34, Special Issue, 2021, pp 524-530*

AIOPS Prediction for Server Stability Based on ARIMA Model

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ABSTRACT

In today's competitive landscape, enterprises must constantly improve and speed up their IT operations to stay ahead. The application of AI and ML in IT operations will enhance the efficiency of IT operations while resolving IT issues quickly and reducing the alerts. The AIOPs is short for "Artificial intelligence for IT operations", that refers to multi-layered technology platforms that automate and enhance IT operations through analytics and machine learning (ML). One important use of AIOPs is, it can provide predictive alerts that let IT teams address potential problems before they lead to serious issues or outages. One such use case in IT infrastructure is to predict the stability of the server. The stability of the server depends on various performance metrics like CPU, Memory, Disk (storage health), NIC (network health) and Network services. IT Teams can proactively work on the server when the server stability is predicted as low. To predict the stability of the server, the AIOPs involves data collection, modelling and prediction. In this paper, we propose an AIOPs based framework for alert prediction for server stability. The framework includes data collection and preprocessing, time series modelling using ARIMA and alert prediction. We implemented data collection, preprocessing, time series modelling and evaluating and comparing the forecast of Naïve, average, and best fitted ARIMA models. The event prediction is out of scope from this paper. For server stability, we have considered CPU Utilization as a metric and CPU Utilization data is collected for the few data center servers.

**Full paper: International Journal of Engineering Research & Technology, ISSN: 2278 0181, Vol 10, Issue No 12, 2021, pp 128-134*

Multimodal Biometric System Using Undecimated Dual-Tree Complex Wavelet Transform

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ABSTRACT

A human identity assurance system using multimodal biometrics based on the Undecimated Dual-Tree Complex Wavelet Transform (UDTCWT) is proposed in this paper. Biometric sources from multiple modalities give better reliability and coverage than single modality. To represent the multimodal biometric images UDTCWT based descriptor is used. Histogram based features are computed using the small blockades that capture the salient features within the local region and helps in obtaining the invariance even though there exist intra-class variations. During the feature descriptor formulation, both local and global features of UDTCWT are used. In the experimentation, a bimodal combination of face-iris and face-palmprint is implemented to design the multimodal biometric system. Experiments are carried out in different configurations that proves the superiority of the proposed method.

**Full paper: Proceedings of the International Conference on Soft Computing and Signal Processing 2021: June 18-19, 2021, Hyderabad, India, Advances in Intelligent Systems and Computing, https://doi.org/10.1007/978-981-16-7088-6_56, vol 1413, Springer, Singapore, pp 621-631*

Enhanced Performance and Data Security using Elliptic Curve Cryptography in Cloud Environment

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ABSTRACT

Cloud computing provides access to resources of computing, network, storage on a demand basis over the internet for use by the customers. Cloud computing faces many challenges, which makes the users to be wary of using it to store their huge data and applications in the cloud. One of the prime challenges of cloud is security. Data is secured on the cloud by encrypting the data using a cryptosystem. From the literature survey of works carried out by researchers in the area of encryption algorithms, it is seen that Elliptic curve cryptography algorithm is very beneficial for performing computations on encrypted data on the cloud. The proposed work uses an enhanced ECC for securing cloud data. The experimentations have shown that the proposed mechanism provides better security and improved performance compared to the existing cryptographic mechanisms in practice.

**Full paper: Proceedings of the IEEE International Conference on Computational Performance Evaluation (ComPE-2021), DOI:0.1109/ComPE53109.2021.9751865(IEEE Explorer), Shilong, 1-3 December 2021, pp 869-873.*

Mining Morphological Similarities for Translation Lexicon Augmentation

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ABSTRACT

Bilingual subword correspondences have been proven to be significant in tackling the problem of out-of-vocabulary terms. In this paper, we present results of our study focused on automatic learning of bilingual subword units for translation lexicon augmentation. Experiments involve official Indo-Aryan languages including Hindi, Konkani and Sanskrit each of which are resource-poor and characterized by highly inflectional morphology. Bilingual subword units comprising of stem and suffix pairs are first learnt using morphologically similar surface translation forms and subsequently used in suggesting word-word translations. Bilingual subword units thus learnt are employed in generating phrase translations.

Full paper: Proccedings of the Ist Global Conference on Artifiial Intelligence and applications, Jaipur, In: Gao XZ., Kumar R., Srivastava S., Soni B.P. (eds) Applications of Artificial Intelligence in Engineering. Algorithms for Intelligent Systems, https://doi.org/10.1007/978-981-33-4604-830, Springer, Singapore, 2021, pp 375-386.

Video Description Based YouTube Comment Classification

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ABSTRACT

Bilingual subword correspondences have been proven to be significant in tackling the problem of out-of-vocabulary terms. In this paper, we present results of our study focused on automatic learning of bilingual subword units for translation lexicon augmentation. Experiments involve official Indo-Aryan languages including Hindi, Konkani and Sanskrit each of which are resource-poor and characterized by highly inflectional morphology. Bilingual subword units comprising of stem and suffix pairs are first learnt using morphologically similar surface translation forms and subsequently used in suggesting word-word translations. Bilingual subword units thus learnt are employed in generating phrase translations.

**Full paper: Proccedings of the Ist Global Conference on Artifiial Intelligence and applications, Jaipur, In: Gao XZ., Kumar R., Srivastava S., Soni B.P. (eds) Applications of Artificial Intelligence in Engineering. Algorithms for Intelligent Systems, https://doi.org/10.1007/978-981-33-4604-8_51, Springer, Singapore, 2021, pp 667-678.*

Hybrid Algorithm for Naïve Bayes based Credit Card Fraud Detection

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ABSTRACT

In today's world, the most widely means of payment in online and offline is the credit card [cc] which provides a method to provide cashless shopping. Credit cards being used are escalating and the fraudulent activity is also increasing due to which a huge amount of money is lost. Thus, it is very much essential to have mechanisms to overcome fraudulent activities. The existing systems used the users spending criteria to find out whether a fraud is happening. Even when multiple algorithms were used to predict fraudulent activity, the usage of a specific attribute led to the failure of few systems. The proposed system detects fraudulent activity of cc using ML. When a user makes a transaction, a combination of standard algorithms like logistic regression and decision trees along with hybrid algorithms like majority voting method and Adaboost are used to stop fraudulent transactions. The results of the hybrid algorithms form clusters by using the k-means algorithm and finally the Naive Bayes is used to do the final prediction whether it is fraud or not. Based on the results, it can be analyzed that the prediction is not accurate when the trained dataset is small and the accuracy increases with increase in the dataset.

**Full paper: Data Driven Approach towards Disruptive Technologies. Studies in Autonomic, Data-driven and Industrial Computing. Springer,Selected proceedings of MIDAS-2020, ISBN: 978-981-15-9873-9, Singapore, 2021, pp 461-469.*

Android App and RFID Based Smart Ration Distribution System

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ABSTRACT

In this paper we discuss about deploying a smart android application for ration service and ration availing through a online service. Additional to the e-service we also discuss about introducing RFID Card to replace the conventional ration card. In the proposed system the smart app is intended to be used for ration availing through online mode, thereby cutting down traditional means of ration availing. Online service offers two modes of availing ration, the beneficiary can opt to collect ration for him/herself or they can opt for others to collect the ration for them. Additional to the smart service, a unique RFID tag is assigned to one member of each family to verify their identity by RFID reader while collecting ration through FPS. Beneficiaries are given both option of availing ration either by online or offline and can make use of either as per their comfort.

**Full paper: IEEE International Conference on Mobile Networks and Wireless Communications (ICMNWC), DOI: 10.1109/ICMNWC52512.2021.9688465, Sri Siddhartha Institute of Technology, Tumakuru, December 3-4, 2021*

An Automated Robotic Arm: A Machine Learning Approach

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ABSTRACT

The term 'robot' generally refers to a machine that looks and works in a way similar to a human. The modern industry is rapidly shifting from manual control of systems to automation, in order to increase productivity and to deliver quality products. Computer-based systems, though feasible for improving quality and productivity, are inflexible to work with, and the cost of such systems is significantly high. This led to the swift adoption of automated systems to perform industrial tasks. One such task of industrial significance is of picking and placing objects from one place to another. The implementation of automation in pick and place tasks helps to improve efficiency of system and the performance. In this paper, we propose to demonstrate the designing and working of an automated robotic arm with the Machine Learning approach. The work uses Machine Learning approach for object identification / detection and traversal, which is adopted with Tensor flow package for better and accurate results.

**Full paper: IEEE International Conference on Mobile Networks and Wireless Communications (ICMNWC), ISBN: 978-1-6654-4607-5, DOI: 10.1109/ICMNWC52512.2021.9688512, Sri Siddhartha Institute of Technology, Tumakuru, December 3-4, 2021*

Heart Disease Prediction using Machine Learning Techniques

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ABSTRACT

Consequent to the modern world life style and the increase in heart diseases every year, people's lives are at risk. Heart diseases have become one of the most common reasons for fatalities these days, including in the young. Hence it has become very necessary to search and find the simplest and best solutions to predict the risk of getting these diseases in advance so that necessary steps can be taken to save the lives of people. This paper tries to find and produce a solution using certain medical datasets that could help predict the risk of heart diseases based on various parameters to find the percentage and level of risk of a patient. The predicted results can be used as a basis for the further steps that the user will choose to take and thus reduce unnecessary costs such as tests, scans and other expenses in many cases. The overall objective of our work is to predict the chances of getting a heart disease with few tests and attributes for the presence of heart diseases.

**Full paper: Proceedings of the 5th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT), 2021, pp 762-766.*

A Reward-based Active Learning Approach for Motivating and Engaging Students in a Large Classroom

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ABSTRACT

Student engagement activities in the teaching learning process have shown drastic developments and have helped not only in the exchange of information among students but also in the creation of knowledge. Active learning activities in teaching will allow students to participate in the learning process by reflecting on what they have learned. This can also include students working cooperatively in pairs or groups. Whether it is about understanding concepts from the lectures or the implementation of concept-related information from the textbooks, group activities are of great use, especially while handling large classes. Group activity like in-class teams helps students to exchange information among their peers. The purpose of the activity is to motivate the students and keep them engaged for the entire session. The in-class group activity proposed here is a reward-based approach which was a major motivation for the students and the competitive spirit among the teams kept them engaged in noting down the points being discussed in class and gathering information throughout the session. The students of the class showed a better understanding of the concepts and good performance during the assessment. This paper describes the effective deployment of active learning to enhance the attention span of the students and keep them engaged for the entire session and thereby provides effective Outcome-Based Education (OBE). The results show that the attainment of the students' performance is enhanced. Moreover, it improves team spirit and team performance through cooperative learning.

**Full paper: Journal of Engineering Education Transformations, eISSN 2394-1707, Vol 34, Special issue, January 2021, pp 574-578.*

A New Framework to Locate, Connect and Share Mobile Web Services through Intelligence Techniques

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ABSTRACT

The advancement in mobile technology is taking place at very high speed, especially in the case of smart devices. In recent years, the use of mobile phones has changed the life style of common people. As days pass, new and better technologies are emerging in this field which make the life of people easier and also help people to connect with one another in a better way than before. Initially, the usage of mobile phones was restricted only to make phone calls and send messages. The current use of mobile phones has evolved into a new revolution. The current smart phones provide almost all features that a laptop or desktop provides. It is also seen that social network has influenced a lot of message and call transfers among the known group of users. There are thousands of mobile applications available and most of these applications communicate to a well-known server or cloud service provider through the Internet and gives back an appropriate response to the mobile user. It is really challenging to find an interesting service provided by an unknown mobile user to another mobile user who is interested in receiving that service. In the present scenario, people find it difficult to pursue their interests or connect to other people of similar interests. Most of the times, mobile users are unaware of the activities that are happening around them. The main idea behind this work is to provide a framework to notify a mobile user about his interests currently available near him/her or in different locations. It connects people of similar interests in the location where they are currently in. This framework uses the existing SOAP and HTTP technologies along with redefined WSDL for describing web services on the mobile device. The data to be shared by the mobile web service provider may be generated by the sensors within the mobile device or the data is explicitly updated by the user dynamically or the data is collected from the external sensors/devices connected to internet of things through the mobile device. The cloud service is used to enable the service request mapping and repository. This framework may be used to define any web service on mobile devices and make them available to users based on interest, location and time. The main objective of the proposed work is to identify various dynamic location based mobile web services and to provide them a framework to share their services with the interested mobile service consumers.

**Full Paper: Evolutionary Intelligence, Vol 14, Issue No. 3, 2021, pp 433–444*

Efficient Scheduling of tasks in Cloud

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ABSTRACT

Wireless Cloud Infrastructure provides a pay-for-use basis data and infrastructure services over the internet. This enables the user to upgrade the software automatically. Only the space required for the server can be used, thus minimizing the carbon footprint. The main problem with cloud computing is task scheduling which reduces system performance. An efficient task-scheduling algorithm is required to improve the performance of the system. Existing task-scheduling algorithms concentrate on memory of the CPU, resource requirements of the task, run time and cost of execution. Bandwidth of the network is not considered in most of the researches. In this paper, an efficient algorithm for task scheduling has been introduced that performs scheduling of the tasks based on network bandwidth. By doing this, the tasks can be allocated based on the availability of the bandwidth of the network. In addition, the algorithm assigns the right number of tasks to each virtual machine. The results show that the execution time is reduced to a greater extent when the bandwidth factor is included in the algorithm.

**Full Paper: Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV), DOI: 10.1109/ICICV50876.2021.9388524, Publisher: IEEE, 04 to 06 February 2021, Tirunelveli.*

Scalable Two-Phase Top-Down Specification for Big Data Anonymization Using Apache Pig

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ABSTRACT

In big data applications, data privacy is one of the most concerned issues because processing of large-scale privacy-sensitive dataset often requires computation power provided by public cloud services. Sub-tree data anonymization, which is getting a good trade-off between data utility and distortion, is a popularly adopted scheme to anonymize dataset for privacy preservation. Top-down specialization (TDS) and bottom-up generalization (BUG) are two ways to fulfill sub-tree anonymization. Anonymizing dataset via generalization to satisfy certain privacy requirements such as *k*-anonymity is a widely used category of privacy-preserving techniques. It is a challenge for existing anonymization approaches to accomplish privacy preservation on privacy-sensitive large-scale dataset due to their insufficiency of scalability. Several methods focus on developing algorithms to determine the best cut of the taxonomy tree, the optimal value of *k* and the best option of anonymization technique either by top-down specification or by bottom-up generalization. This paper proposes a scalable two-phase top-down specialization (STPTDS) to anonymize large-scale dataset using Apache Pig on Hadoop.

**Full paper: Advances in Artificial Intelligence and Data Engineering, Chiplunkar, N., Fukao, T. (eds) Lecture notes in Advances in Intelligent Systems and Computing, https://doi.org/10.1007/978-981-15-3514-7_75, Vol 1133, Springer, Singapore, pp.1009-1021*

CIVIL ENGINEERING

Bioleaching of Iron from Fly Ash Using a Novel Isolated Acidithio Bacillus Ferrooxidans Strain and Evaluation of Catalytic Role of Leached Iron in the Fenton's Oxidation of Cephelaxin

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ABSTRACT

Iron is the sole energy source for the acidophilic bacterium Acidithiobacillus ferrooxidans. Feeding indirect iron source to this bacteria results in leaching of iron from complex minerals. In this study fly ash, a waste is fed to the isolated bacteria under stress condition and is made to recover the traces of iron present in the fly ash for its application as a Fenton's catalyst to degrade Cephalexin. The investigation evaluates the leaching potential of a novel isolated strain Acidithiobacillus ferrooxidans BMSNITK17 in leaching iron from fly ash. About 89 mg/L of iron is recovered within the initial five days of inoculation. It is observed that the rate of metabolism of bacteria is very slow with fly ash as source. Catalytic efficiency of recovered iron was investigated to degrade Cephalexin, a major waste found in pharmaceutical and hospital discharge. About 87.98% of Cephalexin is degraded in first two hours with COD reduction of 74.21%. Reaction follows pseudo-first order kinetics with rate constant 0.017/min.

**Full paper: Journal of the Indian Chemical Society, Vol. 97, Issue No. 3, International Conference on Chemical, Bio & Environmental Engineering, National Institute of Technology, Jalandhar, Punjab, February 2020, pp 360-367.*

Green Synthesis of Bioleached Flyash Iron Nanoparticles (GBFFeNP) Using Azadirachta Indica Leaves and its Application as Fenton's Catalyst in the Degradation of Dicamba

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ABSTRACT

Fly ash made its suitable application in the waste management and remediation application. This article presents the synthesis of nano iron particles using bioleached fly ash iron and its application as fenton's catalyst in the degradation of an herbicide dicamba. Novel isolated bacterial strain Acidithiobacillus ferrooxidans BMSNITK (MG 271840) was used to recover iron from fly ash and green synthesis of fly ash iron nano particles was successfully carried out using Azadirachta indica. Synthesized iron nano particles were characterized with x-ray diffraction and electron microscopy and the catalytic role of bioleached fly ash nanoparticles was evaluated based on the degradation of target pollutant. Hydrogen peroxide and COD were considered as the indicating factors for tracing the reaction progress and degradation resulting 97 % of dicamba degradation within 90 minutes. Study confirms the green synthesis of bioleached fly ash iron nano particle and its application in Fenton's oxidation.

**Full paper: International Conference on Trending Moments and Steer Force, Goa, Lecture Notes in Civil Engineering, Springer Nature, https://doi.org/10.1007/978-981-15-8293-6_31 , P-ISBN 978-981-15-8292-9, E-ISBN 978-981-15-8293-6, 24th November 2020, pp 365-371.*

The Impact of Carbon-Based Nanomaterial Additions on the Hydration Reactions and Kinetics of GGBS-Modified Cements

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ABSTRACT

Carbon-based nanomaterials have been identified as a viable additive to cement for making high performance binders with exceptional properties. However, on a few studies have considered the impact of these additives in combination with the environmentally motivated use of supplemental cementitious materials. In this work, the effect of two carbon-based nanomaterials, graphene and graphene oxide, on the hydration kinetics of cement modified with various levels of ground granulated blast furnace slag has been documented. The hydration was characterized with in-situ calorimetry measurements and thermogravimetric analysis over 28 days. The analysis monitors the phase development and degree of hydration during the cement curing period. The results show a strong synergy between choice of nanomaterial chemistry and the use of supplemental cementitious material. High confidence correlations between the degree of hydration and compressive strength, with R2 greater than 0.9, across the various combinations of additives, showing the importance of hydration analysis for predicting the cement properties.

**Full paper: Construction and Building Materials, 303, October 2021, pp 124366*

Fresh and Hardened Properties of GGBS-Contained Cementitious Composites Using Graphene and Graphene Oxide

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ABSTRACT

The addition of nanomaterials affects the workability of cementitious composites by reducing the free water available within the mixtures. In order to address this issue, the present study intends to study the addition of ground granulated blast furnace slag (GGBS) in cementitious materials containing graphene (G) and graphene oxide (GO). An experimental program is considered to measure fresh properties, compressive strength, and service life of cementitious composites. Dosages of 0.03% and 0.06% (by weight of cement) of G and GO are tested in cement pastes and mortars. GGBS in three different dosages of 15%, 30%, and 45% is investigated. A constant water/cement ratio of 0.35 is used in all mixtures. Results show that GGBS improves the yield stress and plastic viscosity of G- and GO-modified cementitious composites. Moreover, GGBS dosages of 30% and 45% compensate the reduced fluidity of 0.03 wt% of G- and GO-modified cementitious composites, respectively. The thixotropy of the composite paste containing GO decreases with the addition of GGBS. Moreover, comparable and slightly improved compressive strengths are obtained for mixtures containing GGBS. The results from the nomogram show a promising trend for the service life of mixtures containing G, GO, and GGBS.

**Full paper: Construction and Building Materials 303, October 2021, pp 123902.*

Application of Superabsorbent Polymer as Self-Healing Agent in Self-Consolidating Concrete for Mitigating Precracking Phenomenon at the Rebar–Concrete Interface

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ABSTRACT

Improved autogenous healing capacity of concrete using superabsorbent polymers (SAPs) was used as an efficient approach for mitigating damage between steel rebar and self-consolidating concrete (SCC). The results for normal concrete (NC) and those for SCC mixtures were compared. Two SAPs with different particle sizes and chemical compositions were used in the experimental program. Results showed that despite the greater reduction effect of SAP with a smaller particle size on compressive strength, SCC containing this type of SAP had the highest bond strength in uncracked specimens, compared with SAP with larger particle sizes, for SAP-modified NC and SCC mixtures. Moreover, results showed that SCC and NC containing SAP had considerably greater healing improvement factors for large crack widths ($w \geq 0.30$ mm) compared with mixtures without polymers; almost 46%, 30%, and 24% healing improvement factors were obtained for average bond stress, bond strength, and residual bond stress of SAP-containing concrete mixtures, respectively. Furthermore, complete strength recovery (100% healing improvement factor) was obtained for SCC mixture with $w=0.10$ mm after a 28-day healing period.

**Full paper: ASCE's Journal of Materials in Civil Engineering, Vol. 33, Issue No. 10, pp 04021269.*

The Effect of Air-Entraining Admixture and Superabsorbent Polymer on Bond Behaviour of Steel Rebar in Pre-Cracked and Self-Healed Concrete

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ABSTRACT

This paper intends to study the effect of air-entraining admixture (AE) on self-healing method at rebar-concrete interface using superabsorbent polymer (SAP). AE with a constant dosage of 0.83 kg/m3, and 0.25% and 1.0% SAP dosages are considered. Two types of superabsorbent polymer with different chemical compositions and particle sizes are considered for the experimental tests. Pull-out test results of mixtures containing AE admixture are compared with those in non-AE concrete. Scanning electron microscopy/energy dispersive X-ray spectrometry (SEM/EDS) along with microscopic analysis is performed to study the healing products at crack surface and SAP macro voids around the rebar. Overall, results indicate that AE admixture has a considerable impact on the performance of the self-healing method at the rebar-concrete interface especially for higher dosage of SAP (1.0%). This can be attributed to the internal voids networks around the rebar generated by AE admixture, which can ease the water transfer between SAP macro voids to participate in healing cracks after wet-dry cycles. SEM analysis shows that stalactites, healing products at the external surface of crack, are composed of a large amount of calcium and oxygen.

**Full paper: Construction and Building Materials, 281, April 2021, pp 122568.*

Effect of Concrete Workability on Bond Properties of Steel Rebar in Pre-Cracked Concrete

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ABSTRACT

Although research has shown a considerable influence of the pre-cracking phenomenon on steel-congested concrete members, only normal concrete (NC) has been considered in the literature. The intention in this paper is thus to study the effect of the pre-cracking phenomenon on the bond response of pre-cracked NC with different slump flow values and self-consolidating concrete (SCC). Initial crack widths ranging from 0.0 to 0.5 mm are studied. Results show that initial crack widths larger than 0.10 mm have a significant influence on bond properties, such that reduction factors greater than 30% and 50% are obtained for the maximum bond strength of concrete specimens exposed to initial crack widths of 0.2 mm and 0.4 mm, respectively. Results show that concrete mixtures with higher workability are less sensitive to the pre-cracking phenomenon as compared to NC mixtures. The average bond stress of steel rebar in the pre-cracked SCC is found to be similar to that of the NC with a slump flow of 200 mm, which is considerably better than for NC with a slump flow of 97 mm. Moreover, results show that 65.8, 80.6, 88.5 and 93.1% fracture energy reductions are obtained for crack widths of 0.20, 0.30, 0.40 and 0.50 mm, respectively, as compared to the small crack width of 0.15 mm.

**Full paper: Proceedings of the Institution of Civil Engineers - Structures and Buildings, Vol 175, Issue No. 5, pp 1-14.*

Bioleaching of Iron from Laterite Soil using an Isolated Acidithiobacillus ferrooxidans Strain and Application of Leached Laterite Iron as Fenton's Catalyst in Selective Herbicide Degradation

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ABSTRACT

A novel isolated strain Acidithiobacillus ferrooxidans BMSNITK17 has been investigated for its bioleaching potential from lateritic soil and the results are presented. System conditions like pH, feed mineral particle size, pulp density, temperature, rotor speed influences bioleaching potential of Acidithiobcillus ferrooxidans BMSNITK17 in leaching out iron from laterite soil. Effect of sulfate addition on bioleaching efficiency is studied. The bioleached laterite iron (BLFe's) on evaluation for its catalytic role in Fenton's oxidation for the degradation of ametryn and dicamba exhibits 94.24% of ametryn degradation and 92.45% of dicamba degradation efficiency. Fenton's oxidation performed well with the acidic pH 3. The study confirms the role of Acidithiobacillus ferrooxidans in leaching iron from lateritic ore and the usage of bioleached lateritic iron as catalyst in the Fenton's Oxidation.

**Full paper: PLoS ONE, Vol. 16, Issue No. 3, March 2021, pp e0243444*

Clay as a Sustainable Binder for Concrete—A Review

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ABSTRACT

The negative environmental impacts of Portland cement as a binder in the construction industry have created a growing impetus to develop sustainable alternative binders. Various types of clay have been considered as potential cement replacements. The impact of clays as cement replacement depends on the dosage and treatment methods. This paper presents a comprehensive review to determine the effects of different types of clay on the fresh and hardened properties of concrete mixtures by analyzing the experimental database reported by the literature, including raw, calcined, modified, nano, and organo. This study intends to show the process of optimizing the use of clay in concrete, the reason behind converting raw clay to modified types, and research gaps through a comparison study between different types of clays. The present review study shows that clay-based concrete mixtures have higher thixotropy and yield stress values, improving shape stability. This results in lower early-age shrinkage of the concrete. However, the high floc strength of clay-based concrete causes a reduction in flowability. Treatment methods of raw clay, such as calcination and nano-sized clay particles, improve concrete compressive strength. General results of the previous studies highlight that all types of clay investigated positively affect the resistance of concrete to environmental attack.

**Full paper: Construction Materials, Vol 1, Issue No. 3, 2021, pp.134-168.*

How Admixtures Affect Yield Stresses of Cement

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ABSTRACT

A factorial experimental design plan was used to compare admixtures (high-range water-reducing admixture, viscosity-modifying agent, accelerator, calcium silicate hydrate [CSH] seeds, and nanoclay) in a cement and silica fume blend. Two methods were tested to measure the structuration rate: the constant velocity method and the creep recovery method. The measurements were performed with a rotational rheometer with a double-helical spiral geometry to reduce slippage. The evolution of yield stress and thixotropy of the mixtures at four resting times was evaluated, providing insight into the stress that the recently printed structure can withstand. The creep recovery method generally provides a higher static yield stress than the constant velocity method, except for the stronger mixtures, raising additional questions on the effect of the paste history on microstructural buildup mechanisms. When the extruder begins, shear is applied and the microstructure is broken, causing the dynamic yield stress to be lower than the static yield stress. The effect of the admixtures on thixotropy is discussed.

Full paper: ACI Materials Journal, Vol 118, Issue No 6, January 2021, pp 311-324

ELECTRONICS AND COMMUNICATION ENGINEERING

Modified 32-Bit Shift-Add Multiplier Design for Low Power Application

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ABSTRACT

Multiplication is a basic operation in any signal processing application. Multiplication is the most important one among the four arithmetic operations like addition, subtraction, and division. Multipliers are usually hardware intensive, and the main parameters of concern are high speed, low cost, and less VLSI area. The propagation time and power consumption in the multiplier are always high. The multiplier speed usually determines the speed of the processor. Hence in this work, a design of a 32-bit multiplier is proposed by modifying the conventional shift-add multiplier. The proposed structure reduces the power consumed by the technique of minimizing the switching activities in the design. A 32-bit parallel prefix adder based on the modified Ling equation is also proposed to speed up the addition of the partial products in the multiplier. The design is modelled in VHDL and implementation is carried out in CADENCE software with 90 nm and 180 nm CMOS technology.

**Full paper: Iranian Journal of Electrical and Electronic Engineering, Iran University of Science and Technology, Vol. 16, Issue No. 4, 2020, pp 487-493.*

An Efficient Architecture for Modified Lifting-Based Discrete Wavelet Transform

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ABSTRACT

A high speed and memory efficient lifting based architecture for one-dimensional (1-D) and two-dimensional (2-D) discrete wavelet transform (DWT) is proposed in this paper. The lifting algorithm is modified in this work to achieve a critical path of one multiplier delay with minimum pipeline registers. A 1-D DWT structure with two-input/two-output and four-input/four-output is developed based on the modified lifting scheme. The proposed 2-D DWT architecture for the Daubechies 5/3 and 9/7 filter comprises of two 1-D processors, together with a transpose and a temporal memory. An efficient transpose block is presented, which utilizes three registers to transpose the output sequence of the 1-D DWT block. The transpose block is independent of the size of the image read for the transform. The scanning process of an N × N image for a one-level 2-D transform is in Z fashion to minimize the temporal buffer to 4N and 2N for the 9/7 and 5/3 mode DWT respectively. The comparison results show that the proposed structure is hardware cost-effective and memory efficient, which is favourable for real-time visual operations. The model is described in VHDL and synthesized using the Cadence tool in 90 nm technology.

Full paper: Sensing and Imaging Springer, Vol. 21, Issue No. 53, 2020, pp 1-22.

A Comparative Study on Low Power Adders for Wearable Devices

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ABSTRACT

An adder is a device used to perform arithmetical functions in electronic calculators and digital instruments and has a wide range of applications. The major factor involved in driving all these instruments is Power. As the power consumption of a device increases, the life span of device reduces. In order to maintain longer life of the device, it is necessary that the power consumption is less. A device is considered efficient when it consumes low power and has high speed. The purpose of this study is to investigate the power and delay product of the adders. The adders that have been compared are all of 12 bit and have been synthesized and simulated using the Cadence software. The outcomes of different properties obtained from the synthesis reports and simulation of the circuit helps in finding out the adder with minimum power and delay product. The adders that have been compared in this paper are Ripple Carry Adder (RCA), Carry Look Ahead Adder (CLA), Carry Increment Adder (CIA), Carry Select Adder (CSA) and Kogge Stone Adder (KSA).

**Full paper: International Journal of Scientific & Technology Research, ISSN 2277-8616, Vol 9, Issue No. 10, October 2020, pp 252-255*

Enhancement of Underwater Images Using Homomorphic Filtering and CLAHE Technique

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ABSTRACT

Under water images mainly suffer from absorption and scattering effects of light, which leads to poor visibility in the captured images. To enhance the degraded images for the further analysis, Homomorphic filtering and Contrast Limited Adaptive Histogram Equalization (CLAHE) techniques are used. Homomorphic filter corrects the non-uniform illumination and CLAHE enhances the contrast of an image. Also, this paper discusses the causes of underwater image degradation and methods to recover degraded image. The qualitative and quantitative analysis of enhanced underwater images show that Homomorphic and CLAHE techniques enhanced underwater images with improved contrast, sharpness in edges and better exposure of dark region.

**Full paper: Journal of Innovation in Information Technology, ISSN: 2581-723X, Vol. 4, Issue No. 1, January - Jun 2020, pp 34-39*

Designing Standard Cell Library for Ultra-Low Power Devices using 45nm Technology

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ABSTRACT

The proposed work focuses on the standard cell library (SCL) design, specifically for ultra-low power applications using 45 nm technology. A few of the commonly used methodologies are Sub-threshold design and Near -threshold design. The technique used here is sizing of the FETs to obtain equal rise and fall time and reduction of the supply voltage to minimize the power consumption. Other techniques include the sub-threshold cell sizing under process variation, measuring the reliability of cells using noise margin, forward body bias technique in NTV region, supply voltage scaling, etc. Inverter, NAND, NOR, and AOI gates were simulated in ring, chain, and FO4 configurations. The supply voltages of 0.6V and 0.4V with Wp/Wn ratios of 390nm/260nm and 180nm/ 120nm are used respectively.

Full paper: Kala Sarovar, ISSN: 0975-4520, Vol 23, Issue No.2 (V), July-September 2020.

Detection Classification and Cutting of Fruits and Vegetables Using Tensor flow Algorithm

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ABSTRACT

This paper presents automatic fruit and vegetable recognition and chopping mechanism. This work aims to reduce the time taken for cutting fruits and vegetables in a large kitchen. This mechanism has two parts. The first part of the system is based on image processing, which consists of capturing an image of the object comparing it with the images stored in the database, and identification of objects. For doing this, Tensor flow algorithm is used and the accuracy obtained is more than 90%. The second part of the project is the segregation of the fruits/vegetables and cutting them depending on the requirement.

**Full paper: Evolutionary Computing and Mobile Sustainable Networks, Lecture Notes on Data Engineering and Communications Technologies, ISSN 2367-4512, Vol 53, 2020, pp 713-720.*

Perceptual Linear Prediction Feature as an Indicator of Dysphonia

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ABSTRACT

Voice is the most widely used form of communication in humans. The analysis of human voice is one of the areas that has been of great significance. This area is studied for its various applications in the field of medicine and engineering. The analysis in general deals with the extraction of some parameters of the voice signal for investigation and processing. A system that diagnoses the patients from their speech signals is proposed in this work. It includes detection and classification of certain common medical conditions which affect the voice patterns of the patients. The feature vectors of the speech samples are obtained by using perceptual linear prediction (PLP) and relative spectral transform perceptual linear prediction (RASTA–PLP) feature extraction methods. The detection and classification of voice pathology are done by using the support vector machine (SVM) classifier. The accuracy of the classifier is computed using speech samples of gastroesophageal reflux disease (GERD) and vocal fold paralysis from the pre-classified database.

**Full paper: Advances in Control Instrumentation Systems, Lecture Notes in Electrical Engineering, Editors V. I. George, B.K. Roy, July 2020, Manipal, pp 51-64*

A Comparison between Power Spectral Density and Wavelet Transform for EEG-based Sleep Onset Detection

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ABSTRACT

In many neurological studies, the study on brain activity with respect to the continuous evaluation on the work of safe driving has received noticeable attention. The Electroencephalogram (EEG) is a non-invasive physiological device that measures brain activity. Brain signals analysed using electroencephalography can help in the prediction of the drowsiness in drivers. The proposed work is to establish a simple and precise sleep onset prediction method based on EEG signals acquired from a single-channel electrode. These EEG signals are processed using two different methods, Fast Fourier transform and Discrete Wavelet Transform. Distinct features are extracted from both processing methods separately, and are used as training data set to train the classification models in MATLAB classification learner. A comparison has been made between the processing methods to evaluate which of the two method gives better accuracy. According to the obtained results, models trained using wavelet transform features gave an accuracy of 98%. Among the models trained, decision tree is the most accurate model having the fastest prediction speed, approximately up to 30000 observations/second.

**Full paper: Fifth International Conference on Information and Communication Technology for Competitive Strategies, Jaipur, 11th – 12th December 2020.*

The Mechanism to Combat Data Leakage Trojans in Circuits using Ranomized Encoding

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ABSTRACT

For any system dealing with data, security is an essential factor. With increasing manufacturing and production costs, many companies rely on external facilities. There is a chance of Trojan insertion in such a situation. In the paper, the Randomized Encoding of Combinational Logic for Resistance to Data Leakage (RECORD) technique is explored. Data randomization is carried out in this technique that renders the leaked data useless in the event of a Trojan attack. The percentage of randomization and recovery obtained is taken into consideration to assess the design efficacy. Design analysis on combinational circuits for a given set of inputs provided randomization of 50% and efficient data recovery. The design study of the RECORD method when extended to sequential circuits provides randomization of 40% and 100% recovery for an appropriate sequence of random bit change at every clock cycle.

**Full paper: IEEE International Conference on Distributed Computing, VLSI, Electrical Circuits and Robotics (DISCOVER-2020), DOI: 10.1109/DISCOVER50404.2020.9278102, Shri Madhwa Vadiraja Institute of Technology & Management, Udupi, 30th- 31st Oct 2020, pp 230-235.*

Automated Rubber Tree Tapping and Latex Mixing Machine for Quality Production of Natural Rubber

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ABSTRACT

Rubber plantation is one of the main plantation crops in some regions of India. Due to the unavailability of skilled laborers, increased labour charges and low income from rubber plantations discourage the planters to continue with this crop. Rubber tapping is the process of extraction of latex from rubber trees. On a typical day, the tapper has to tap about 500 to 800 rubber trees manually with a tapping tool within a specified time of the day. The paper proposes the construction of the semi-automated rubber tapping machine which safeguards the rubber tree from manual damage happening during the taping. After extracting rubber latex from the tree, it has to be mixed with other solvents for quality rubber sheet production. Manual mixing is time-consuming and it requires skilled laborers. This kind of mixing sometimes causes wastage of rubber sap and also may produce poor quality of rubber sheets. An automatic machine performing the mixing process by measuring dry rubber content (DRC) in concentrated natural latex is presented in this paper. The mixing process requires solutions like latex, water and dilutes acid. Based on the DRC level of rubber latex, water is mixed in a ratio with the aid of controlling device and then mixed solution is poured to the dishes for further process. The system is aimed at assisting rubber planters in the mixing process thereby improving the quality of the rubber sheet.

**Full paper: IEEE HYDCON - International Conference on Engineering in 4th Industrial Revolution (EI4.0), Hyderabad, 9th- 12th September, 2020.*

A 1.1mA Low Drop-Out Voltage Regulator for System on Chip Applications using 0.18µm CMOS Technology

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ABSTRACT

Mobile phones require linear voltage regulators with low drop-out, high PSRR, cost efficient and low ground current. They need to pass steady output under all load conditions. Preferably, one gadget would have all these aspects and one low-dropout voltage regulator (LDO) could be utilized in a mobile phone. But in practice, the various mobile phone blocks are powered by LDOs with distinct performance aspects. The proposed LDO is processed in a standard 0.18µm CMOS process. The regulator can settle the output to a stable voltage within 3.7µs. The line regulation, load regulation and PSRR of the proposed regulator are 0.188% and 0.0755%, -54dB respectively.

**Full paper: International Conference on Convergence in Technology, DOI: 10.1109/I2CT42 659. 2018.905780, Managlore, 09 April 2020.*

Analysis of Non-Line of Sight Vehicular Ad-Hoc Network

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ABSTRACT

The advances in wireless communication and the automobile industries have increased the significant interest in the field of VANETs. VANETs are the subset of MANETs. They rely on the Ad Hoc network communication that is peer-to-peer communication without any access points. Now the road accidents are alarmingly increasing despite the invention of several in built safety sensors or devices such as proximity sensors, touch sensors, smoke sensors, speed sensors, oxygen sensors, anti-locking braking system, seat belts, airbags etc. In this paper an attempt is made through simulation communication of Multiple Road Side Units has been simulated and the analysis of Packet Delivery Ratio, End-to-End Delay, Energy and Throughput are obtained.

**Full paper: International Conference on Automation, Signal Processing and Energy System, 2020.*

A Comparative study of XOR-XNOR using 18nm FinFET Technology

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ABSTRACT

There is increase need of low power devices for mobile and medical devices. All digital devices is in need of computation module of an adder. In adder XOR is the most resource hunger gate. In this paper an attempt was made to compare different XOR-XNOR gates. The gates were designed using 18nm FinFET technology. The operation of gates was verified using FO2,FO4 and FO8 loads. Among the comparison circuit A shows power delay product (PDP) of 0.330 fJ for FO2 with supply voltage of 0.35 V.

**Full paper: International Conference on Automation, Signal Processing and Energy System, 2020.*

Design and Implementation of 64-bit Parallel Prefix Adder

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ABSTRACT

Binary addition is a commonly used application in computational arithmetic. Adders are the basic building blocks of the various computational structures leading to wide applications in Digital Signal Processing, arithmetic, and logical units, microprocessors, and microcontrollers. Research on adders with optimal specifications is continuously carried out. The delay of an adder depends on the speed of the carry bit to reach the next bit position for addition. In this paper, we introduce and discuss a fast 64-bit parallel prefix adder design. The proposed novel design uses the advantage of the Ling adder design needed to suppress the area requirement and increase the computation speed compared to the existing algorithms. With a moderate increase in area and power, the adder gives a quality critical path delay of 21.9ns. The structure is coded using Verilog HDL, simulated, and implemented with the Xilinx Vivado tool.

**Full paper: Proceedings of the IEEE International Conference on Distributed Computing, VLSI, Electrical Circuits and Robotics (DISCOVER-2020), DOI: 10.1109/DISCOVER50404.2020.9278102, Shri Madhwa Vadiraja Institute of Technology & Management, Udupi, 30th- 31st Oct 2020, pp. 159-164.*

Effectiveness of Collaborative Learning among Gen Z Engineering Students

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ABSTRACT

Collaborative learning helps to get the most out of students' academic as well as intellectual capabilities by engaging a team of students in self-regulated learning activities under the supervision of course coordinators. At the swipe of a screen, Generation Z (Gen Z) has the solutions to every problem. The need to promote interactive and productive learning and to cater to the needs of current Generation Z (Gen Z) engineering students, collaborative learning is considered to be one of the most profound approaches which can be incorporated in the teaching and learning process on the campuses.

The aim of this research is an attempt to understand the engineering students' insights towards collaborative learning and its effectiveness. The study population of this action research is the second-year electronics and communication engineering students (N=60; males=33; females=27) on a core course at St Joseph Engineering College, Mangaluru, Karnataka, India. They were selected on the basis of their performance in the previous test. The collaborative activity was conducted in two phases. Six Thinking Hats activity was adopted for collaborative learning activity. A detailed research design with a structured questionnaire has been used to measure the effectiveness of the activity. Collaborative learning is found to be an effective method in enhancing learning among Gen Z engineering students, with a positive or relation between collaborative learning and student performance and the assessment parameters of the presentation indicate that the students participated actively.

Full Paper: Journal of Engineering Education Transformations, ISSN 2349-2473, eISSN 2394-1707, Vol 34, Issue No. 3, January 2021, pp 70-78.

The Real-Time Mobile Application for Identification of Diseases in Coffee Leaves using the CNN Model

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ABSTRACT

Coffee plants are extremely susceptible to a wide range of pests and diseases. Usage of reckless pesticides can lead to increased pathogen resistance in the long run, severely limiting coffee plants' ability to fight. Plant health monitoring and disease detection in plants are very critical for sustainable agriculture. As there is a rapid rise in the number of diseases and low awareness of these conditions, disease detection and prevention remain a major concern. Coffee leaves have certain textures and visually striking similarities that can be used to identify the disease type. The proposed solution is used to detect coffee leaf diseases and classify them into five categories: healthy, diseased leaves with Brown eye spots, Coffee Leaf Blight, Coffee Leaf Rust, and Coffee Leaf Miner. The paper focuses on building a CNN model which processes the leaf images that can be used for the detection of plant diseases with digital image processing techniques for disease diagnosis using visual image processing techniques. This solution serves its purpose by identifying and classifying the diseases based on the features derived from the Coffee leaf picture samples with an accuracy of 88.35%. With the aid of the above technique, coffee plant farmers may be able to identify diseases more quickly, increasing India's coffee production output. The proposed system was designed to benefit farmers and the agricultural sector, especially in the Karnataka region.

**Full Paper: Proceedings of the Second International Conference on Electronics and Sustainable Communication Systems (ICESC), ISBN: 978-1-6654-2866-8, IEEE Xplore, Coimbatore, August 2021, pp 1704-1710*

Classification of Seizure, Normal and Interictal Signals Using Different Classifiers

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ABSTRACT

The classification of brain data using machinelearning systems is a dominant tool in the recognition of braindisorders such as Epilepsy and Alzheimer's disease. Epilepsy is one of the main chronic neural disorders, which disturbs thesurvives of millions of patients. It takes place because ofexcessive or synchronous weird activities in the human brain.It is the highest common brain disease that has been spreadinglargely around the arena. One of the most frequently usedsignals is EEG. Electroencephalography (EEG) is anelectrophysiological monitoring procedure to record theelectrical progression of the brain. Automatic seizureprediction technology can automatically spot the EEG by usingan epileptic prediction algorithm which is helpful to find andtreat the epileptic disease. In the binary classification, thesystem has attained effective results with an average sensitivityof more than 98% for both interictal- seizure and normal-seizure signal classification. The specificity is greater than 93%and the average accuracy is more than 97% for the threedifferent classifiers.

**Full paper: International Journal of Science and Innovative Engineering & Technology (IJSIET), ISBN 978-93-81288-22-1, Vol 4 May issue, 2021*

A Review on Techniques of Radiation Dose Reduction in Radiography

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ABSTRACT

This document gives an insight on the methods followed to decrease the radiation dose in radiography. Risk of developing cancerincreases with frequent exposure to imaging diagnosing technologies like Xray and CT scan. Risk is twice in case of pregnant women and inchildren. Thus, reducing the radiation dose plays a vital role in protecting the public health. Radiation dose can be controlled through hardwareor software techniques. Different software algorithms are analyzed. Focus is to reduce the noise and enhance the clarity in image by using thereconstruction algorithms and filters, which in turn help the doctors to diagnose the patients with less radiation dosage.

**Full paper: Expert Clouds and Applications, Lecture Notes in Networksand Systems, 209, https://doi.org/10.1007/978-981-16-2126-0_53, pp 681-694*

Detecting and Classifying Epileptic Seizures by HOS Cumulants

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ABSTRACT

The nervous system disorder outcomes the mortal condition called epilepsy. It is the utmost universal brain illness that has been scattering chiefly about the field. The human brain's excessive weird activity causes these disorders. Disease affliction was raised to a major Status by seizure irregularity. Seizure onsets recognition system would authorize patients to take security methods. Brain electrical progression Recording is done by an electro physiological monitoring system called Electroencephalography (EEG). EEG readings abnormalities caused by Epilepsyare mostly identified by EEG. Long- term EEG recording so fan Epileptic patient contain a vast amount of EEG data. The requirement of testing the EEG's entire length for the epileptic prediction is a demanding process. If well-handled and diagnosed, 70% of epilepsy Individuals can stay free from seizures.

**Full paper: International Conference on Artificial Intelligence, AITA 2021, NIT, Patna, December 2021.*

Low-Cost Wearable Asthma Monitoring System with a Smart Inhaler

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ABSTRACT

Asthma is a lifetime chronic disease that leads to abnormality of lung functions and difficulty in breathing. It is one of the most widespread chronic diseases which causes breathing problems and abnormal functionality of the lungs. It is a condition where the airways tend to swell and produce excess mucus. The symptoms of asthma include shortness of breath, tightness in the chest, wheezing sound when breathing specifically found in kids, tiredness, etc. It has been observed that cases of asthma are increasing day by day due to pollution in the air and exposure to unfavorable conditions. This proposed health monitoring system continuously monitors the patient's heartbeat and his/her external environment conditions. The system includes sensors to sense all the external parameters like humidity, heartbeat, smoke, and temperature; it will also measure the temperature of the person wearing the band. All these parameters will be sensed and are uploaded to the cloud server which is accessible to the doctor and caretaker through an application. An alert message is also sent to the patient if the system detects an unfavorable asthmatic environment. This helps the patient to keep track of his asthma and avoid an unnecessary asthmatic attack. Both the monitoring device and smart inhaler focuses on the treatment of asthma by improving overall lung function, reducing daily symptoms and preventing acute asthma attacks.

**Full paper: Asian Conference on Innovation in Technology (ASIANCON), IEEE, Pune, 27-29 August 2021*

Optimal Path Discovery for Two Moving Sinks with a Common Junction in a Wireless Sensor Network

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ABSTRACT

A new algorithm is described for determining the optimal round-trip paths for two moving sinks in a wireless sensor network. The algorithm uses binary integer programming to select two non-overlapping shortest paths except having a common junction node to cover all the sensor nodes. The two paths are balanced as nearly equal as possible. That is the sensor nodes along each path are equal or differ by just one depending on whether the total number of sensor nodes excluding the junction node is even or odd. In this method, both the path lengths are made equal or very nearly equal while the total length is minimized. This integrated approach is a novel and unique solution to solve the dual moving sink path problem in a wireless sensor network.

**Full paper: Indonesian Journal of Electrical Engineering and Computer Science, ISSN: 2502-4752, DOI: 10.11591/ijeecs.v23.i2, Vol. 23, Issue No. 2, August 2021, pp. 879~889*

Design of Multipliers for Moduli $(24k+22k+1-23k+1-2k+1)$ and $(24k-23k+1+2k-1)$

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ABSTRACT

In this paper, the design of modulo multipliers for the moduli $(24k+22k+1-23k+1-2k+1)$ and $(24k-23k+1+2k-1)$ is investigated. These moduli are useful for constructing four moduli sets with interesting properties resulting in simpler RNS to binary conversion architectures. The derived architectures of the multipliers can facilitate binary to RNS conversion as well. Hardware requirements and multiplication time are derived in tems of basic gates and ASIC implementation results are presented.

**Full paper: International Conference on Circuits, Controls and Communications (CCUBE), DOI: 10.1109/CCUBE53681.2021.9702727, IEEE, Bangalore, 23-24 December 2021*

Automated Ration Material Distribution System

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ABSTRACT

Ration shops in India are used to distribute commodities such as wheat, rice, sugar etc., to the public at a lower price than the market price. In order to buy the materials from the ration shop, people have to first submit their ration card and then they will be issued the materials through weighing system with the help of man power. The current ration distribution system is a controversial issue that involves corruption and illegal smuggling of goods. There is no technology being developed for the automation of the ration distribution, all the tasks are hand-operated manually leading to irregularities in the system. In this work an attempt is made to automate theration materials distribution. A system is developed based on the GSM technology. This system is simple and uses aadhar card for customer identification instead of the ration card. In the system, ration materials like sugar, rice, and wheat are distributed through an automatic mechanism without any help from the humans. The advantages of the system are it overcomes flaws such as inaccuracy in weighing the weight of the materials due to human error, data accuracy, and unauthorized data entry.

**Full paper: 5th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques, IEEE Conference, Mysuru, 10-11 December 2021*

Dual-Scan Architecture for 2D Discrete Wavelet Transform Using Modified Lifting Algorithm

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ABSTRACT

An efficient architecture of discrete wavelet transform (DWT) in two-dimension (2D) is presented in this paper. The proposed structure has a higher hardware efficiency and better performance than the other DWT structures. The conventional lifting scheme is modified to reduce the latency and critical path to one multiplier delay ($1T_m$). The processing speed of the architecture is increased by introducing four pipeline stages in the DWT structure. Cohen-Daubechies-Feauveau (CDF) 9/7 wavelet filter is implemented in the paper. The data scanning of the input image for processing is done in Z-fashion. The computation time of an $N \times N$ image is $N^2/2$ and the temporal buffer requirement is $4N$. The DWT architecture developed based on the modified lifting scheme has a regular data flow with a throughput rate of two. Very high speed hardware description language (VHDL) is used to describe the digital design. The architecture is implemented on CADENCE tool with CMOS 180 nm technology. The results after comparison indicate that the proposed architecture is hardware efficient and memory utilisation is reasonable as a result of which this structure can be used in real-time image and video compression.

Full paper: International Journal of Systems, Control and Communications, Vol.12, Issue No.4, 2021, pp.327 – 339

Design and Implementation of 64-bit SRAM and CAM on Cadence and Open Source Environment

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ABSTRACT

Low-power IC design has become a priority in recent years because of the growing proliferation of portable battery-operated devices, bringing Static Random-Access Memory (SRAM) and Content Addressable Memory (CAM) into play. In today's SoCs, embedded SRAM units have become a necessary component. There is a lack of chips in the current world and to manufacture chips there is the requirement of Electronic Design Automation (EDA) tools that can perform better. In this paper, the main motive is to showcase the performance of open-source tools available currently which can still generate the required output with no cost. In this new era of fast mobile computing, traditional SRAM cell designs are power-demanding and underperforming. Rather than lowering manufacturing costs through high-volume production, specialty memory give cost-effective alternatives through architecture. Specialty memory devices enable the designer to address issues like board area, important timing, data flow bottlenecks, and so on in ways that high-volume regular memory devices cannot. Implementation of memory devices on Cadence environment and open-source environment to check the compatibility and compare the power, area, and delay of both 64-bit SRAM and CAM also analysing and validating the results of both the memory devices in this paper. For SRAM in a cadence environment, the calculated power, area, and slack have improved values, namely 0.145mW, 1104.3µm2, and positive slack of 6636 for pre-layout analysis. Furthermore, the power for 64-bit CAM in a cadence context is nearly identical to those for an open-source environment ~0.8mW. In an open-source environment, the calculated slack for CAM is 4.74.

**Full paper: International Journal of Circuits, Systems and Signal Processing, Vol 15, July 2021, pp 586-594*

Performance Enhancement of a Hybrid AC-DC Micro Grid Operating with Alternative Energy Sources Using Super Capacitor

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ABSTRACT

Microgrids with non-conventional energy sources have become popular recently. Hybrid AC-DC microgrid (HMG) architecture is effectual as it avoids several power conversions for the consumers. Therefore, this article presents a comprehensive study on grid-tied HMG with PV array and wind energy conversion system (WECS) as principal sources. Fuel cell (FC) acts as the auxiliary source in the DC subgrid and the supercapacitor (SC) is used for instantaneous energy management. The hydrogen storage system is used to store surplus power produced by the PV array. The power flow between the subgrids is regulated using the interlinking converter (ILC) by a PQ controller. The main contribution of this article is the comparative investigation of system operation in the HMG configuration in the presence and absence of a supercapacitor bank on the DC bus. The maximum DC bus voltage fluctuation during load variations in the absence and presence of SC bank is found to be 6.6 V and 3.9 V respectively. Similarly, the maximum transient fluctuation in the power supplied to the DC load is found to be 830 W in the absence of SC bank and 340 W in the presence of SC bank.

**Full paper: International Journal of Electrical and Computer Engineering Systems, DOI:https://doi.org/10.32985/ijeces.12.2.1, Vol. 12, Issue No. 2, 2021, pp 67-76*

Approximation Algorithms for Profit Maximisation in Multicast D2D Networks

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ABSTRACT

As the demand for mobile data services increases, telecom companies need to develop wise strategies to retain existing customers. For instance, in a multicast scenario, satisfying individual user's quality of service (QoS), data demand at varying rates, etc. are complicated tasks. Earlier works on device-to-device (D2D) multicast have majorly discussed the cases of throughput maximisation without considering the individual user's data request rates. In this paper, we propose two algorithms to maximise the telecom operator's profit collected from the users in a two-hop D2D multicast network, when users have different channel qualities and data request rates while receiving multicast data through a single transmission session. First, we model our multicast scheme for the proposed scenario as a budgeted maximum coverage problem. Later, we propose two approximation algorithms that guarantee approximation ratios of $1-1/\sqrt{e}$ and $1-1/e$, respectively, where e denotes the base of the natural logarithm. Numerical results show that the proposed algorithms perform better than the other candidate algorithms and nearly approximates the optimal solution.

**Full paper: International Journal of Ad Hoc and Ubiquitous Computing, DOI:10.1504/IJAHUC.2021.112979, Vol.36, Issue No.1, 2021, pp.8 - 19*

6G Ecosystem: Current Status and Future Perspective

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ABSTRACT

Next-generation of the cellular network will attempt to overcome the limitations of the current Fifth Generation (5G) networks and equip itself to address the challenges which become obvious in the future. Currently, academia and industry have focused their attention on the Sixth Generation (6G) network, which is anticipated to be the next big game-changer in the telecom industry. The outbreak of COVID'19 has made the whole world to opt for virtual meetings, live video interactions ranging from healthcare, business to education. However, we miss an immersive experience due to the lack of supporting technology. Experts have anticipated that starting from the post-pandemic age, the performance requirements of technology for virtual and real-time communication, the rise of several verticals such as industrial automation, robotics, and autonomous driving will increase tremendously, and will skyrocket during the next decade. In this manuscript, we study the latest perspectives and future megatrends that are most likely to drive 6G. Initially, we describe the instances that lead us to the vision of 6G. Later, we narrate some of the use cases and the KPIs essential to meet their performance requirement. Further, we highlight the key requirements of 6G based on contemporary research such as UN sustainability goals, business model, edge intelligence, digital divide, and the trends in machine learning for 6G.

**Full paper: IEEE Access , DOI: 10.1109/ACCESS.2021.3054833, Vol 9, 26 January 2021, pp 43134 - 43167*

Impact of Project-Based Learning on Entrepreneurial and Social Skills Development

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ABSTRACT

The management and entrepreneurship subject in the engineering curriculum is the most imperative at the same time overlooked subject when it comes to experiential learning. Therefore, it was realized that there is a need to bring up some innovations concerning course content delivery strategies and assessment to improve the entrepreneurial and social skills among the students. The purpose of this study is to find the impacts of project based learning and identify all factors that influence our students to get succeed. This exposed students to numerous opportunities to learn how to think critically and analyze the ideas on board. The flip classroom is used to describe the concept, and Project-Based Learning served as a tool for the students to develop their Entrepreneurial Skills. These strategies helped the students to continue learning on the topic further. They discovered various job opportunities, career paths they thought of or known existed. This type of instructional method repurposed the class hours for an inquiry which was beneficial for students to learn better. The pedagogical practices which are discussed here were found to be the most effective ones when compared with conventional classroom teaching and in terms of student's involvement in learning. It is perceived that to unleash our students' entrepreneurial skills, curricula must include outcomes that enable lifelong learning and encourage inquiry beyond the classroom rather than only defining measurable learning outcomes. The current research motivated the students to submit business plans for startups.

**Full paper: Journal of Engineering Education Transformations, eISSN 2394-1707, Vol 34, Special issue, January 2021, pp 593-598*

ELECTRICAL AND ELECTRONICS ENGINEERING

Comparison of Selective Harmonic Elimination for Reduced Number of Switch Asymmetric Multilevel Inverter

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ABSTRACT

A multilevel inverter topology with reduced number of switches has been used for the selective harmonic elimination technique in order to identify the optimal switching angles. The proposed multilevel inverter is an asymmetric multilevel inverter and uses fundamental frequency pulse width modulation and can produce high level of output voltages. In this paper performance analysis of a 19 level asymmetric single-phase Multilevel Inverter with reduced number of switches is discussed. The analysis is carried out using traditional technique such as Newton Raphson method (NR), bioinspired Genetic Algorithm (GA) and the nature - inspired Antlion Optimization algorithm (ALO). The Percentage Total Harmonic Distortion (% THD) is compared between NR, GA and ALO. ALO algorithm performs better in terms of convergence and % THD.

**Full paper: International Journal of Advanced Research in Engineering and Technology (IJARET), DOI: 10.34218/IJARET.11.6.2020.09, Vol. 11, Issue No. 6, June 2020, pp. 1012-1023.*

Optimal Sizing, Placement and Performance Analysis of DSTATCOM with Improved Controller without Current Sensors

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ABSTRACT

The performance analysis of Distribution Static Compensator (DSTATCOM), when it is placed in an optimized location with an improved controller without current sensors is presented in this paper. To obtain optimal location, Ant colony optimization technique is used for the placement of DSTATCOM. To incorporate this compensator in load flow analysis, the modelling is done and rating of DSTATCOM is obtained. The performance analysis of improved controller is presented after placing the DSTATCOM in optimized location with optimized size. The actual voltage at bus where DSTATCOM is placed and DC voltage of the converter is taken as control parameters. The proposed optimization placement technique is tested for 207 bus practical distribution system using MATLAB. The performance analysis of studied systems with controller for different operating scenarios such as sag, swell are investigated in MATLAB/SIMULINK software environment.

**Full paper: Proceedings of the International Symposium on Devices, Circuits and Systems (ISDCS), 3-5 March 2021, Higashihiroshima, Japan, pp. 1-4*

Performance Enhancement of a Hybrid AC-DC Microgrid Operating with Alternative Energy Sources Using Super Capacitor

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ABSTRACT

Microgrids with non-conventional energy sources have become popular recently. Hybrid AC-DC microgrid (HMG) architecture is effectual as it avoids several power conversions for the consumers. Therefore, this article presents a comprehensive study on grid-tied HMG with PV array and wind energy conversion system (WECS) as principal sources. Fuel cell (FC) acts as the auxiliary source in the DC subgrid and the super capacitor (SC) is used for instantaneous energy management. The hydrogen storage system is used to store surplus power produced by the PV array. The power flow between the subgrids is regulated using the interlinking converter (ILC) by a PQ controller. The main contribution of this article is the comparative investigation of system operation in the HMG configuration in the presence and absence of a super capacitor bank on the DC bus. The maximum DC bus voltage fluctuation during load variations in the absence and presence of SC bank is found to be 6.6 V and 3.9 V respectively. Similarly, the maximum transient fluctuation in the power supplied to the DC load is found to be 830 W in the absence of SC bank and 340 W in the presence of SC bank

**Full paper: International Journal of Electrical and Computer Engineering Systems, Vol. 12, Issue No. 2, 2021, pp 67-76.*

Refined Assessment Technique in Engineering Education Based on Response from Stake-holders

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ABSTRACT

In recent literature on Engineering Education research, a significant amount of knowledge is shared on the effective design of Holistic and Analytic rubrics for Assessment. Although the designed rubrics are shared with the students, fair and consistent assessment of student performance cannot be ensured since the rubrics designed by the course instructor have not been validated by stake-holders like students from the previous batch who have taken the course, Alumni, and Industry. This study explores the refinement techniques for redesigning the assessment rubrics. The paper puts to test an Analytical rubric by taking relevant feedback from the stake-holders. The method of survey-based statistical analysis was adopted in redesigning the rubrics. A total of 188 students were asked to take up this survey. These participants included 70% of students from the Undergraduate Engineering background, 20% Alumni, and 10% industrial stake-holders.

The findings of the survey and the ensuing statistical analysis prove that the stake-holders can actively take part in redesigning assessment rubrics by giving valuable feedback on rubrics criteria which are judgmental, qualitative and can lead to an inconsistent assessment of student performance. The survey was aimed at redesigning rubrics for assessment of online written assignments during the COVID crisis period. It was observed that the majority of students agreed with the quantitative criteria of the rubrics. Valid suggestions given by students on improving the qualitative criteria were incorporated in the new design.

**Full paper: Journal of Engineering Education Transformations, Vol 34, Special issue 1, 2021, pp 112-115*

Impact of Collaborative Learning in Electrical Engineering Education

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Electrical Engineering Education needs the students to have prior knowledge of mathematical tools and analytical skills which warrants the need for collaborative learning. This paper explores the impact of collaborative learning strategies on the academic performance of students in electrical and electronics engineering. The purpose of this paper is to assess the learning of students in courses with a high quotient of analytical thinking and reasoning. The objective is to enhance the learning of students through creative and collaborative activities designed to ignite young minds. Homogeneous groups were formed and instructions related to collaborative activity were read out in class and made available on the learning management system. Students are given five to eight days for submission of results, interim evaluation, and preparation of presentation which is assessed based on published rubrics. The impact of collaborative learning strategies discussed in this paper is targeted towards the positive growth of individual students acquiring technical and managerial skills. The technical training conducted for students necessitates them to have prerequisite knowledge of foundation courses. It is observed that the students who have experienced collaborative learning methods have performed better during technical training. The collaborative activities have shown a positive response from students in the classroom and their performance in exams has improved. Group activities like chart-making, case-based learning, project-based learning and role play exercise can be planned for few topics in any engineering course design to ignite young minds towards technical topics discussed in theoretical courses with no practical content.

Full paper: Journal of Engineering Education Transformations, Vol 34, Special Issue 1, 2021, pp 116-120

MECHANICAL ENGINEERING

Effective Deployment of Outcome Based Education: Strategies based on Motivational Models

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ABSTRACT

The very purpose of the article was to discover the effective deployment strategy for Outcome Based Education (OBE). The article addresses one of the affective domains (motivation) of Blooms Taxonomy in implementing the OBE. The Maslow's motivational model and ARCS motivational model was used to complement each other in the deployment of the outcome-based system. Two sections of a course were considered in the research design having same subject of study, syllabus and assessment methodology to compare and culminate the findings of old and new approach. Root-cause analysis was used to initiate there search where as statistical analysis was performed to culminate the findings. The new deployment strategy based on motivational theories proved to be superior in the outcome of the course. The current research was unique and adds value to body of knowledge by paving the way forward for new opportunity for engineering education research among the academicians, researchers, and policy makers.

**Full paper: Journal of Engineering Education Transformations, eISSN 2394-1707, Vol 33, Special issue, January 2020, pp 167 - 169.*

Lean Six Sigma for the Healthcare Sector: A Multiple Case Study Analysis from the Indian Context

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ABSTRACT

Purpose – The purpose of this paper is to explore the voice of the customer, key performance indicators, critical to quality characteristics, critical success factors, and commonly used tools and techniques for deployingthe Lean Six Sigma (LSS) strategy in Indian private hospitals, with special attention to the medical records.

Design/methodology/approach – The study utilizes the action research methodology to obtain a greaterunderstanding of the use of LSS in the Indian healthcare sector. Multiple case studies were designed andsuccessfully deployed to understand and ascertain challenges in LSS implementation. Five case studies werecarried out in the Medical Records Departments (MRD) of four private hospitals in India.

Findings – Patients perceive that waiting in queue harms their health, which can be rectified by addressingthe cycle time of the system. The research also found that effective leadership, availability of data,involvement of cross-functional team and effective communication are critical to the success of LSS projects.In addition, control charts, cause and effect diagram, 5S, gemba, two-sample t-test, standardization, wasteanalysis and value stream mapping are some of the common tools used to improve healthcare systems.

Research limitations/implications – The research was restricted to studying the impact of LSS on theworkflow and resource consumption of the MRD in Indian allopathic hospitals only. The validity of theresults can be improved by including more hospitals and more case studies from the healthcare sector indifferent countries.

Originality/value – The findings will enable researchers, academicians and practitioners to incorporate theresults of the study in LSS implementation within the healthcare system to increase the likelihood ofsuccessful deployment. This will provide greater stimulus across other departments in the hospital sector forwider and broader application of LSS for creating and sustaining process improvements.

**Full paper: International Journal of Quality & Reliability Management, Vol. 37,Issue No. 1, 2020, pp. 90-111.*

Collaborative Learning for Outcome Based Engineering Education: A Lean Thinking Approach

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ABSTRACT

Background, Motivation, and Objective – Inculcating critical thinking, teamwork, and lifelong learning are the basic tenets of Outcome Based Engineering Education (OBEE). Collaborative learning is one such pedagogy of engagement to achieve the same. In addition, the implementation of OBEE demands the adoption of corporate best practices in deploying new initiatives, which streamlines the process, removes waste in the process, and ensures sustainment of the improved process. Lean Thinking is one such approach adopted by the industry to ensure productivity, performance, and sustainment of new initiatives. The objective of this paper is to study the scope of collaborative learning in OBEE based on the Lean Thinking approach, and to explore its successful deployment in Indian higher education.

Statement of Contribution/Methods – The research reported in this paper is based on Action Research methodology carried out using the Lean Thinking PDCA (Plan-Do-Check-Act) approach and its application in improving OBEE through collaborative learning in India. STAD (Student-Teams-Achievement-Division) collaborative learning was deployed through heterogeneous group formation for enhancing the teaching-learning process. The Indo-Universal Collaboration on Engineering Education (IUCEE) consortium knowledge base and assistance has been effectively used to chalk out the strategy for effective deployment. Basic statistics and outlier analysis is used to draw the inferences.

Results, Discussion, and Conclusions – The study describes the effective deployment of collaborative learning to enhance the effectiveness of the OBEE ecosystem through students" performance by utilizing the power of Lean Thinking. The study shows that not only Turn-Around-Time (TAT) of the deployment process is enhanced, but also the attainment of the students performance. Moreover, it improves team spirit and team performance during the process. The paper is based on a single case study executed in an engineering college and hence, there is limitation in generalizing the specific results from the study. But the approach adopted and the learning from this study can be generalized. The study is of use to academicians, researchers, practitioners, and policymakers seeking to implement collaborative learning for an OBEE set- up with optimal utilization of the available resources based on the Lean Thinking platform in their organizations. This approach ensures value-added activity throughout the process and effective utilization of industrial best practices to higher education. Although collaborative learningand Lean Thinking have been extremely successful in the education sector and the corporate sector, respectively, the application of both to the engineering education has been limited.

Full paper: Journal of Procedia Computer Science, Vol. 172, (2020), pp 927–936.

Influence of Epistemic Curiosity on the Study Approaches of First Year Engineering Students

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ABSTRACT

Epistemic Curiosity is a trait that drives students to engage in learning and intellectual activities. This paper presents the results of a pilot study conducted to validate the hypothesis that epistemic curiosity levels influence the study practices of students. Understanding the relationship between epistemic curiosity and students study processes will enable teachers to design teaching learning interventions that promote student motivation and engagement. This study uses available instruments of measuring epistemic curiosity and correlates it with the study approaches of first year engineering students. The I and D type epistemic curiosity scales are employed to measure the epistemic curiosity levels of first year engineering students. The study approaches are identified using the Revised Study Process Questionnaire (R-SPQ), which measures the tendencies of students to engage in deep or surface level learning motives and strategies. Results reveal that I and D type epistemic curiosity levels correlates positively with deep learning motives and strategies, and correlates negatively with surface learning motives and strategies. It is also observed that D-Type epistemic curiosity levels correlates more strongly with deep approach, than I-Type epistemic curiosity. The correlation of D-Type EC with deep strategies was higher in comparison to deep motives. Results also reveal a higher I-Type disposition of epistemic curiosity in comparison with D-Type, among first year engineering students. Overall, the study validates the hypothesis of using epistemic curiosity levels as an effective tool in monitoring the study approaches of first year engineering students.

**Full paper: Journal of Procedia Computer Science, Vol. 172, 2020, pp 443–451.*

Application of Robust Engineering Approach for DC Motor Controller Design

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ABSTRACT

This article presents the application of robust engineering to the design of a controller for DC motor application. The objective of the research is to control the speed of the DC motor using robust engineering approach. The Taguchi's Robust Engineering approach is used to design controllers for DC motors. The initial range of the controller is identified using the Internal Model Control approach. Both, noise and control parameters, are accommodated in the experimentation. The optimal value of the Proportional-Integral-Derivative (PID) controller derived from the Taguchi Robust Engineering resulted in faster settling time. The Internal Model Control (IMC) based PID design approach and the Taguchi- based PID design approach for controllers are compared for both nominal plant models along with ±10% uncertainty in all the process parameters. The results prove the effectiveness of the robust engineering to design a DC motor controller using Taguchi method. Eventually, a regression equation is proposed based on the results of the study to facilitate academicians and researchers to delve deeper in the field.

**Full paper: International Journal of Advanced Science and Technology, ISSN: 2005-4238, Vol. 29, Issue No. 7, 2020, pp 11275-11282.*

Production Enhancement and Sustainment through Lean Six Sigma Strategy

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ABSTRACT

The purpose of this article is to ascertain Key Performance Indicators (KPI) and Critical Success Factors (CSFs) to enhance and sustain production in a Small Scale Industry through the Lean Six Sigma (LSS) Strategy. The paper delineates a case-study in a step-by-step manner based on LSS strategy with minimum financial investments and optimum utilization of the available resources. The Define-Measure-Analyze-Improve-Control (DMAIC) methodology is adopted bythe research to deploy the LSS strategy. Statistical software MINITAB is used to interpret the result. The research will help to enhance the baseline status from 50,000 to 10,000 parts per million opportunities. This will subsequently assist in the reduction of wastes and enhance productivity. The rework of the gap between the leaf plate assembly, which was of major concern to the industry is reduced. The project is limited because the findings are based on a single case study and cannot be generalized. But, the methodology, lessons learned, and managerial inferences can be extended to similar industries. The research unearths that even novice users and industries can successfully deploy LSS methodology through a streamlined approach and reap the rewards in time.

**Full paper: International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) ISSN (P): 2249–6890; ISSN (E): 2249–8001, Vol. 10, Special Issue, Jun 2020, pp 376–384.*

An Experimental Study on Coconut Fibre Reinforced Concrete with Partial Replacement of Fine Aggregate by Plastic Waste

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ABSTRACT

This project gave us an idea of how we cause naturally available raw materials like coconut fibresto increase the tensile strength of the concrete and also partially replace fine aggregates by plastic waste and obtain an economical and eco-friendly concrete. Also the concrete obtained with optimum usage of coconut fibres and plastic waste is workable and can be employed in the future. In this experimental study, coconut fibres in the range of 2.5%, 5% and 7.5% was added to the concrete and fine aggregate was replaced by 5%, 10% and 15% of plastic waste for M-20 grade concrete. The various tests like slump test for determining the workability and tensile strength test and compressive strength test were carried out. The results show that increase in coconut fibre percentage increases strength and decreases workabilty, whereas, increase in plastic waste decreases strength as well as workability. The optimum strength was obtained for concrete with 7.5% addition of coconut fibre by mass of cement and 5% replacement of fine aggregate by plastic waste.

**Full paper: International Research Journal of Engineering and Technology (IRJET), e-ISSN: 2395-0056, Vol 07, Issue No. 6, June 2020, pp 6224 - 6230.*

A CAE-Based Methodology for Designing a Fuel Cell Stack for Electric Vehicle Applications

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ABSTRACT

Battery powered electric vehicles which can be considered as affordable for a common buyer suffer from severe range limitation and have a substantial charging time which are preventing such vehicles from competing with or replacing current internal combustion engine-based vehicles. An electric motor-propelled vehicle powered by a hydrogen fuel cell for generating electricity appears to be the only functionally viable solution which has zero emissions and can yet outperform conventional vehicles in terms of driving range with a refuelling time which can be comparable to those vehicles. However, the large-scale usage of fuel cells has been stymied by their high cost coupled with insufficient infrastructure for hydrogen production and distribution, and the potential risk of carrying on-board extremely high pressure (of the order of 350-700 bar) hydrogen storage tanks in vehicles. One way to make a fuel cell stack more economical would be to optimize its design which can be achieved best by resorting to advanced Computer-Aided Engineering (CAE) techniques as implemented in a commercial multi-physics finite element analysis solver e.g. COMSOL. It is noted in this context that materials play a key role in the effective realization of a fuel cell comprising components such as gas diffusion layers, porous catalyst-coated electrodes and a solid polymer electrolyte membrane. Using the relevant physical and electro-chemical properties of the components mentioned as well as of hydrogen and oxygen, a multi-physics simulation has been carried out in the current study with the aid of COMSOL for predicting the experimental polarization curve of a single fuel cell. The single cell model is then expanded to two cells connected in parallel for scaling up the power of a fuel cell system. An approach is finally shown for arriving at the specifications of a fuel cell stack for powering an electric vehicle

**Full paper: International Journal of Advanced Science and Engineering, ISSN: 2349 5359, Vol.6, Issue No S2, 2020, pp 35-42.*

Numerical Investigation of Hydrogen Absorption in a Metal Hydride Reactor with Embedded Embossed Plate Heat Exchanger

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ABSTRACT

In this paper, a Metal Hydride (MH) reactor integrated with an Embossed Plate Heat Exchanger (EPHX) was studied for the first time for its hydrogen absorption rate and thermal performance. A detailed numerical analysis of the various flow-field designs in the EPHX such as parallel-type, pin-type, and serpentine types (vertical and horizontal) was performed. The serpentine flow-field EPHX presented better heat transfer and faster hydrogen storage ability. Also, it showed more uniform temperature distribution in the bed compared with parallel and pin-type flow-fields. Next, the vertical-serpentine flow-field EPHX was compared with the most commonly used Helical Coil Heat Exchanger (HCHX) and the outcomes were discussed. Although, EPHX showed slightly lower overall heat removal from the reactor, it presented similar hydrogen absorption rate and remarkable uniformity in temperature distribution in the reactor.

**Full paper: Energy, Vol 194, Issue No. 11694233, 2020, pp. 1 - 11.*

A Study on Graphene Based Elastomer with Tio2 and Ni Nanoparticles

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ABSTRACT

Nanotechnology is a field of science that has wide range of potential applications in various sectors of engineering. By cutting down the size of a particle to nanoscale, its surface area to volume ratio will increase and more atoms or molecules are available to take part in chemical reaction. The mechanical, chemical, electrical and thermal properties of the polymers can be enhanced by incorporating nanomaterials as fillers. In this work, a polymeric nanocomposite has been prepared by incorporating fillers, reduced graphene oxide (r-GO), TiO2 nanoparticles and Ninanoparticles into an elastomeric matrix that is natural rubber (NR). r-GO is added to improve the mechanical strength and the thermal conductivity of the nanocomposite. Significant improvement in tensile properties (strength, Young's modulus and elasticity) has been observed during testing of samples prepared with various weight percent of r-GO, TiO2and Ni nanoparticles. Enhancement in the mechanical properties (yield strength increased by 94 %, tensile strength increased by 147 %) has been achieved with a composition of 1.25 weight percentage of r-GO and TiO2 nanoparticles. Similar improvement has been observed with composition of 0.1 weight percent of TiO2 and Ni nanoparticles into theelastomer at the same composition of r-GO.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007065, Vol. 2236, Issue No. 1, 20th May 2020, pp 040014-1 - 040014-7*

Recycling and Conversion of Waste PET Bottles into Acrylic Paints

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ABSTRACT

In this research work of Recycling of waste PET bottles, waste Polyethylene Terephthalate (PET) Bottles has been collected from local waste dumping areas in order to reduce the increasing trend in consuming plastic wastes (plastic pollution)which adversely affects wildlife and humans. These waste PET bottles is then processed (segregating and cleaning) and converted to fine plastic flakes. By glycolysis and hydrolysis process some part of plastic flakes is converted to binders with the addition of propylene glycol and zinc acetate. Remaining plastic flakes is subjected to hydrolysis and converted to suitable solvents. These solvent and binder in a certain proportion undergo a chemical reaction to form a low volatile acrylic paint which can be used for commercial purpose.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007730, Vol. 2236, Issue No. 1, 20 May 2020, pp 040019-1 - 040019-6.*

Effect of Using Fins in Cooking Vessel to Improve Heat Transfer Rate

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ABSTRACT

In this study an effort is made to reduce cooking time and fuel consumption by adding fins to the base of cooking vessel. Two types of design is tested here. One is hemispherical shape and the other is rectangular shape. Initially an unfinned vessel of 90 mm height and 170 mm base diameter is manufactured. Then two separate finned vessel is prepared for the same base dimension of unfinned vessel. Experiments are conducted by heating 1000 ml of water in all the three vessel and time taken to boil and fuel consumption data is recorded. Results prove that there is reduction in boiling time and fuel saving of 17% and 36% observed for hemispherical and rectangular finned shape respectively. Thus it is proved that fins are useful in increasing heat transfer rate by convection leading to saving in fuel consumption during the cooking process.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0006788, Vol. 2236, Issue No. 1, 20 May 2020, pp 030008-1 - 030008-6.*

Effect of Injection Pressure on the Performance and Emission Characteristics of Blends of Magnetite in Waste Cooking Oil Biodiesel on CI Engine

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ABSTRACT

In this research paper the effect of injection pressure is investigated on a nanofuel sample compared with its base fuel blend. Waste cooking oil methyl ester and diesel blend used are in the ratio of 20:80. Magnetite nanoparticles are dispersed in the B20 blend using a probe ultrasonicator. Base fuel B20 and nanofuel with 100 ppm of magnetite is tested and compared at three different injection pressures 200 bar, 220 bar and 240 bar. The results show that BTE increases by 1.3% when injection pressure is increased from 200 bar to 240 bar. BSFC reduces by 3.2% when injection pressure is increased from 200 bar to 240 bar. Among emissions, the NOx value shows a 59% reduction, unburnt hydrocarbon emissions reduce by 35% and smoke opacity is reduced by 30% when injection pressure is increased from 200 bar to 240 bar.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007722, Vol. 2236, Issue No. 1, 20th May 2020, pp 030007-1- 030007-6.*

Design and Fabrication of Automated Prosthetic Arm

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ABSTRACT

This Paper presents the design and fabrication of an operational first prototype of the Automated Prosthetic Arm capable of autonomously determining the object and selecting the most appropriate method for grabbing the said object. Autonomy of the device is achieved through the use of a unique software/App control system which takes input from module's embedded in the arm to determine the object, the position of each finger, grip strength and the quality of grip. The intended use of this technology is in the medical field as a prosthesis. However, the hand could also be adopted to work on other robot platforms as a versatile gripper to perform various repetitive/monotonous work. The advantage of our system as a prosthesis is that its autonomous functions will allow the user to access a wide variety of functionality more quickly and easily than similar, commercially available products. This project covers a broad range of engineering disciplines. The root of the system is an innovative mechanical design for a 3D printed automated prosthetic arm. The Modern day electronic actuators and circuitry enhance the device and allow for sophisticated control schemes. It is strongly believed that this work will be of a great value to a diverse audience.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007070, Vol. 2236, Issue No. 1, 20th May 2020, pp 070003-1- 070003-6.*

A Brief Review on Nickel and Chromium Coatings Developed by Electrochemical Route

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ABSTRACT

Electrodepositions of Nickel and Chromium have gained considerable attention during the last few decades. In this context the present paper reviews the work done in this field, paying special attention to individual metal as well as alloy coatings of Ni and Cr base prepared by electrodeposition. Uses of direct current and pulsating current have been reviewed in detail and the suitable parameters are discussed. The paper also discusses the structure of the deposit and its improved properties, with special focus on corrosion resistance, micro-hardness, adhesion, etc.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0006832, Vol. 2236, Issue No. 1, 20th May 2020, pp 040007-1- 040007-7.*

Mechanical Characterization of Glass Microballoon Filled HDPE Syntactic Foams

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ABSTRACT

Mechanical behavior of glass microballoon (GMB) reinforced high density polyethylene (HDPE) matrix syntactic foams is investigated under tensile mode. GMB's are blended in HDPE using bra bender and subsequently compression molded to form the syntactic foam sheets. GMBs with true particle density 200 kg/m3 are varied by 0, 20,40 and 60 vol. % in HDPE matrix. With increase in micro balloon content modulus is increases while strength decreases. Syntactic foams present lower fracture strain as compared to neat HDPE. Compression molded neat HDPE exhibited higher modulus and lower strength as compared to injection molded samples. Micrography is performed using scanning electron microscope for all the tested samples

**Full paper: AIP Conference Proceedings, Vol. 2236, Issue No. 1, 20th May 2020, pp 040020-1-040020-6.*

Influence of Filler Incorporation on the Mechanical and Wear Behaviour of Synthetic Fiber Reinforced Polymer Matrix Composites- A Review

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ABSTRACT

Fiber reinforced polymer matrix composites have gained attention over a period of time because of the effortlessness in their processing, lower density, higher strength etc. Correspondingly, there has been a rise in demand to understand the friction and wear behaviour of polymers and their composites. Since mechanical properties are closely associated with tribological properties, this article attempts to conduct a review of both mechanical and tribological behaviour of polymer composites reinforced with synthetic fibers and fillers. This review paper is intended to benefit researchers to choose appropriate combinations of matrix-fiber-filler materials for applications involving friction and wear. The outcome of the mechanical and tribological tests indicates that the properties of most of the polymer composites have been effectively modified by fibers, fillers and/or solid lubricants acting in synergy.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0006881, Vol. 2236, Issue No. 1, 20th May 2020, pp 040001-1 - 040001-9.*

Influence of Injection Timing Engine in Performance and Emission Using Milk Scum Biodiesel Blends on CI

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ABSTRACT

Renewable fuel such as Biodiesel has become more interesting fuel due to rising expenses of standard fossil fuels, to meet growing energy demand and an alternative to reducing oil reserves. In the compression ignition engine, biodiesel proves to be an alternative feasible option for gasoline, biodiesel burns like crude oil fuel and has controlled pollutants. The larger cost of bio-diesel production can be decreased by using waste products as a feed inventory and waste oils also present a very severe threat to the atmosphere due to their worldwide disposal issues. The waste oil receives renewed interest now and research shows that Dairy Waste Scum Oil based biodiesel produced by 2step transesterification as a suitable option because of its free fatty acid. The present work includes testing the performance and emission characteristics on Diesel, B10, and B20 Milk Scum Biodiesel Blends in a CI engine with varying injection timings. The tests reveal that the B20 blend is found to be best as it has improved BTE and BSFC in comparison with B10 and diesel. Also, emissions for B20 gave the satisfactory results. Results found show an increase in BTE from 29.46% to 31.34%, whereas BSFC remains the same at 0.27kg/kW-hr at full load when injection is advanced 5 deg before TDC. Also, it is observed at maximum load HC reduced from 19 ppm to 14 ppm, reduction in NOx from 518 ppm to 322 ppm and drastic reduction of smoke from 58.7 HSU to 42.9 HSU when injection timing is advanced.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007455, Vol. 2236, Issue No. 1, 20th May 2020, pp 030005-1 - 030005-8.*

Effect of Plastic Strain and Processing Routes on the Hardness of as-cast Aluminum

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ABSTRACT

In the present study, Equal Channel Angular Pressing (ECAP) of commercially pure aluminum (Al) in the cast form was carried out at room temperature for assessing its hardness by different routes and passes. The different routes employed in the present investigation are A, BA, BC and C. The Al specimens were pressed by a die of 150° channel angle without back pressure with Molybdenum disulfide (MoS2) as the lubricant. ECAP has significantly improved the hardness of Al in the subsequent passes. It has been observed that the hardness has been increased after first pass at room temperature from 47 VHN in the annealed condition to 54 VHN and after the second pass the hardness value has been increased to 56, 57, 62 and 56 VHN for routes A, BA, BC and C respectively. The increase in the hardness may be attributed to the severe fragmentation of microstructure of cast Al and the change in the orientation of the specimen from one pass to the next pass. After one pass, the dendritic microstructure of cast Al has been distorted by the shear stress developed during deformation. The processing by different routes with number of passes has further refined the microstructure leading to a better hardness in the cast Al.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007404, Vol. 2236, Issue No. 1, 20th May 2020, pp 040017-1 - 040017-5.*

Development of Water Filtration Unit for Waste water Generated from Waste Plastics Recycling Machines

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ABSTRACT

Water pollution has been increasing at an alarming rate and is a major problem in today's world. Wastewater from some of the plastic recycling industries are directly discharged into the water bodies without undergoing any treatment which has endangered the aquatic life. As the waste water contains harmful toxic pollutants such as lead, arsenic, cadmium, chromium, nickel, etc. it is important to treat the waste water. The main aim of this work is to develop a waste water filtration unit for the waste plastic washing and shredder machine and extruder-injection moulding machine. The filtration system involves the use of Nano-solution and consists of a multi-grade sand filter along with a micron bag filter, which can eliminate major pollutants from the waste water. The waste water is rigorously mixed with the help of an mechanical agitator in order to catalyse the flocculation process. The treated water can further be reused for cleaning of waste plastics and for cooling the machinery, which helps in conservation of water and maintain an eco-friendly environment.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007039, Vol. 2236, Issue No. 1, 20th May 2020, pp 050009-1- 050009-15.*

Numerical Study of Hydrogen Absorption in a Metal Hydride Tank Embedded with multiple U-Shaped Cooling Channel

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ABSTRACT

In the present paper, a three-dimensional hydrogen absorption model is applied to a cylindrical LaNi5 hydride bed embedded with multiple U-shaped cooling channels having fins fitted in different orientations. Four number of cooling channels are placed radially at equal distances to achieve uniform heat removal from the bed. The fins are fixed to the coolant channel in transverse and radial directions. The fins volumetrically collect heat from the bed and deliver to the coolant channels. Three metal hydride bed cases are numerically studied, they are with: only coolant channels - case 1, coolant channels fitted with transverse fins - case 2 and coolant channels with transverse and radial fins - case 3. From the simulation results, it is revealed that the presence of fins in the coolant channels significantly improves the heat transfer and hydrogen absorption rate in the bed. The hydrogen absorption in the bed approaches 90% of saturation in 998 s, 867 s and 656 s for case 1, 2 and 3, respectively. Detailed multi-dimensional contours of temperature and hydrogen to metal ratio distributions in the bed are presented for different cases. This study provides a better understanding of heat and mass transfer during the hydrogen absorption in a metal hydride bed.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0006858, Vol. 2236, Issue No. 1, 20th May 2020, pp 030004-1- 030004-8.*

Empirical Study of Engine Performance and Emission Parameters Using Python Module

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ABSTRACT

In this study a preheater was fabricated to increase the temperature of intake air and experiments were carried out for 30°, 40°, 50° and 60°C. B20 blend of Pongamia Pinnata biodiesel was used as fuel. It is observed that as the temperature of intake air rises, the brake thermal efficiency (BTE) increases by 1% from 30° to 60°C, similarly brake specific fuel consumption (BSFC) decreases by 9%. Among emissions, it is observed that, the oxides of nitrogen increases (NOx) by 10.1%, emission of HC and Smoke opacity decreases by 36% and 16% respectively. The results obtained are mathematically modelled using fitting of curves method by using Python module and the best suited equation is derived. It is found that the quadratic equation y=a*x2+b*x+c suits well for BSFC and NOx variation against the temperature. The equation y=a*bx is the best fit curve for BTE, HC emission and smoke opacity.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007072, Vol. 2236, 20th May 2020, pp 030006-1- 030006-6.*

Automatic Tyre Inflation System for Heavy Vehicles

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ABSTRACT

The project aims to develop a unique system to minimize the effect of uneven pressure in the wheels of heavywheeler vehicles and to improve the life of it. The system includes a pressure sensing element, pressure distribution system,and an air compressor. A complete prototype has been developed to test for the possibilities and it has been found that thesystem was working properly and met its objectives. The tyre pressure variation was detected by pressure sensor and if itwas less than the required pressure, the system supplied the pressurized air to the tyre through pressure distribution systemand maintained the required pressure inside the tyre. By doing this, the effort of the driver to maintain the required pressurein the tyre has been greatly reduced and it also improved the life of the tyre, performance of the vehicle also increased andreduced the tyre wear rate.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0010372, Vol. 2236, 20th May 2020, pp 050010-1- 050010-5.*

Portable Wall-Putti Applying Machine

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ABSTRACT

The primary aim of this project is to design, develop and implement "Portable Wall Putty Applying Machine" which helps to achieve low cost wall putty applying equipment and safety. In this paper a methodology for developing aportable machine which is able to apply putty on interior and exterior walls of a building with very less effort, hazard and time. The wall putty chemicals can cause hazards to the human body such as eye and respiratory system problems, also the nature of wall putty applying procedure requires repeated work and hand rising makes it tough, more effort and time consuming. The construction working process as a whole can be effectively managed and lead to decrease in human labour and timing when the construction workers as well as the machines are integrated properly. In addition it would provide chance to scale back or eliminate human exposure to tough and unsafe environment which might solve most of the issues connected to safety. A portable low cost wall-putty applying machine has been designed and tested for its performance and it has been concluded that the machine worked well and met its objectives.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0010371, Vol. 2236, Issue No. 1, 20th May 2020, pp 050008-1- 050008-9.*

Comparative Study of Pongamia Biodiesel Blends with Titanium Dioxide Nanoadditives on Performance Parameters of CI Engine

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ABSTRACT

Fuel additives play a vibrant role in the improvement of the performance parameters of CI engine. In this research work Titanium dioxide (TiO_2) nanoparticles are dispersed in Pongamia Pinnata biodiesel as nano fuel additive. Experimental work is carried out on three blends B10, B20 and B30 of Pongamia Pinnata biodiesel. The performance parameters, and combustion parameters are recorded using a computerized CI engine test apparatus and emissions are recorded using an exhaust gas analyser. It is inferred that nanoadditive improves performance of engine and also helps in reducing exhaust gases. Among the fuel samples tested B20T75 (75 ppm of TiO_2 nanoparticles added to B20 blend) has a maximum increase in Brake thermal efficiency(BTE) of 1.47% and maximum decrease in Brake specific fuel consumption(BSFC) of 7.29% with the addition of TiO_2 nanoadditive. Nitrogen Oxides, reduces by 4.3%, 3.9% and 4.2% and Unburnt hydrocarbons reduce by 20%, 13.6% and 11.1% when nanoadditive are added to B10, B20 and B30 respectively. Smoke opacity value of B10, B20 and B30 reduces in the presence of TiO_2nano additives by 9.2%, 11.04% and 7.9% respectively. Among the fuel samples tested, the maximum cylinder pressure is 66.02 bar, occurs in case of B10T75. B30T75 is showing maximum heat release of 47.27 J/deg. It is concluded that B20T75 nanofuel sample exhibits better performance and emission characteristics compared to other fuel samples tested.

Full paper: Journal of Critical Reviews, DOI: 10.31838/jcr.07.10.519 ,Vol. 7, Issue No. 10, 2020, pp 3238-3244

Hydrophobic, Superabsorbing Materials from Reduced Graphene Oxide/Mos_2 Polyurethane Foam as a Promising Sorbent for Oil and Organic Solvents

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ABSTRACT

This study illustrates the preparation of robust superhydrophobic and superoleophilic reduced graphene oxide (rGO) and MoS_2 nanoparticles incorporated polyurethane (PU) foam by in-situ polymerization via the one-shot method. Spectroscopic analyses confirmed the successful formation of nanoparticles and also the development of the hybrid PU material. The sponges were evaluated based on hydrophobicity and oil absorbance capacities and the modified foam exhibits the water contact angle of 151°. The pore size of the foam analyzed using an optical microscope and the effect on the density and porosity were also analyzed. The oil absorption capacity of the foam was studied using standard sorption testing. The oil and organic solvent selectivity and recyclability of hybrid PU foam were performed to estimate whether the foams could be recycled and reused. The modified system shows very high selectivity (83–94%). The recyclability of the foam was about 35 cycles without much reduction in its own weight and after 55 cycles more than 80% of the oil absorption capacity was conserved. The resulting hybrid PU material is highly efficient, porous, ultralight, hydrophobic and reusable sorbent material and displays great potential for versatile environmental remediation.

** Full paper: Polymer Testing, Vol 87, 2020, pp 106429*

Deployment of lean manufacturing in a die shop: An ASRS approach

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ABSTRACT

Lean manufacturing is the backbone of any industry striving for high productivity. Die shop management is a critical function in the manufacturing of inserts. The top punch, bottom punch, die, and core rod decide the shape, size, and quality of the cutting tools. It is important to know the condition, availability of tools, and other details about the components in the press toolbox. This project is carried out in an industry where these tools are currently stored in a manual storage rack. This type of storage and retrieval method is time consuming and undesirable. Therefore, the Automatic Storage and Retrieval System (ASRS) approach is used,which is an alternative solution for optimizing the storage and retrieval method, and directly effects the production. ASRSs are warehousing frameworks that are utilized for the storage and recovery of items in both the distribution and production environments. Most of the checked-on models and arrangement strategies are used in ASRS to reduce wastage of time. The objective is to change an undesirable manual storing and retrieval method to a convenient ASRS system. This project intends to improve speed and accuracy, and hence prove to be a sound and economical process

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0006790, Vol. 2236, Issue No. 1, 20th May 2020, pp 050004.*

Modeling and Analysis for Wear Performance of Coconut Shell Powder Filled Glass Fiber Composite using Taguchi approach

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ABSTRACT

This paper involves the modeling and analysis of a composite material. Here, the wear properties of the given composite are analyzed and appropriate conclusions are drawn from the tests conducted. The composite material is made up of filling coconut shell powder as the filler material in a glass fibre epoxy material. Polymer materials composites (PMCs) are widely coming into application as a novel material due to its high strength to weight ratio, high stiffness to weight ratio, its ease of processing, significant reduction in cost and its excellent performance in varied conditions. They are finding increasing use in the aerospace, automobile, marine and civil industries in todays world. This study conducted analyzes the influence of independent parameters such as sliding velocity, normal load, filler content and sliding distance on the wear performance of the manufactured composite material. The experiment was conducted using a standard pin on disc setup of a wear and friction testing apparatus. The addition of the extra filler materials greatly influences and optimizes the wear performance of the material.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007090, Vol. 2236, Issue No. 1, 20th May 2020, pp 040012.*

Analysis and Comparison of Compound Parabolic Solar Concentrator Configurations for box type Solar Cooker

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ABSTRACT

Solar energy is a very important renewable source of energy, which is finding numerous applications in the present state of energy crisis. Solar energy is a low-grade energy, barely 700 watts/m^2 of insolation on a yearly average. Hence to get more energy we need to cover more area and thereby, systems become bulky. For higher energy requirements we require to have higher area, catching the Sun. For higher temperatures, we have to concentrate this low-grade energy on a smaller receiver. A Compound Parabolic Solar Concentrator (CPC), concentrates the maximum amount of solar radiation on a planar receiver as long as the sunlight enters within the acceptance angle of the CPC. In the present work an attempt has been made to implement CPC to collect energy for a box type solar cooker. Two CPC Configurations, one with aperture area 0.429m^2 with an half acceptance angle of 30° untrunkated, and the other with a aperture area 0.385 m^2 with an half acceptance angle of 45° truncated, for a same planar absorber surface area of 0.193 m^2 were fabricated and experiments were conducted to investigate and compare the performance of above two CPC configurations. The analysis carried out has shown that the performance of box cookers can be enhanced by using CPCs. Further, the CPC-30° was more efficient due to better concentration resulting from greater aperture area and more reflecting surfaces. The average maximum efficiency of CPC-30° half acceptance was 21% and that of CPC-45° were 19% during the months February, March and April.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0007928, Vol. 2236, Issue No. 1, 20th May 2020, pp 030003.*

Effect of content of SiC on Al 6061 processed through stir Casting

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ABSTRACT

In the past few decades research on Aluminium composites has been increased due to the requirement of high strength, high performance and good quality material. In the present investigation effect of different wt% of SiC on the Al 6061 has been studied. Two different composites were produced with 2.5 wt% of SiC and 10 wt% of SiC with Al 6061 were processed through Stir casting. Hardness, Tensile and Wear tests were performed to study the effect of SiC on Al 6061. It was found that, hardness of the composite has been increased due to the presence of stronger and stiffer reinforcement. Increase in the percentage of SiC significantly increases the Tensile and Wear properties

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0006825, Vol. 2236, Issue No. 1, 20th May 2020, pp 040015.*

Robust design of Proportional Integral Controllers: a Taguchi-grey approach

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ABSTRACT

This paper aims to apply a statistical approach for a robust design to determine the optimum levels of proportional integral (PI) controllers by considering the noise parameters in the control engineering arena. Taguchi's robust engineering methodology and grey relational analysis (GRA) methodology are utilised for multi-objective optimisation of the process parameters. Taguchi method is effectively applied to ensure the robustness of the controller designed under the set range of model parameter uncertainties, which cause undesirable variation in the PI controller's performance. The ascertained optimal parameters from the Taguchi-Grey approach are subjected to simulation analysis to determine the settling time and performance indices. During the study, it is reconfirmed that statistical tools' application assists in developing a robust controller design in a structured manner. Moreover, it is observed that the approach helps in multi-objective optimisation by accommodating both control and noise parameters in the control system design.

Full paper: International Journal of Modelling, Identification and Control, DOI: 10.1504/IJMIC.2020.114791, Vol.35, Issue No.4, 2020, pp.363 – 375.

Effect of Plating Time on Surface Morphology and Coating Thickness of Nickel Plating on Copper Surface

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ABSTRACT

In the present work, Ni thin films were deposited by electrodeposition method on copper substrate. The coating time was varied systematically in the range of 10 – 25 minutes during the deposition process resulting in variation in coating microstructure and properties. Structural properties and morphological studies were investigated by using Energy Dispersive Spectroscopy (EDS), X-ray diffraction (XRD), and Scanning Electron Microscopy (SEM) techniques. Coatings were analyzed for their variation in current efficiency and coating thickness with plating time. XRD peaks were observed to be broad and short indicating man-sized coating. The morphology of coating was observed to be made of smaller primary nodules and large secondary nodules. The secondary nodules were observed to be of coffee bean structure. With the increase in plating time, the secondary nodules growth rate was observed to increase forming a truncated pyramid kind of structure, leading to increased roughness. Plating of Ni by electrodeposition has an advantage due to its porous nature of coating leading to self-lubrication effect.

**Full paper: Journal of Phase Change Materials, https://doi.org/10.6084/jpcm.v1i1.5, Vol.1, Issue No 1, 2021, pp 1-7.*

Effects of Current Density on Surface Morphology and Coating Thickness of Nickel Plating on Copper Surface

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ABSTRACT

Nickel (Ni) thin film was deposited on commercial pure copper using electrodeposition method. To understand the growth behavior of Ni nodules, deposition was done by varying the coating current density. The topography of the coating was analyzed using Scanning Electron Microscope (SEM). The coatings were also analyzed for variation in amount of coating, cathode current efficiency and thickness of coating. The deposited Ni thin film was observed to be of coffee bean kind of secondary nodules with size varying from 400 to 800 nm and almost spherical primary nodules with size varying from 100 to 250 nm varying as a function of coating current density. At higher current density, the coatings were observed to be of multiple layers of nodules. This suggests the presence of defects like twins, dislocations and stacking faults. The nodules are observed to have fine crystallites in the nano range.

Full paper: Turkish Journal of Computer and Mathematics Education, https://doi.org/10.17762/turcomat.v12i10.4047, Vol.12, Issue No 10, 2021, pp 79-83.

Analysis of Heat and Mass Transfer during Charging and Discharging in a Metal Hydride - Phase Change Material Reactor

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ABSTRACT

This paper presents the heat and mass transfer study during charging and discharging processes in a metal hydride reactor (MHR) equipped with phase change material (PCM). The PCM numerical model is newly developed and incorporated into the metal hydride (MH) model, which was presented earlier [1]. It is based on the enthalpy-porosity formulation and considers source/sink terms in energy and momentum conservation equations. The study explores the effects of metal foam incorporated into PCM, and the variation of its porosity and pore density towards better heat transfer, and hydrogen charging and discharging rates. Detailed performance analysis of the MHR-PCM system with and without metal foam is performed, and the results show a significant improvement in performance with the PCM having metal foam embedded in it. The study on the effect of metal foam porosity reveals an interplay between effective PCM thermal conductivity and PCM amount on the hydrogen charging rate. The study clearly illustrates the limitation posed by the MH powder thermal conductivity on heat transfer and optimizes the metal foam morphology for improved hydrogen charging and discharging rates. The natural heat convection in the PCM is found to be negligible due to its high density. A brief study on the influence of hydrogen inlet and exit pressures, and the amount of PCM on charging and discharging rates is also performed. The study provides an in-depth insight into the formation of liquid and mass fraction fronts in the PCM and MH regions, respectively, under different operating conditions and PCM configurations.

**Full paper: Journal of Energy storage, https://doi.org/10.1016/j.est.2020.102108, Vol.33, Issue No 1, 2021, pp 102108.*

Porosity Study on Microstructures of Nickel-Chromium Alloy Plating on Copper Substrate

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ABSTRACT

Porosity in coatings is a vital parameter for many engineering applications. Having a porous coating is good with respect to few aspects and bad with respect to others. One of the main applications of porous metal coating is in the field of membrane filters for oil water separation to deal with industrial wastewater and off-shore oil spills. It is also used for electrolytic cleaning (purification) of water. Studying the nature of formation and development of pores is being carried out by many researchers to determine the parameters affecting the porosity of coatings. Optimizing the parameters to obtain a favourable coating with least defect is the idea behind these research topics. Nickel and chromium coatings are widely used for many industrial applications because of specific properties. Nickel-chromium alloy coatings offer better hardness, wear and corrosion resistance compared to individual nickel or chromium coatings. The alloy coatings are observed to be porous in nature compared to individual nickel and chromium coatings. Controlling the porosity of the deposition by varying the process parameters is a very interesting topic of research as it greatly influences the properties. In the present work, the coating microstructures of nickel-chromium alloys developed by electrodeposition techniques are analysed and evaluated using Field Emission Scanning Electron Microscopy (FESEM) for varying current densities and plating time resulting a good uniform coating with varying porosity

**Full paper: Journal of Applied Surfaces and Interfaces ISSN: 2550-4800, https://doi.org/10.48442/IMIST.PRSM/jasi-v9i1-3.27066, Vol.9, Issue No 1, 2021, pp 17-22.*

Production Optimization of Vateria Indica Biodiesel and Performance Evaluation of Its Blends on Compression Ignition Engine

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ABSTRACT

The rapid depletion of fossil fuels and the increasing levels of exhaust gas emissions have paved the way for researchers to focus their attention on alternative fuels. One such potential alternative source of fuel is biodiesel. In the light of the search for newer fuels, the present work focuses on *Vateria Indica* biodiesel that is found widely in Western Ghats of India and Srilanka. The work reports on the extraction of *Vateria Indica* oil, preparation of its biodiesel and performance testing of biodiesel blends on compression ignition engines (diesel engine). The oil and biodiesel yields have been optimized by Response Surface Methodology (RSM) and are found to be 23% and 85% respectively. The performance test results of *Vateria Indica* biodiesel blends on diesel engine have indicated that the brake thermal efficiency (BTE) was found to be lower and the brake specific fuel consumption (BSFC) was found to be higher for B10 (90% diesel+10% biodiesel), B20 (80% diesel+20% biodiesel) and B30 (70% diesel+30% biodiesel) blends compared to neat diesel. The performance characteristics of the B10 blend were very close to neat diesel. The combustion characteristics of biodiesel blends were found to be superior compared to neat diesel. The B30 blend has better combustion characteristics compared to B10 and B20 blends. The emissions of unburnt hydrocarbons (UBHC), carbon monoxide (CO) and smoke were lower, and oxides of nitrogen (NOX) were higher for all the blends of biodiesel compared to neat diesel.

**Full paper: Sustainable Chemistry and Pharmacy, https://doi.org/10.1016/j.scp.2021.100475, Vol 22, September 2021, pp 100475*

Effect of Injection Pressure on Performance and Emission of Crdiengine Operated With Biofuel Produced from Cashew Nut Shell Liquid Mixed With Honge Methyl Ester

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ABSTRACT

In this research work, raw Cardanol, which is a biofuel based on a non edible plant, produced from cashew nut shell liquid (CNSL) was blended with Honge methyl ester (HME) used as a test fuel in a VCR CRDI diesel engine.Biofuel blends C5H10 (5 % Cardanol +10 % Honge methyl ester +85 % Diesel), C10H10, C15H10 and C20H10 were prepared and tested under varied load conditions at three different injection pressures(300 bar, 400 bar and 500 bar) and compared to diesel fuel. It was found that when the injection pressure increased from 300 to 500 bar, the brake thermal efficiency improved from 30.53% to 31.93% for C10H10 compared to 32.54% for diesel with reduction in Carbon monoxide (CO) and unburned hydrocarbons but NOx levels and smoke opacity were observed to high. From this study it is shown that 500 bar injection pressure found optimum for C10H10 blend could improve the performance and emission in diesel engine.

Full paper: International Journal of Latest Research in Engineering and Management (IJLREM), ISSN: 2456-0766, Vol 05, Issue No 2, February 2021, pp 12-20

Spatial Analysis of CO Poisoning in High Temperature Polymer Electrolyte Membrane Fuel Cells

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ABSTRACT

The improved tolerance of the High Temperature-Polymer Electrolyte Membrane Fuel Cell (HT-PEMFC) to CO allows the use of reformate as an anode feed. However, the presence of several per cent of CO in the reformate, which is inevitable particularly in on-board reformation in automobiles, which otherwise demands complex systems to keep the CO level very low, will significantly lower the cell performance, especially when the HT-PEMFC is operated at 160 °C or below. In this study, a three-dimensional, non-isothermal numerical model is developed and applied to a single straight-channel HT-PEMFC geometry. The model is validated against the experimental data for a broad range of current densities at different CO concentration and operating temperatures. A significant spatial variation in current density distribution is observed in the membrane because the CO sorption is a spatially non-homogeneous process depending on local operating conditions and dilution of the H2 stream. To investigate the local spatial effects on HT-PEMFC operation, the model is applied to a real cell of size 49.4 cm2 with an 8-pass serpentine flow-field at the anode and the cathode. The membrane and anode catalyst layer are segmented into array to investigate the spatial resolution of the polarization curves, H2 concentration, current density, and anode polarization loss. The simulation results show that the presence of CO in the anode feed reduces cell performance, however, the results reveal that uniformity in current density distribution in the membrane improves when the cell is operated in potentiostatic mode. The results are discussed in detail with the help of several line plots and multi-dimensional contours. The study also emphasizes on the importance of optimizing the reformate anode feed rate to improve cell performance.

**Full paper: International Journal of Hydrogen Energy, https://doi.org/10.1016/j.ijhydene.2020.12.001, Vol 46, Issue No 11, February 2021, pp 8179-8196*

A Numerical Investigation on Thermal Gradients and Stresses in High Temperature PEM Fuel Cell during Start-up

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ABSTRACT

The High Temperature Polymer Electrolyte Fuel Cell (HT-PEMFC) stacks using polybenzimidazole (PBI) based membranes have an inability to internally heat up at low temperatures to their nominal operating temperature (160°C–180°C) during the start-up process. Several strategies, such as direct electrical heating, coolant/gas channel heating, catalytic hydrogen-oxygen combustion, etc., are proposed in the literature to assist the heating for quick start-up situations. However, little knowledge exists on the transient thermomechanical stresses induced during the start-up heating process due to non-uniformity in heat supply and disparity in thermal properties of the cell components. The objective of the present research is to analyze the thermal gradients and thermal stresses developed in the HT-PEMFC structure during the start-up with various heating methods discussed in the literature, as well as during the cell operation by exploiting the Fluid-Structure Interaction (FSI) approach. The use of polyalkylene glycol (Fragoltherm S-15-A) based Heat Transfer Fluid (HTF) in the coolant channel has substantially improved the start-up time due to the high Nusselt number. However, a significant gradient in temperature distribution is observed during the preheating process, which resulted in great inhomogeneous stresses in the membrane, particularly in the in-plane direction. Interestingly, the degree of uniformity in membrane current density distribution during cell operation is increased. A detailed heat analysis in the cell showed that the heat generated in the cell due to electrochemical reactions is sufficient to raise the cell temperature from 120°C to operating temperature in a short time. Being subjected to a compressive stress of above 40 MPa, which is higher than the ultimate strength of a typical acid doped PBI membrane, the electrolyte is the most vulnerable component during the start-up. Hence, to inhibit the concomitant effect on cell performance and degradation, a novel start-up strategy should be implemented.

**Full paper: International Journal of Heat and Mass Transfer, https://doi.org/10.1016/j.ijheatmasstransfer.2021.121365, Vol 175, August 2021, pp 121365*

Nickel Plating of Copper Moulds for Preventing Star Crack Defects - Analytical and Numerical Approach

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ABSTRACT

Mould is a key element in the continuous casting process and is normally represented as the heart of a continuous casting machine. Copper (Cu) and its alloys are widely used to manufacture mould plates due to its excellent thermal conductivity and corrosion resistance. However during the service these copper moulds get severely worn out and corrode. There is a possibility of Cu elements produced by wear and friction entering into liquid steel during the solidification process. This will lead to development of surface cracks on the steel slabs produced followed by decline in quality. The commonly used term to represent these surface cracks developed in the cast steel slab is star crack defects. There are different reasons for the formation of star cracks, the major one being the non-uniform heat transfer through the solid shell and the surface irregularities of the manufactured copper mould plate being the other reason. The present work focusses on identifying the presence of surface irregularities in the polished copper substrate using scanning electron microscopy technique, coating the substrate by a thin layer of nickel by electrodeposition technique providing a uniform harder surface and performing thermal analysis on the coated and plane copper sample. The results of the analytical and numerical analysis is correlated to the actual application of nickel plating on copper mould plate, thereby reducing the possibility of star crack formation in continuous cast steel. Coating of nickel reduces the thermal conductivity of the mould slightly thereby reducing the rate of heat transfer. This reduction in heat transfer rate reduces thermal shocks leading to lower possibility of star crack formation.

**Full paper: Proceedings of the International Conference on Emerging Trends in Nanoscience and Nanotechnology, 07 August 2021, pp 119-126.*

Investigation on Performance and Emission Characteristics of Diesel Engine with Cardanol Based Hybrid Biodiesel Blends

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ABSTRACT

In this study the performance as well as emission tests were conducted on Kirloskar diesel engine (a single-cylinder 5.2 kW) using Cardanol as a bio-diesel. Cardanol was produced from cashew nut shell liquid (CNSL) blended with Honge methyl ester in addition to diesel. The biofuel blends 5C5H (5% cardanol + 5%Honge oil + 90% diesel), 5C10H, 5C15H and 5C20H were prepared and tested at various loads (0%, 20%, 40%, 60%, 80% and full load conditions) and results are compared with diesel at 205 bar injection pressure and 17.5 compression ratio. The experimental results showed that at full load, the brake thermal efficiency of 5C5H is 29.35% which is similar to that of diesel i.e., 31.05%. The lower emissions of CO, HC except NOx are encouraging to recognize 5C5H as an optimized fuel blend for a compression ignition engine.

**Full paper: Proceedings of the International Conference on Laser Deposition: Nanostructures, Hetero-structures and 2D layer, Materials Today: Proceedings, Vol 35, Issue No 3, 2021, pp 378-382*

Effect of Injection Pressure on Performance and Emission of Diesel Engine with Blends of Honge-Rice Bran Biodiesel

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ABSTRACT

In this study the performance and emission tests were conducted on a single cylinder 4 S diesel engine using Honge biodiesel and Rice bran methyl ester (RBO) blend with diesel. Two samples of bio diesel blends 10R5H (10% RBO + 5% Honge + 85% Diesel) and 20R5H (20% RBO + 5% Honge + 75% Diesel) were prepared and tested at different injection pressures such as 180 bar, 200 bar and 220 bar at 16.5 compression ratio with varied load and the results are compared with diesel at 220 bar injection pressure. The test results showed that at full load, the brake thermal efficiency of 20R5H is 33.32% which is close to diesel i.e. 34.36%. Hongeand Rice bran hybrid biodiesel blends at 220 bar injection pressure exhibited better performance and low emission than at 180 bar injection pressure except NOx. Hence, the 20R5H optimized fuel blend can be considered for a compression ignition engine without any modification.

**Full paper: Proceedings of the International Conference on Laser Deposition: Nanostructures, Hetero-structures and 2D layer, Materials Today: Proceedings, Vol 35, Issue No 3, 2021, pp 489-493*

Effect of Fuel Intake Temperature on Performance and Emission of Diesel Engine

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ABSTRACT

Heating diesel fuel before injecting into the engine cylinder is the technique employed in this experiment with the primary objective of improving combustion and decreasing emission. This results in gasification of diesel when injected into the engine cylinder leading to better mixing, evaporation and combustion of diesel fuel. This also results in decrease of physical delay period. Experiments are done at standard injection timing with preheating done in the interval of 100°C, 175°C and 250°C. At each temperature, readings are taken at no load, 25%, 50% and 75% of full load. It is observed that preheating results in decreased emission of CO and HC at all the loads. At 50% and 75% load CO and HC decreased by about 35% and 50% respectively. NOx is also increased showing that combustion of diesel fuel is improved. Maximum brake thermal efficiency (BTE) and minimum brake specific fuel consumption (BSFC) is obtained at preheating temperature of 100°C at 75% load condition. With increase in load condition, performance is found to be better at higher preheating temperature. With increase in preheating temperature, performance and emission is better and efficient. Performance improvement is better at 50% load than at no load and 25% load.

Full paper: Proceedings of the IOP Conference Series: Materials Science and Engineering, Vol 1065, Issue No. 1, pp 012024

A Numerical Study of Metal Hydride Reactor Embedded With Helical Coil Heat Exchnager

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ABSTRACT

The critical challenge of heat management in a Metal Hydride (MH) reactor necessitates comprehensive research and development towards an effective heat transfer system to enhance its hydrogen charging and discharging rates. Several interesting strategies were reported in the literature to assist effective heat transport from and to the reactor. In this report, a comprehensive three-dimensional numerical model accounting for reaction kinetics and, heat and mass transfer is developed for hydrogen charging and discharging in a $LaNi_5$ based MH reactor. The model is compared with the experimental data, and the simulation results agree closely with the experimental data. A detailed parametric study is carried out to optimize the operating conditions of the reactor and the geometry of the Helical Coil Heat Exchanger (HCHX) to improve the hydrogen charging and discharging rates. The effect of essential parameters such as supply/exit pressures, Heat Transfer Fluid (HTF) temperature, and helical coil pitch/turns on the thermal performance and sorption rate of the MH bed are analyzed systematically. The hydrogen charging simulation results show that increasing the inlet hydrogen pressure and reducing the HTF temperature significantly improves the charging rate. From the HCHX design point of view, it is observed that increasing the number of coils turns benefits the hydrogen storage performance due to improved heat transfer from the MH bed to the helical coil. The influence of the exit pressure and the HTF temperature on the hydrogen discharge rate is also discussed in detail. The present study with multi-dimensional contours of temperature and hydrogen mass fraction will improve the fundamental knowledge of the MH reactor and shed light on the development of an effective heat exchanger.

**Full paper: Mathematical Fluid Mechanics: Advances in Convective Instabilities and Incompressible Fluid Flow, edited by B. Mahanthesh, Berlin, Boston: De Gruyter, https://doi.org/10.1515/9783110696080-009, 2021, pp. 201-222.*

Ten Commandments for successful implementation of Design for Six Sigma

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ABSTRACT

Purpose – This article aims to provide Design for Six Sigma (DFSS) practitioners, researchers, and academicians with Ten Commandments to successfully deploy projects.

Design/methodology/approach – The commandments are the brainchild of four authors' experience and expertise for more than 15 years of DFSS deployment in the spectrum of fields as a consultant, researcher, academic and Master Black Belt in Six Sigma, and general quality management and engineering disciplines. Thus ascertained commandments were validated and classified through the 'Delphi Study' to ensure its applicability.

Findings – The Ten Commandments from authors' perspective includes: Alignment of DFSS with organisational strategy; Top Management support and involvement; Listening to the Voice of the Customers (VOC); Effective training program for right project teams; Project selection and prioritisation; Linking DFSS with ISO international standards; Linking DFSS with organisational learning and innovation; Linking DFSS with the 4th Industrial Revolution; Effective use of DFSS methodology and the integrated tools within the methodology and Reward and recognition schemes.

Research limitations/implications – The commandments presented in this article are the authors' personal experience in different industrial scenarios and settings and demographical locationsvalidated through Delphi Study. The authors are planning to conduct a longitudinal survey to understand further insights of these commandments with the input of several DFSS Black Belts and Master Black Belts, academicians and leading researchers from various countries.

Originality/value – All the organisation's stakeholders can use this article as general guidelines to ensure effective deployment of the DFSS approach.

**Full paper: The TQM Journal, DOI: 10.1108/TQM-01-2021-0014, Vol 33, Issue No 8, 2021, pp. 1666-1682.*

Simulation-Based Lean Six Sigma for Industry 4.0: Action Research in the Process Industry

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ABSTRACT

Purpose – The primary aim of this article is to ascertain the modalities of leveraging Lean Six Sigma (LSS) for Industry 4.0 (I4.0) with special reference to the process industries. Moreover, it intends to determine the applicability of simulation-based LSS in the automation of the mineral water industry, with special emphasis on the robust design of the control system to improve productivity and performance.

Design/Methodology/Approach – This study adopts the Action Research methodology, which is exploratory in nature along with the DMAIC (Define-Measure-Analyze-Improve-Control) approach to systematically unearth the root causes and to develop robust solutions. The MATLAB simulation software and Minitab statistical software are effectively utilized to draw the inferences.

Findings – The root causes of Critical to Quality Characteristic (CTQ) and variation in purity level of water are addressed through the simulation-based LSS approach. All the process parameters and noise parameters of the Reverse Osmosis (RO) process are optimized to reduce the errors and to improve the purity of the water. The project shows substantial improvement in the sigma rating from 1.14 to 3.88 due to data-based analysis and actions in the process. Eventually, this assists the management to realize an annual saving of 20% of its production and overhead costs. This study indicates that LSS can be applicable even in the advent of I4.0 by reinforcing the existing approach and embracing data analysis through simulation.

Research Limitations/Implications – The limitation of this research is that the inference is drawn based on a single case study confined to process industry automation. Having said that, the methodology deployed, scientific information related to optimization, and technical base established can be generalized.

Originality/Value – This article is the first of its kind in establishing the integration of simulation, LSS, and I4.0 with special reference to automation in the process industry. It also delineates the case study in a phase-wise manner to explore the applicability and relevance of LSS with I4.0. The study is archetype in enabling LSS to a new era, and can act as a benchmark document for academicians, researchers, and practitioners for further research and development.

**Full paper: International Journal of Quality and Reliability Management, DOI: 10.1108/IJQRM-05-2020-0167, Vol. 38, Issue No. 5, 2021, pp. 1215-1245.*

Modelling and Optimization of Natural Fibre Reinforced Polymer Nanocomposite: Application of Mixture Design Technique

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ABSTRACT

Purpose –The aim of this article is to demonstrate the development of environment friendly, low cost natural fibre composites by robust engineering approach. More specifically, the prime objective of the study is to optimize the composition of natural fibre reinforced polymer nanocomposites using a robust statistical approach.

Design/Methodology/Approach – In this research, the material is prepared using Multi-walled Carbon Nanotubes (MWCNT), Cantala Fibres, and Epoxy Resin in accordance with the ASTM (American Society for Testing and Materials) standards. Further, the composition is prepared and optimized using the Mixture Design approach for the flexural strength of the material.

Findings – The results of the study indicate that MWCNT plays a vital role in increasing the flexural strength of the composite. Moreover, it is observed that interactions between second order and third order parameters in the composition are statistically significant. This leads to proposing a special cubic model for the novel composite material with residual analysis. Moreover, the methodology assists in optimizing the mixture component values to maximize the flexural strength of the novel composite material.

Originality/Value – This article attempts to include both MWCNT and Cantala Fibres to develop a novel composite material. In addition, it employs the Mixture Design technique to optimize the composition and predict the model of the study in a step-by-step manner, which will act as a guideline for academicians and practitioners to optimize the material composition with specific reference to natural fibre reinforced nano composites.

**Full paper: Multidiscipline Modelling in Materials and Structures, DOI: 10.1108/MMMS-05-2020-0122, Vol 17, Issue No.2, 2021, pp 507-521.*

Dynamic Classroom Strategies to Address Learning Diversity

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ABSTRACT

Diversity is inevitable in every walk-of-life, and rightly in the learning process. Lack of strategies to address the need for diversified learning style is one of the stumbling-blocks for achieving the desired outcome among the students. The purpose of the research is to dwell deeper into the pedagogies of engagement to establish the strategies to accommodate diversity in learning style within each session. The objective is to create a framework for resolving the issues of learning diversity through dynamic classroom strategies. Action Research Methodology is adopted to deploy and unearth the feasibility of strategies to resolve issues of learning styles. Silverman-Felder's learning style approach is used to create a dynamic classroom. Also, statistical techniques are used to draw the inference and to determine the effectiveness of the established strategies to resolve the learning issues. The study indicated that learning styles could be effectively addressed in every session through meticulous planning and deployment of active learning methodology. The dynamic classroom approach has resulted in the achievement of the desired outcome, which was validated through the assessment at the end of the session. Besides, the strategies adopted are validated by comparing the outcome of the other section through the internal test. Also, feedback of the students substantiated the methodology adopted to resolve the issues of diversity in learning styles. The study culminates that learning diversity can be addressed effectively only when the tutor is aware of learning styles and active learning strategies. Also, it is ascertained that the meticulous planning assists the faculty in ensuring value-added activities in the session. In addition, well-established determined that the scientific planning of the session brings socio-technical changes among the students and in the system.

**Full paper: Journal of Engineering Education Transformations, DOI: 10.16920/jeet/2021/v34i0/157168, Vol 34, 2021, pp. 694–702.*

Lean Six Sigma Competitiveness for Micro, Small and Medium Enterprises (MSME): Action Research in the Indian Context

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ABSTRACT

Purpose – The aim of the article is to ascertain the challenges, lessons learned, and managerial implications in the deployment of Lean Six Sigma (LSS) competitiveness to MSME (Micro, Small and Medium Enterprises) in India and to establish doctrines to strengthen the initiatives of the government.

Design/Methodology/Approach – The research adopts the Action Research methodology to develop a case study, which is carried out in a printing industry in a Tier III city using the LSS DMAIC (Define-Measure-Analyze-Improve-Control) approach. It utilizes LSS tools to deploy the strategy and to unearth the challenges and success factors in improving the printing process of a specific batch of a product.

Findings – The root cause for the CTQ (Critical to Quality) characteristic, Turn-Around-Time (TAT) is determined and the solutions are deployed through scientifically proven data-based approach. As a result of this study, the TAT reduced from an average of 1541.2 minutes to 1303.36 minutes, which in turn, improved the sigma level from 0.55 to 2.96, a noteworthy triumph for this MSME. The company realizes an annual savings of USD 12,000 per year due to the success of this project. Top Management Leadership, Data-Based Validation, Technical Know-how, and Industrial Engineering Knowledge Base are identified as CSFs (Critical Success Factors), while profitability and on- time delivery are the KPIs (Key Performance Indicators) for the MSME. Eventually, the lessons learned, and implications indicate that LSS competitiveness can be treated as QMS (Quality Management Standards) and QTT (Quality Tools and Techniques) to ensure competitive advantage, sustainable green practices, and growth.

Research limitations/implications – Even though the findings and recommendation of this research is based on a single case study, it is worth noting that the case study is executed in a Tier III city along with novice users of LSS tools and techniques. This indicates the applicability of LSS in MSME and thus, the modality adopted can be further refined to suit the socio-cultural aspects of India.

Originality/Value – This article illustrates the deployment of LSS from the perspective of novice users, to assist MSME and policy makers to reinforce competitiveness through LSS. Moreover, the government can initiate a scheme in line with LSS competitiveness to complement the existing schemes based on the findings of the case study.

**Full paper: The TQM Journal, DOI: 10.1108/TQM-04-2020-0079, Vol. 33, Issue No.2, 2021, pp. 379-406.*

Experimental Analysis of Influence of Injection Pressure on Compression Ignition Engine with Biodiesel and Nanoparticles Blend

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ABSTRACT

The scarcity *of* conventional fuel and stringent emission norms made researchers to look after alternative fuels to run *an internal combustion engine*. One of the possible alternatives for the Compression Ignition engine is biodiesel. Although there are some challenges such as high viscosity, low calorific value, carbon deposit on *the injector nozzle*, etc. To overcome these challenge nanoparticles are added which will bring most properties near to virgin diesel. Simarouba a non-edible biodiesel feedstock used and aluminum oxide nanoparticles are added with 50 nm size. Using a probe-type Ultrasonication process nano-biodiesel blend is prepared. To improve stability SDS surfactants are added. The characterization of nanoparticles studied using SEM image. The performance of the engine tested for different dosage levels of nanoparticles mainly 25 ppm, 50 ppm, and 75 ppm. The injection timing, injector pressure, and speed kept constant, whereas injection pressure is varied 200 bar, 225 bar, and 250 bar. There is found a 5.2% increase in brake thermal efficiency for nanoparticles added blend biodiesel at 250 bar compare to 200 bar pressure. For the same thing brake specific fuel consumption decreased by 9%. Most of emissions such as Carbon monoxide, unburnt hydrocarbons decreased, whereas there is a significant amount of increase in oxides of nitrogen emission found.

**Full paper: Proceedings of the IOP Conference Series: Materials Science and Engineering, Vol 1013, Issue No 1, pp 012036*

Equal Channel Angular Processing-A Modern Deforming Technique for Quality Products

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ABSTRACT

The grain size plays a significant role in determining the mechanical properties of the materials. Decreasing grain size increases strength, toughness, and ductility. Due to these, a lot of research has been executed to develop deforming techniques to produce ultrafine-grained materials. Among several plastic deformation techniques available, equal channel angular pressing or processing (ECAP) produces ultra-fine grained materials with substantial amount of high angle grain boundaries. ECAP produces ultra-fine grained material with typical substructural features, which are difficult to achieve using other severe deformation techniques. This chapter presents characteristics, variables, die design, and die materials employed in the process. The chapter also presents recent developments in the domain, such as, use of finite element techniques, etc.

**Full paper: Advanced Welding and Deforming – A volume in Handbooks in Advanced Manufacturing, 2021, pp 381-423*

Performance and Service Quality Enhancement in a Healthcare Setting through Lean Six Sigma Strategy

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ABSTRACT

Purpose The article intended to excavate the Lean Six Sigma (LSS) deployment challenges, Critical Success Factors (CSF), tools and techniques, and managerial implications in an Indian healthcare setting.

Design/methodology/approach The article illustrates a case study established using Action Research (AR) approach. Further, the case study is based on the Define, Measure, Analyze, Improve, Control (DMAIC) phases of LSS. The performance and service quality of the Endodontics department of a dental college attached to a hospital is enhanced and sustained through the LSS strategy.

Findings The processing time of Root Canal treatment is reduced by determining the root causes for delay and implementing sustainable solutions. The structured deployment of the LSS strategy helped the Endodontics department to reduce the processing time from an average of 116 min–84 min. Thus, the process's sigma level is enhanced from 0.06 to 4.17 and assisted in sustaining the results.

Research limitations/implications The case study's findings are based on the single AR carried out at an Endodontics department of a dental college hospital based on LSS strategies. Even though this study's results cannot be generalized, the deliverables of the case study can be used to develop the LSS roadmap for the dental colleges to enhance the service quality and safety of the patients.

Originality/value The article provides step-by-step details for implementing LSS in dental college hospitals with critical analysis based on robust statistical tools and techniques. The case study provides evidence of the adoption of LSS in medical college education and provides the confidence to adopt the same through novice users. The study's findings may persuade the policymakers to add LSS in the medical education curriculum to reinforce safety and reduce errors in the healthcare system.

**Full paper: International Journal of Quality & Reliability Management, DOI:10.1108/IJQRM-07-2021-0226, November 2021*

Sustaining Motivation of Engineering Students in India by Managing their Academic & Affective Needs

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ABSTRACT

In India, nearly 1.5 million students enrol in engineering programs in around 4000 colleges. These students come from very diverse demographic, sociocultural and economic backgrounds. Many of them are unable to successfully transition from school to the very demanding environment of engineering education because of poor levels of academic and emotional preparedness. They become demotivated and disengaged which in turn, negatively impacts their academic performance. The objective of this study is to investigate the reasons for demotivation and recommend possible solutions. The study was conducted in three phases using multiple specially designed instruments. In the first phase, Instrument 1 was administered to 349 students to establish the diversity in engineering student population. Then, 79 students with low motivation and academic performance were identified using Instrument II. Personal interviews were conducted using Instrument III with the identified low-performing subjects to get an insight into their learning and emotional needs. Over an entire semester, well-planned interventions were provided to address the identified learning and emotional needs. At the end of the semester, academic performance of the 79 subjects was re-recorded. Due to sudden lockdown and transition to online instruction in the middle of the semester (because of COVID-19), separate data were collected for pre and post lock down periods. Results obtained showed remarkable progress in both pre and post lockdown periods. The paper concludes with a set of concrete recommendations for engineering institutions and faculty for effectively managing student motivation, building confidence and getting them ready for the highly competitive job market.

**Full paper: Journal of Engineering Education Transformations, Vol 34, Special issue, January 2021, pp 507-517*

Comprehensive Strategy to Inculcate Professional Skills among First-Year Students: A Collaborative Learning Approach

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ABSTRACT

Inculcating teamwork, communication skills, and lifelong learning are essential metrics of Outcome Based Engineering (OBE). Ensuring these in early professional courses will enhance the ability of the students to adopt the OBE effectively in the forthcoming semesters. Effective planning and deployment of pedagogy of engagement will aid the students and faculty members to attain the desired outcomes with effective utilization of resources. This article unearths the challenges and documents the lessons learned in deploying collaborative learning in the First Year (FY) engineering education. It establishes a comprehensive assessment methodology from OBE perspective. Further, it addresses professional skills such as teamwork, communication skills, and lifelong learning in a structured manner. The Action Research methodology is adopted by taking into account the OBE approach enshrined in the Programme Outcomes (POs) as suggested by the Indian statutory bodies. The collaborative learning approach of 'Student, Teams, Achievement, Division' (STAD) is utilized by establishing a heterogeneous group. The Define-Measure-Analyze- Improve-Control (DMAIC) approach is used for project deployment and sustainment. Statistical analysis is used to interpret the results effectively. The study shows that the desired outcomes are achieved with a minimum duration of the teaching-learning process. Moreover, statistical analysis shows that even weaker students can reach the set attainment target due to heterogeneous group formation and collaborative learning. Eventually, the structured approach assists in developing a framework for the effective Shreeranga Bhat Department of Mechanical Engineering, St Joseph Engineering College, Mangaluru, Karnataka, India shreerangab@sjec.ac.in deployment of collaborative learning by establishing robust assessment tools to address the POs related to professional skills. The study shows that collaborative learning can be effectively deployed in FY engineering education with specific reference to POs related to professional skills within the optimal duration, provided a structured approach is embraced. It is also observed that heterogeneous group formation assists slow learners to elevate themselves to progressive learners due to teamwork and the influence of wiser students.

**Full paper: Journal of Engineering Education Transformations, Vol 34, Special Issue, January 2021, pp 599-606*

MANAGEMENT AND BUSINESS ADMINISTRATION

Investment Habits and Preferences of Investor towards Stock Market: An Empirical Study in Dakshina Kannada, Karnataka

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ABSTRACT

Stock investment is one of the most popular avenues of generating wealth in the modernworld. People might have heard several things about stock market investors ranging fromsome horrific losses to inspiring 'rags-to-riches' stories. The beauty of this investment avenueis that it treats every investor differently based on his/her approach to investments. Ifinvestors understand the logic of stock market investment, that is the paramount of investorsuccess. The current study tries to explore the factors influencing the investor's perceptionwhile investing in Stock Market Avenue and also tries to understand the habits and fondnessof investing in stock market.

** Full paper: Journal of Critical Reviews, ISSN- 2394-5125, Vol. 7, Issue No. 18, July 2020, pp 325-329*

The Impact of Dividend Policy on Share Price Volatility

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ABSTRACT

Any company which makes profit decides about the profit utilization that may be to preserve the profit or to distribute among the shareholders in the form of dividend. The dividend policy involves decision that is what portion of dividend is supposed to be paid out as dividend and what kind of dividend policy the company should follow while distributing dividend. The management has also captured the various stakeholders through paying dividend as form of profit. The company, in addition pays various forms of dividend that may be cash dividend, bonus dividend, special dividend, annual dividend; interim dividend etc. keeping this view in mind the research tries to explore the correlation of stock prices with dividend policy and the volatility of stock prices. And also tries to ascertain if there is any relationship among dividend payout and share price.

** Full paper: Studies in Indian Place Names, ISSN No.2394-3114, Vol.40, Issue No. 48, March 2020*

Assessing the Customer Satisfaction by Measuring Service Quality Using Servqual Scale

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ABSTRACT

The customer always expects a potentially great service from any business deal. The evaluation of service quality becomes quintessential in understanding the effectiveness of the service provided by the trader. Keeping this aspect in mind, a micro study was conducted to analyze the impact of service quality on customers of Cauvery Motors Pvt. Ltd., Mangaluru, by using the SERVQUAL scale. Twenty-two items that involve all five service dimensions as prescribed by Parasuraman et al. (1988) were used to understand customer perception on service quality. On the basis of service dimensions viz., Tangibles, Reliability, Responsiveness, Assurance, and Empathy, the responses were found to be satisfactory to the customers. Only the tangibility factor has to be worked on as there is more gap between expectation and perception. As per the calculation of weighted scores, there exists very little difference between the customer expectations and their perception regarding the service.

** Full paper: International Journal on Customer Relations, Vol. 8 Issue No. 1, 2020, pp 1-10.*

Perspective of Consumer and Retailer towards Campco Chocolates

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ABSTRACT

It is interesting to know the perception of the consumers as well as the retailers towards Campco chocolates where not much attempt has been made to apply research. Campco products are facing a serious competition from other chocolate brands that have a fierce advertising and market positioning strategy. Due to lack of competitive advertising and positioning the brands of chocolates sold by Campco are not well entrenched into the distribution network. Therefore, it is important to understand the perspectives and perception of both consumers as well as the marketers. The study has identified that consumer's location, profession, age, income and gender did not have any impact in choosing Campco products. Promotional strategies undertaken by Campco Chocolate Factory have reached present and potential consumers belonging to local area. Study suggests more brand positioning exercises to capture a wider market like the most popular brands such as Nestle, Cadbury, Amul and Snickers.

** Full paper: Asian Man (The) – An International Journal, p-ISSN: 0974-6366, 0974-6366, e-ISSN: 0975-6884, DOI: 10.5958/0975-6884.2020.00006.7, Vol. 14, Issue No.1, January-June 2020, pp 52-58.*

Impact of Bonus Issues Announcement on Share Prices with Special Reference to Auto Ancillaries Sector

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ABSTRACT

Bonus shares are additional shares given to the current shareholders without any additionalcost, based upon the number of shares that a shareholder owns. These are company'saccumulated earnings which are not given out in the form of dividends but are converted into free shares. When a company has huge profits and reserves, it will declare bonus share. Theprofit of the company is retained and is converted into share capital by issuing bonus.Declaration of high rate of cash dividend is prohibited by government, so the companies willissue the bonus share. The basic principle behind bonus shares is that the total number ofshares increases with a constant ratio of number of shares held to the number of sharesoutstanding. Keeping this view in mind the research tries to examine the impact of bonusissue on share prices. And also research tries to explore the significance impact ofannouncement of bonus shares on the share price of the companies.

** Full paper: DRSR Journal, UGC Care DOI:10.46528/drsrj.2020.v10i06n03.28, ISSN: 2347-7180, Vol.10, Issue No. 6, June 2020, pp 223-231.*

A Study on Price Mechanism of Spot and Future Price in Commodity Market with Special Reference to Crude Oil

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ABSTRACT

Price mechanism refers to Value instrument alludes to the framework where the strengths of interest and supply decide the costs of items and the progressions in that. It is the purchasers and merchants who really decide the cost of merchandise. Crude oil costs had been extremely unstable as of late. Instability in oil costs harms in numerous ways. Both creating and created nations are influenced. Spiking high costs influence poor individuals all the more specifically on the grounds that fuel expenses are critical in nourishment and transportation costs is which important expenditure. Oil cost high likewise strike economy on large scale stage and been have activating elements monetary cycle. Keeping this view in mind researcher tries to evaluate the spot and future mechanism.

**Full paper: National Conference on Start-Ups in India- Challenges, Issues & amp; Opportunities, Manel Srinivas Nayak Memorial Besant Institute of PG Studies, Mangaluru, 20th February 2020.*

Impact of Covid-19 on Indian Economy

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ABSTRACT

COVID-19 has impacted the global supply chain and this has affected all the different levelsof supplier network. There was a great fall in every region of the world of Global trade in2020 and this will have major hit to all the sectors in India and also it will impact countrieswho are exporters and as well as who are importers. Due to COVID-19 pandemic situationsglobal trade expected fall up to 32%. The current pandemic situations have a major hit to allthe sectors in India. Keeping this view in mind the researcher tries to explore the impact onTourism and Hotel Sectors

**Full paper: International Conference on Tackling Opportunities and Vulnerabilities during the Pandemic- Techno and Human Approaches, SDM College of Business Management Post Graduation Centre for Management Studies and Research, Mangaluru, 27th and 28th August 2020.*

Impact of Interest Rate on Stock Returns: An Empirical Study

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ABSTRACT

The two important factors for the economic growth of the country are stock exchange and interest rate. The implications of the impact of interest rate on stock exchange leads to the monitory policy, risk management practices, financial securities valuation and government policy towards financial market. The current study considers the five public sector banks to know the impact of interest rate on stock returns. Keeping this view in mind researchers try to analyze the price movements of shares of selected public sector banks due to the announcement of change in repo interest rate and also tries to examine the influence of reporates on Bank NIFTY.

**Full paper: 12th International E-Conference on Business, Management & amp; Information Technology, Prestige Institute of Management, Gwalior, 19th& 20th December 2020.*

Indian Stock Market PE Anomalies: An Empirical Study

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ABSTRACT

Price Earnings ratio is the best tool for investors' and analyst to resolve the stock valuation. It is the best metrics to show whether the company's stock is under priced or overpriced. The P/E can reveal a stock's valuation compares to its industry group or a benchmark of the S&P 500 index. P/E shows what the market is willing to pay today for a stock based on its past or future earnings. A high P/E represents the stock price is high relative to earnings and its overvalued and low P/E represents that the stock price is low relative to earnings. Keeping this view in mind researcher tries to examine the existence of price earnings ratio anomaly in the Indian Stock Market and also to evaluate the portfolios based on Sharpe, Treynor's and Jensen Alpha measure.

**Full paper: International Conference on Advances in Mechanical Engineering Sciences and Management, Dayananda Sagar College of Engineering, Bangalore, 7th -9th December 2020.*

The Holiday Effects in Stock Returns: A Challenge for the Textile and Clothing Industry of India

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ABSTRACT

This research paper examines the holiday effects presence on the Bombay Stock Exchange (BSE), which is a major Indian stock exchange. Textile and clothing industry in India is one of the most important producers in the world, but alsothe second exporter of textile and apparels globally. The empirical analysis investigates the impact of holiday effect onthe development of textile and clothing industry in India. The holiday effect is one of the most important calendar anomalies identified in the financial markets. The methodological approach includes the non-parametric Mann-Whitney U-test used to test the equality of means for different sub-sets. The findings revealed that the mean returns forpre-holiday and post holidays were greater compared to that of remaining days, but the empirical results showed that they were not statistically significant for selected stocks of BSE based on daily stock returns data for Ruby Mills and Mafatlal Industries.

Full paper: Industria Textila, ISSN 1222–5347, DOI: 10.35530/IT.071.04.1710, Vol. 71, Issue No 4, 2020, pp 327-333.

Further Evidence on Efficiency of Bahrain Bourse: A High Challenge for Other Industries

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ABSTRACT

The purpose of the present study is to provide further evidence of the weak form efficiency of the Bahrain Bourse. Theresearch methodology is based on daily closing index values of the Bahrain Bourse from 2011 to 2015 in order to testthe efficiency of the stock market while runs test, Autocorrelation Function, and advance tools such as ARCH andGARCH models and Hurst Index to provide further evidence of the weak form efficiency of the Bahrain stock market.For instance, a volatile and inefficient stock market has a negative impact on textile and apparel industry in the Kingdomof Bahrain, which is one of the most prosperous and attractive industries in the country. The empirical results revealedthat Bahrain stock market does not follow normal distribution and the successive price changes are not independent.Further, ARCH effect is significant and indicative of a time-varying conditional volatility. There is an arbitrage opportunityand extreme mispricing in the Bahrain stock market as indicated by the GARCH (1, 1) model. The results of the Hurstexponent also confirm the inefficiency of the market. The results of these tests are consistent indicating that the Bahrainstock market is inefficient.

** Full paper: Industria textile, https://:doi:10.35530/IT.071.05.1732, Vol. 71, Issue No. 5, 2020, pp 458-466.*

The Impact of Risk Anomalies on the Pharmaceutical Sector of the Indian Stock Market: A comparative analysis between pharmaceutical, FMCG and IT companies

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ABSTRACT

The main purpose of this research article is to provide a comparative framework on various implications of risk anomalies on Indian stock market based on an empirical study for the following sectors: Pharmaceutical, Fast-Moving Consumer Goods (FMCG) and IT. Risk anomaly is a notable anomaly because it is continual and all-inclusive. This research study aims to examine the existence of risk anomaly in the National Stock Exchange, India, and in particular providing a comparative analysis on the behavior of the pharmaceutical sector in India.

** Full paper: Revista de Chimie, https://doi.org/10.37358/RC.20.2.7892, Vol. 71, Issue No. 2, 2020, pp 57-63.*

Effect of Temperature on Stock Market Indices: A study on NSE and BSE in India

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ABSTRACT

This paper investigated the effect of weather (temperature) factor, on the returns and volatility of the Indian Stock Indices like BSE Sensex, BSE Metal, BSE Auto, BSE bank and CNX Nifty, Nifty Metal, Nifty Auto and Nifty Bank. The study used the daily data of five sample cities (Vishakapatnam, Surat, Bangalore, Pune and Jaipur) in India. This study applied the statistical tools like Descriptive Statistics, ADF Test and GARCH (1,1) model and found that the returns of sample indices were influenced by weather (temperature) factor in Vishakaptanam, Surat, Bangalore, Pune and Jaipur.

** Full paper: Anveshana, ISSN 2249-1449, Vol. 10, Issue No. 1, January – June 2020, pp 71- 87.*

Impulse Buying Behavior among Female Shoppers: Exploring the Effects of Selected Store Environment Elements

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ABSTRACT

This paper intends to analyze the impact of store layout, ambient factors, and employees on impulsive decision-making among female customers visiting the apparel outlets. The responses were collected through a single-stage mall intercept survey methodusing a structured questionnaire from 385 respondents in leading apparel stores inselected Tier I and Tier II cities in the state of Karnataka, India. The responses wereanalyzed using multiple regression analysis. Constructs such as store layout, ambienceand employees were found to be significantly positively correlated with impulse buying behavior. The variables largely explain the variation in impulse buying under storeambiance. Except 'attention to the window display' and 'friendly staff' all other twelvevariables considered in the study were found to have significant impact on the impulsebuying behavior. Though store ambiance, well-structured layout, and pleasant shopping experience are essential determinants of customer satisfaction, the study resultsimply that the number of store staff and sales skills are critical aspects of impulse buying in the apparel business and true assets to the retail organization. Additionally, poorcustomer interaction, staff shortage, and high employee attrition could discourage thestore's revenue generation.

**Full paper: Innovative Marketing, http: //dx.doi.org/10.21511/im., E-ISSN: 1816-6326, Vol 16, Issue No. 2, 2020, pp. 54-70.*

Entrepreneurial Skills and Intention of Graduate Students for Business Start-ups: A Survey from India

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ABSTRACT

Entrepreneurship triggers the economic condition of a country. Entrepreneurship increases the standard of living and has provided opportunities to improve the standard of living. There are several studies on the relationship between the entrepreneurial characteristics and entrepreneurial intention of students. There are very few studies on the need and importance of entrepreneurial skills over the entrepreneurial intention of graduate students. This paper concentrates on the 537 graduate students of science, commerce, and arts. The reason for selecting these students is to understand the level of involvement in entrepreneurial activity and their preparedness to take up entrepreneurship as a career. Hypotheses were tested with descriptive statistics, factor analysis and chi-square tests. This study helps to understand the willingness of students towards entrepreneurship. This paper focuses on the entrepreneurial skills required to equip graduate students to choose entrepreneurship as a career. The role of institutions in increasing the interest of students towards entrepreneurship.

*Full paper: *International Journal of Innovation, Creativity and Change, Vol. 14, Issue No. 3, 2020, pp 951-970.*

Self Help Groups (SHGs): A Profile Analysis

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ABSTRACT

The purpose of this article is to analyse the background information of the 766 members of the SHGs who have been interviewed through a structured schedule. Study has been confined to the selected SHG members of SKDRDP and NGVCT in the Mangalure District of Karnataka State in India. The analysis show that profiles are homogeneous to a great extent in terms of gender, importance, education, income levels, family size, farm size, and SHGs size, However, age and occupation showed heterogenous profile to a great extent. The study can be very useful for policy formulators and the researchers to take appropriate implications and conduct further enquiries on the socio-economic backgrounds of the SHGs.

**Full paper: International Journal of Advance and Innovative Research, Vol. 7, Issue No. 1 (XVII): January - March, 2020, pp.114-117.*

Financial Inclusion: Promotional Strategies and Challenges

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ABSTRACT

The purpose of this article is to analyse the promotional strategies and challenges of financial inclusion in India. The information has been collated from the various secondary sources in addition to an interview with 766 SHG members of SKDRDP and NGVCT in the Mangaluru district of Karnataka State in India. The analyses show that India has several unique and vast promotional platforms for deepening financial inclusion. However, there are several challenges coupled with the above promotional strategies. The study can be very useful for policy formulators and the researchers to take appropriate implications and conduct further enquiries on financial inclusion in India.

**Full paper: International Journal of Advance and Innovative Research, Vol. 7, Issue No. 1 (XVII): January - March, 2020, pp 108-113.*

Biogas from Cattle Dung as a Source of Sustainable Energy: A Feasibility Study

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ABSTRACT

Many studies have stated that the usage of traditional cooking fuels like firewood, dung, and coal has caused many unfortunate deaths in India. The alternative fuel sources like LPG and electricity are in scarce and. Today, researches in the area of biofuel or bioenergy are of prime interest to many researchers to contribute to sustainable energy sources. Bioenergy from cattle dung is one such area, particularly for a country like India where dairy farms is a major supplier of feedstock. In this study, using logistic regression methodology, we have analysed the socio-economic factors influencing the adoption of biogas digesters among dairy farmers in Karnataka, India. The study revealed that the number of cattle and family size are the key factors for biogas adoption and poor knowledge of the family size and cattle ratio is the key hurdle. Using cross-tabulation and some basic mathematical analysis, we concluded that the optimal number of cattle for one adult in a family is 1

Full Paper: International Journal of Energy Economics and Policy, Vol. 10, Issue No.6, 2020, pp 370-375.

Entrepreneurs in the World of Online Marketing

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ABSTRACT

The recent buzz in India is the wave of startups which have emerged over the past few years in the Indian economy. There are a great number of entrepreneurs who set up their vision and found their success path in the past few years. With the entrepreneurial wave the other popular topic or the current buzz in the market is created by the concept of online marketing. Over the years the concept of online marketing has gained a tremendous amount of popularity. It has become a part and parcel of the regular marketing concept and has turned out to be the most effective way to reach the masses. This paper will review the concept of entrepreneurs in the world of online marketing. Paper will be analyzing the various factors which will act as a spark for a person to transform himself/herself into the role of an Entrepreneur and the impact of online marketing in the same. This study uncovers that the present customers are progressively instructed about the items they purchase and they know about the changes in the present situation in such conditions it turns into a essential aspects for each startups to adapt the new techniques so as to comprehend the customer purchasing pattern so as to build up their products/ services in order to sustain in the market for a longer duration which is very essential in the era where there is a huge amount of competition between the startups.

**Full paper: International Journal of Advance Research (IJAR), ISSN: 2320-5407, Vol. 8 Issue No. 6, June-2020, pp.578-583.*

Quick tour of New Education Policy- 2020

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ABSTRACT

The NEP which was recently released by the government has garnered mixed opinions in the public, majority of it being the positive aspect yet there is some backlash happening. NEP2020 is it a sudden move of government like demonetization and implementation of GST?? Answer is No. There was a long overdue before the entire education system had to be changed since 1968 when the first education policy was introduced. There were certain amendments done to this policy over the years like 1986 and 1992 it was modified after that there were no amendments done. Last ground breaking event that took place in the field of education was the implementation of Right to education section 21A under the constitution where the age gap of 6 to 14 years of kids were provided with free education. So after the long gap of 34 years the NEP has come into picture.

The NEP was drafted by the committee headed by Dr. K. Kasturirangan.

The main objectives of NEP 2020 are based on three criteria which are as follows

- To improve the quality of education
- To increase the credibility of education system
- To address the gap that is existing in the current system

To achieve the very purpose of the education policy the HRD ministry of India has changed its name to Ministry of Education. The government is intending on increasing the GDP investment from 1.6% to 6% so that the result in gross enrolment ratio increases up to 50% by the year 2035. There is one question which is loitering in the minds of the general public, whether these changes are possible in the current state? The answer is yes, it is possible only when there is a dynamic change in the system towards the implementation of this policy. The entire policy concentrates on providing a holistic approach towards the education system rather than focusing on the same traditional approach of education. There is an equal amount of importance given to academics, vocational training and extra-curricular activities under this policy. The main focus of the policy is that interest of kids is kept under the consideration which is very essential to increase the enrolment number.

** Full paper: New Education Policy- An overview, ISBN 978-81-942871-9-3, edited by Dr. Subhatra, Dr. S. Krishnakumari, published by of by and for you publication, 2020, pp 113-116.*

Impact of Corporate Social Responsibility on Financial Performance of Select Sectors of Indian Stock Mark

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ABSTRACT

The Companies Act, 2013 made it obligatory for companies' to spend at least 2% of average net profits of 3 immediately preceding financial years on specified areas of social causes for the betterment of stakeholders and society in general. The present study examines the impact of CSR spending on financial parameters for six sectors, viz. Oil and Gas, Chemicals, Metals and Mining, Consumer durables, Pharmaceutical and Construction/Cement sector comprising of 30 companies' for six years 2014 - 2020. The results indicate that corporate social responsibility has an impact on financial performance of firms'. Further the impact is more evident for environmentally sensitive sectors than environmentally insensitive sectors.

**Full paper: RVIM Journal of Management Research, ISSN (print): 0974-6722, Vol. 13, Issue 2, July - December 2021, pp 18-25*

Shopping with Companions: Implications on In-Store checkout experience

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ABSTRACT

Shopping in retail stores is essentially a social experience. Prior research has focused extensively on the retail shopping experience, impulse buying tendency and shopper satisfaction. There exists a dearth of literature on companion shoppers and their influence on customers' overall shopping experience. Waiting is a pervading constituent of various purchase circumstances. Waiting attributes to encounter wide-ranging displeasing implications such as boredom, frustration, nervousness, stress, helplessness and occasionally even embarrassment. The purpose of this paper is to investigate the influence of a shopping companion on customers' impulse buying tendency and time perception at the retail checkout. The study follows a descriptive research design and surveyed 385 customers (respondents) accompanied by shopping companions visiting the selected retail outlets in Mangaluru district, Karnataka. The findings of the study show that there exists a positive association between the presence of companion shoppers, indicators of impulse buying tendency and perceived wait duration at the retail checkout. The paper highlights the social influences in an in-store purchase situation.

Full paper: Anveshana, Vol 11, Issue No. 2, July-December 2021, pp 2-17

Impact on Income and Savings during Covid19 pandemic: A Financial Literacy Study in Mangaluru city

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ABSTRACT

The present study explores the level of financial literacy by examining the awareness of financial instruments among respondents before and during COVID 19 in Mangaluru city. It also studies the impact of COVID 19 on the income, savings and spending. The study documents that there is a significant difference in the awareness of the financial instruments before and during COVID 19 pandemic. 36% of the respondents reported decrease in income while 44% reduced spending and consumption due to the pandemic. Further there is a significant association between occupation and income and savings of the respondents. The association between high usage of credit cards during pandemic and annual income of the respondent is also significant.

Full paper:Anveshana, Vol 11, Issue No 2, July-December 2021, pp 55-67

Antecedents of Behavioral Intention to Use Online Food Delivery Services: An Empirical Investigation

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ABSTRACT

The online food delivery market in India perseveres to grow at a sustained pace. The business has unique dynamics and challenges with the spike in orders during weekends, meeting delivery schedules during peak demand, offering deep discounts to address wavering customer loyalty, reducing cash burns, and managing food quality inconsistency. In contrast, the fast-paced life and the rise of millennials in the workforce is likely to assure a promising future for the food aggregators. The above backdrop has led the researchers to pursue this study. An empirical study was carried out to explore the consumption occasion and the antecedents of online food ordering in the select cities in Karnataka, India. The data was collected from 385 respondents through telephonic and mail survey using a structured questionnaire. The responses were analyzed using exploratory factor analysis and multiple regressions. The result of the study indicated a positive association between the constructs 'buying motives', 'aggregator attractiveness', and customer satisfaction. The variation in customers` satisfaction is largely attributable to the convenience of order placing, food quality, availability of food and restaurant reviews, offers and discounts, faster home delivery, and the wide choice of restaurants listed on the aggregator's website. Additionally, the aggregator attractiveness showed a higher impact on customer satisfaction as compared to buying motives.

Full paper: Innovative Marketing, Vol 17, Issue No.1, 2021, pp 1-15

Impulse Buying Behaviour at the Retail Checkout: An Investigation of Select Antecedents

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ABSTRACT

The remarkable growth of the Indian retail landscape over the last decade is reflected in the proliferation of supermarkets, departmental stores and hypermarkets in India. Evolving consumption patterns, raising living standards has sparked a huge demand in the food and grocery retailing. Impulse buying is a time-tested tactic by which retailers grab customer's attention and boost average purchase value. Prior research has deliberated extensively on impulse buying in the store and its determinants. However, little effort has been made to examine the impulse buying behaviour, particularly at the retail checkout. To bridge this gap, we conducted an empirical study in the leading food and grocery modern retail stores in selected Tier I and Tier II cities in the state of Karnataka, India. The data was collected from 385 respondents using a structured questionnaire. The responses were analysed using confirmatory factor analysis and multiple regression. Our study shows that impulse buying at the store checkout area is minimal and sporadic for most of the product categories at the checkout. Impulse buying at the checkout is instigated by factors such as store environment, credit card availability, momentary mood, in-store promotion, offers and discounts and large merchandise. The study has important implications for retail stores by emphasising on the choice of merchandise offered for sale at the checkout area. Further, the investigation reveals that Indian shoppers are health-conscious and cautious about their purchase at the checkout rather than being impulsive.

Full paper: Business: Theory and Practice, Vol 22, Issue No 1, 2021, pp 69-79

The Impact of Human Resource Accounting on the Financial Performance of Consumer Durable Companies Listed on NSE

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ABSTRACT

The current study examines the performance of top 40 companies based on market capitalization for the period of 5 years (2015-2019). Competitive advantage is measured using asset turnover ratio and profit margin and risk is measured using financial leverage. Book to market ratio is used as a measure of market performance of the firms. The results indicate that profit margin has the most significant impact on the market performance in the Indian stock market.

**Full paper: International Journal of Research in Management & Social Science , Vol 9, Issue 2 (I) April - June 2021, pp 169-171*

Competitive Advantage and Risk: Impact on Indian Stock Market

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ABSTRACT

The current study examines the performance of top 40 companies based on market capitalization for the period of 5 years (2015-2019). Competitive advantage is measured using asset turnover ratio and profit margin and risk is measured using financial leverage. Book to market ratio is used as a measure of market performance of the firms. The results indicate that profit margin has the most significant impact on the market performance in the Indian stock market.

**Full paper: Shanlax International Journal of Arts, Science and Humanities, Vol.9, Issue No.1, 2021, pp 75-79.*

Forecasting Areca Nut Market Prices using theArima Model: A Case Study of India

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ABSTRACT

India is the major producer of Areca nut in the world. Volatile demand and price are the major challenges for the Areca nut growers in India. The use of time series models to manage the price risk has become the interest of academicians today. This paper deals with developing an appropriate model to predict the prices of a new variety of Areca nut in Karnataka using monthly price data for the period January 2009 to December 2018. Box Jenkins ARIMA methodology is used to develop the model. Along with ARIMA estimates, log-likelihood, Akaike's information criterion (AIC) and Bayesian (BIC) information criterion statistics are also estimated to decide on the appropriate model. ACF and PACF correlograms for residuals of ARIMA are used to do the diagnostic check of the selected ARIMA model. Appropriate model to forecast the new variety Areca nut price is ARIMA (3, 1, 3).

**Full paper: Annals of the Constantin Brâncuşi University ofTârgu Jiu, Economy Series, Issue No 2, 2021, pp 4-18*

Introspective Parameter on Talent Management for Service and Manufacturing Industry Introduction

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ABSTRACT

Talent acquisition and management as a part of HR analytics is getting transformed with the emerging technology landscape, mobility, big data analytics, artificial intelligence and machine learning which are expected to cause a colossal shift in the way Talent management will be handled in future. Expectations and aspirations of the employees are increasing. There is severe competition between the companies to attract and retain the best talent irrespective of the situation. Thus, talent management acts as a vital HR tool in the organizations to reduce the cost and increase the efficiency. This paper takes interest in introspective parameter on talent management for service and manufacturing industry. The study has chosen Mangalore Chemicals and Fertilizers Limited (MCF) in manufacturing category and Diya Systems, Mangalore in software services category. The paper makes an effort to understand the relevant components responsible for talent acquisition and management in Diya Systems Mangalore and MCF Mangalore. Talent management in both the companies was not influenced either by the age or the gender of the employees. Present paper proposes a model of Talent Acquisition and Management followed by the observations and the endings.

**Full paper: Academic Discourse: An International Refereed Research Journal, Print ISSN: 2278-3296, Online ISSN: 2349-4441, Vol. 10, Issue No. 1, June 2021, pp 84-102.*

Consumer Buying Behaviour in the course of COVID-19

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ABSTRACT

The current pandemic has shaken the entire world. Every country is suffering economically due to the widespread COVID-19. India in the beginning had a better control over the situation due to lockdown and the strict measures but as the country moved towards the unlock phases there was an outburst in the numbers of infected people due to which there is a huge impact on the economical state of the country. Many business firms are suffering due to the pandemic. The pandemic has left a huge imprint on the minds of consumers as well. This paper is studying the consumer buying behavior pattern during the pandemic. The study showcases that there are various categories of consumers which have emerged due to the current situation and how the trend of business is shifting slowly towards the world of online business.

**Full paper: Modern Thamizh Research (A Quarterly International Multilateral Thamizh Journal), ISSN :2321-984X, Special Issue, 3 to 5 June, 2021, pp 706-715.*

Can Crude Oil Futures Be the Good Hedging Tool for Tyre Equities? Evidence from India

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ABSTRACT

This article examines the cross-hedging performance of crude futures against the tyre equity futures to hedge the tyre equity stocks. Three multivariate conditional volatility models, namely constant conditional correlation (CCC), dynamic conditional correlation (DCC) and diagonal BEKK are applied. Using the conditional covariance and variance from the MGARCH estimates, the optimal hedge ratios (OHRs) are computed. The results of this study show that the volatility spillover exists between the returns of crude oil futures and tyre equity. However, for tyre equities, the best cross hedge is tyre equity futures rather than crude futures. All the MGARCH estimates show better hedging possibility with tyre equity futures, particularly MRF futures.

**Full paper: International Journal of Energy Economics and Policy, DOI: https://doi.org/10.32479/ijeep.11863, Vol. 11, Issue No. 6, 2021, 523–537*

Crude Oil Futures to Manage the Price Risk of Natural Rubber: Empirical Evidence from India

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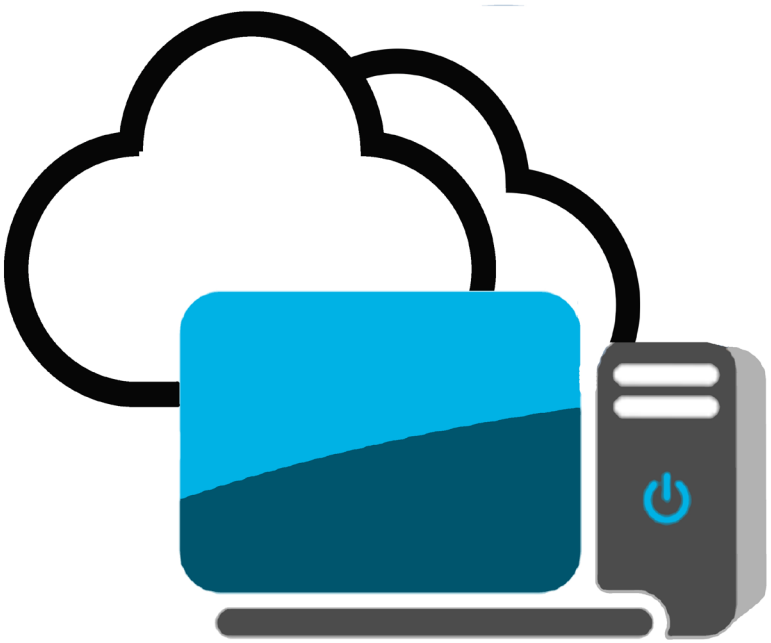
ABSTRACT

The trading of natural rubber derivatives in the Indian commodity exchanges was banned several times in the past. Hence, in India, the derivatives on natural rubber are not traded actively and regularly. We have examined the possibility of a forecast model and a cross hedge tool for the natural rubber price by using crude oil futures in India. Results of the Johansen cointegration test proved that there is no cointegration equation in the model; hence, there is no scope to develop long-run models or error correction models. We have developed a vector autoregressive [VAR(2)] model to forecast the rubber price, and we examined the possibility of a cross hedge for natural rubber further by using the Pearson correlation coefficient and Granger causality test. We have extended our research to a structural VAR analysis to examine the effect of crude futures and exchange rate shocks on the natural rubber price. Our results showed that there is a short-term relationship between the crude oil futures price, the exchange rates of the US dollar to the Indian rupee, the Malaysian ringgit to the Indian rupee and the Thai baht to the Indian rupee; and the natural rubber price in India. The effort of policymakers to cause the Indian rupee to appreciate against the Thai baht and Malaysian ringgit may increase the natural rubber price in India. Natural rubber traders, growers and consumers can use crude futures to hedge the price risk. The Indian Rubber Board can suggest the VAR(2) model to predict the short-run price for natural rubber.

**Full paper: Agricultural Economics – Czech, https://doi.org/10.17221/28/2021-AGRICECONC, Vol. 67, Issue No 10, 2021, pp 423–434.*



MASTER OF COMPUTER APPLICATIONS

Techniques for Measuring Attitudinal Learning Outcomes in Computer Science and Engineering

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ABSTRACT

Higher education globally, particularly the Computer Science and Engineering (CSE) in India is shifting to Outcome Based Education (OBE) which is an educational philosophy/theory that stresses on what a student would be able to do after an educational experience. Learning Outcomes (LOs), an important component of OBE are the actual measurable outcomes of any instructional event. Skill and attitudinal LOs are needed to be imbibed into domain dependent subject specific content, as per the principles of OBE. The paper elaborates experimental procedures in demonstrating techniques for imbibing 'Ethics', 'Engineer and Society' and 'Problem solving' the three delimited abilities as LOs. They are three of the 12 standards formulated by the Washington accord, as graduate attributes. The main objective of the paper is to demonstrate techniques for imbibing the three chosen competencies. Experimental methodologies were adopted and survey methods were used for validation of the studies. The domain considered for the experiments is 'Operating System', an important course of the CSE. Cognitive structure, a schema with mental constructs (pedagogical aspect), that uses knowledge structures which are logically organized instructional contents, is demonstrated by the experiments. Instructionally proved terms/phrases of chosen LOs along with the chosen domain dependent terms are integrated that imbibed the required skill and attitudinal competencies. Survey methods were adapted for executing the experiments with experimental group of student respondents and validated with teacher respondents. Conclusions are drawn, which will be of immense use to CSE educators and researchers. Keywords: Engineering Education, Knowledge and Cognitive Structure, Learning Outcome, Outcome Based Education; Skill and Attitudinal Competency.

**Full paper: International Journal of Engineering Research and Technology, ISSN 0974-3154, https://dx.doi.org/10.37624/IJERT/13.9.2020, Vol. 13, Issue No. 9, 2020, pp 2395-2401.*

Enhancing the Teaching-Learning Process through Collaborative Learning

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ABSTRACT

In the modern era, the education system has undergone a huge paradigm shift. Traditional classroom teaching methodologies that used to work like wonder, no longer attract the students of the present generation. Higher education, especially, engineering education has been greatly impacted by this paradigm shift and things are rapidly moving away from traditional methods to more advanced and innovative active learning strategies. Collaborative Learning is one of the popular forms of active learning and caters to the needs of millennial learners of today. This study deals with the impact of Team-Games-Tournament (TGT), which is one of the Collaborative Learning techniques. The outcomes of this small experiment clearly show that when Collaborative Learning is leveraged well, it surely results in better learning among the students.

**Full paper: Journal of Engineering Education Transformations, eISSN 2394-1707, Vol 33, Special Issue, January 2020, pp 185-191.*

Redefining Quality in Engineering Education through the Flipped Classroom Model

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ABSTRACT

The students in engineering institutes are expected to be tech-savvy and have an appetite for technology-based learning. Sadly, most of the courses in the current Indian engineering education scenario are taught using straight lectures where students are made to play a passive role while the teacher takes the center stage. The need of the hour is to get the students out of this passive mode of learning and bring them to the forefront in the teaching-learning cycle. Most often than not, teachers utilize the class time teaching technical intricacies that are crucial to solving problems which leave very little time to do anything else. Hence, the onus falls on the students to apply the learning in the class to solve problems on their own outside the classroom which is far from ideal. The flipped class is a model wherein much of the technical content is delivered outside the classroom via a virtual platform which in turn makes the classroom a congenial place for discussions, problem-solving and promoting active learning in the presence of the teacher. Through this paper, a study has been conducted to bring in this modern technology into engineering education. The objective is to analyze the power of technology in teaching courses that require significant work beyond class hours.

The flipped classroom model was applied on 32 final year Post Graduate students through the Android Mobile Application Development course. A fundamental topic was chosen that forms the base to build sophisticated Android Apps. Since it was very difficult to grasp the topic at one go, the class was flipped so that the students get ample time to go through the learning resources and come well prepared for the class. To begin with, the students were given the task of going through a lecture video from one of the NPTEL courses on Modern Application Development. However, the video shared was 22 minutes long and to simplify the learning experiences of students, a 3-minute Introductory video on the course content was shot and posted on the course website so that the students could first go through it before going into the actual learning material. During the lecture hour, an active learning strategy based on In-Class Teams was leveraged to drive home learning.

Practicing a disruptive tool like the flipped classroom model shifts the focus from the teacher to the students and assists in restoring the balance. By flipping the class, the students are expected to go through learning material employing self-study and then come prepared for the deliberations in the class. As students go through the gist of the course content in advance, it becomes easy for the teacher to turn into a facilitator and assist in students learning during the lecture hours. Through the assessment of student's interaction, preferences, and performance, the results of this study show that the students learn a whole lot better when technology is harnessed as opposed to the traditional classroom lectures.

Full paper: Journal of Procedia Computer Science, Volume 172, (2020), pp. 906–914.

Constructive Methodologies to Overcome the Technological Barriers in Online Teaching-Learning Process

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ABSTRACT

Over the past few years, technology-driven learning has gained a lot of momentum in every spectrum of education, more so in the field of engineering education. Most of the engineering educators often get inclined towards technology to deliver their courses effectively. While teachers have started leveraging Learning Management Systems (LMS) effectively, some of the technological innovations still need a little refinement. This study intends to explore the limitations of Canvas which is one of the popular LMSs being used today. Although Canvas is an excellent tool to manage the course content effectively and has proved to be very user friendly, it still has some nagging issues which have been analyzed through this study. The ways to overcome these limitations have also been put forth to ensure that the potential adopters of Canvas may have a seamless experience. The participants of the study were 56 second year Post Graduate students who were undergoing the course titled Professional Communication and Report Writing. A handful of students ran into unknown issues while taking up the Multiple- Choice Questions (MCQ) based quiz designed in the second module of the course. The issue was then traced, and corrective measures were incorporated to ensure that all students can take up the quiz. The analysis proved that MCQ quizzes developed on Canvas were not compatible with older versions of Android. Hence, students using such phones were unable to take up quiz-based assessments. To overcome this issue, the quizzes were dished out using tools like Google Forms, Kahoot, Quizizz, etc., and the links were posted on Canvas for the students to take up the quiz. While this approach worked relatively well, it was observed that each of these tools had their own set of limitations. In a nutshell, there is no technology that is perfect in all situations. In such circumstances, it is imperative that the course instructor takes centre stage and selects the technology that best suits a situation.

**Full paper: Journal of Engineering Education Transformations, Vol. 34, Special Issue ICTIEE, January 2021, pp. 707-712*

Effective Usage of Gamification Techniques to Boost Student Engagement

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ABSTRACT

Engineering Education, Learning Management System, Assessment, Technology, Online Teaching- Learning as the engineering education fraternity is getting accustomed to the new normal amidst the global COVID- 19 pandemic, online teaching has been gaining much attention in the recent past. While teachers are getting adjusted to this new way of teaching, it is paramount that the teaching-learning process caters to the needs of our millennial learners. Considering all these factors, the teacher must continuously work towards always keeping the students motivated. The authors of this paper brought in a series of innovative gamification constructs throughout a semester across multiple courses to gauge the level of involvement of students during the online lectures as well as the Learning Management System (LMS). The motive was the ensure that the students actively participate in all deliberations, thereby positively impacting the online learning process. The participants of the study were 56 second year Post Graduate students who were undergoing online classes. Several tasks, as well as assessments, were assigned to the students. While doing so, students were introduced to new gamification tools like Mentimeter, Edpuzzle, Kahoot, Quizizz and many more at regular intervals to break the monotony and keep them on their feet waiting for the next task to be performed. This not only meant that the students started participating in the classes more actively but also kept them engaged with a variety of innovative tools. The results clearly showed that the students started learning the concepts better while keeping competitive spirits. When it came to individual activities, there was an urge in students to outperform each other, which meant that the students would go that extra mile to get the things done. At the same time, team tasks had a high level of collaboration resulting in effective learning and building camaraderie. The students prefer learning through multiple sources and multiple platforms. By leveraging technological advancements and bringing in gamification in learning, the overall teaching-learning process gets highly benefited.

**Full paper: Journal of Engineering Education Transformations, Vol. 34, Special Issue ICTIEE, 2021, pp. 713-717*

An Efficient Image Pre-processing Technique for Land Use Analysis by Using Remote Sensing Images

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ABSTRACT

The advancement in remote sensing technology expands the choice of selection of images for land use mapping. Mapping, specific land use from remotely sensed images requires significant processing steps begins with image acquisition to classification using related algorithms. Useful properties of remote sensing images inherited with variety of errors requires some set of treatment in the form of pre-processing using various pre-processing techniques before the segmentation and classification of images. These pre-processing steps fine-tune the spatial and spectral feature of the data for future processing of the image. The residual characteristics of the image can be retained by calculating local mean and variance matching (LMVM) image fusion technique to retain the spectral information. The proposed study leverages the use of Just Noticeable Difference (JND) model to detect and map the edges of particular point of interest (POI) with reference to the luminance, contrast and structure of the remotely sensed image.

Full paper: International Journal of Advanced Trends in Computer Science and Engineering (IJATCSE), Vol.10, Issue No.01, January - February 2021, pp 308-315

Image Segmentation Techniques Using K-Means Clustering to Identify the Land Use Change Detection

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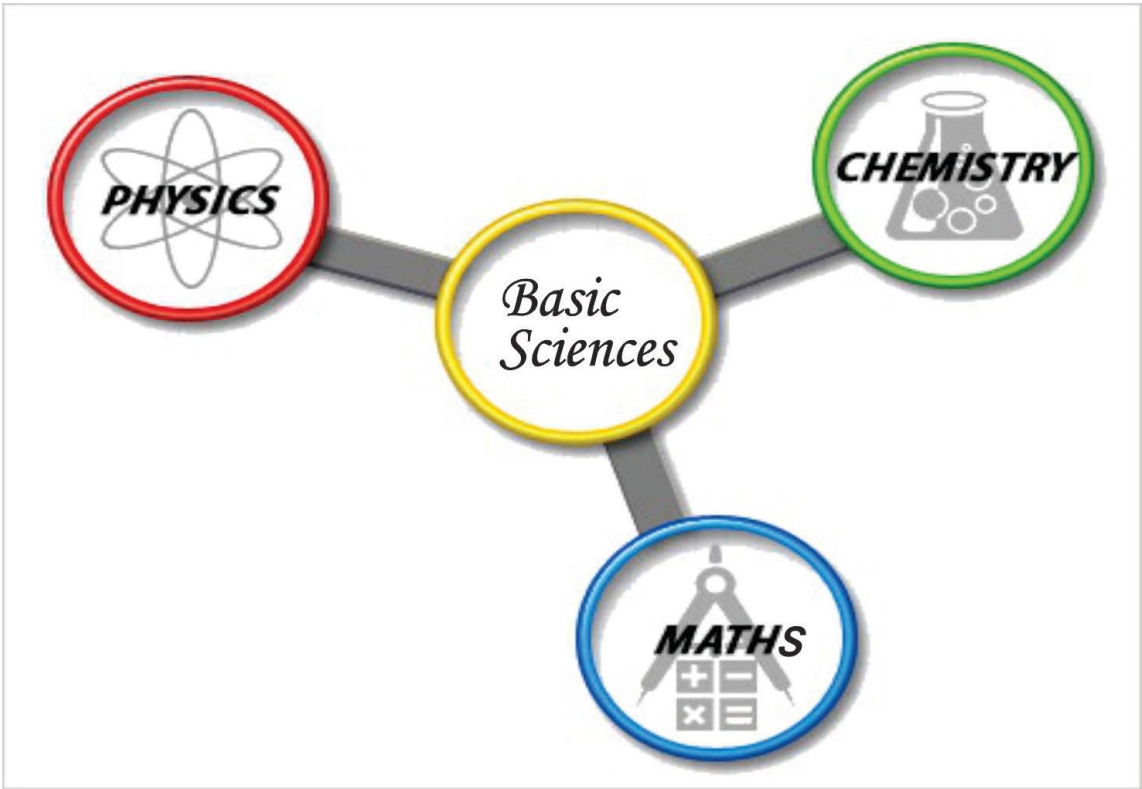
ABSTRACT

The change detection of the agriculture land and other land use is one of the important applications of remote sensing imagery.The major objective of this paper to measure the different boundary regionsof the land classes using an image segmentation technique. The initial categorizing of different land use classes is experimented by using k-means clustering, which basically clusters the point of interest with the pixel similarity. The measurement of the different pixel region represent the different classes of agriculture area is a challenging task with the real and synthetic images. The important characteristics of the algorithm preserves the cluster pixel details at most of the iterations, however for the similar canopy values the cluster effeminacy varies and the identification of the land clusters also deviates as compared with the ground truth data.

**Full paper: International Journal of Advanced Trends in Computer Science and Engineering (IJATCSE), Vol.10, Issue No.02, March – April 2021, pp 1200-1206.*


PHYSICS
CHEMISTRY
Basic Sciences
MATHS

Embedding of Concept Lattice into its Mixed Concept Lattice

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ABSTRACT

Formal Concept Analysis (FCA) is a method of analysis of object attribute relational data and knowledge representation. In this paper, the foundations of FCA are extended and in particular mixed concept lattices are studied in depth. We mainly focused on embedding property of a given lattice with respect to its mixed concept lattice. At the end of the article, we characterized the types of lattices which can be embedded in the corresponding mixed concept lattice.

**Full paper: Advances in Mathematics: Scientific Journal, https://doi.org/10.37418/amsj.9.7.9, ISSN: 1857-8365 (printed); 1857-8438 (electronic), Vol. 9, Issue No.7, 2020, pp 4389–4396*

A Framework for Student's Result Analysis Using Formal Concept Analysis

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ABSTRACT

For any educational institute, outcome based education (OBE) is the key tool of growth and success. To achieve this goal, it requires the performance of the students and analysis of their results. An independent analysis of students result gives precisely what is to be achieved through the proper attributes (subjects) and which helps to monitor progress towards those objectives (students). Formal Concept Analysis (FCA) is a method of analysis of object-attribute relational data and knowledge representation. In this paper a clear cut framework is established using the concept of FCA and lattice structure. This analysis provides the performance of students, which helps the institutes about their learning outcomes.

**Full paper: Journal of Critical Reviews, doi:10.31838/jcr.07.19.871, Vol. 7, Issue No. 19, 2020, pp 7649-7662.*

Effect of CuONanofiller on PVA/PVP Blend

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ABSTRACT

Polyvinyl alcohol (PVA)/Polyvinylpyrrolidone (PVP) (50/50) blends filled with various concentrations of Copper Oxide (CuO) nanofiller (0, 2 and 4 wt %) were prepared using solvent casting technique. The structural properties were carried out using XRD. The UV Visible studies reveal that the direct energy gap values declines with an increase in CuOnanofiller concentration in the blend. The surface morphology studies were carried out using atomic force microscope (AFM). The photoluminescence spectra measured at an excitation wavelength of 220 nm reveals that the intensity of the spectra increases with filler concentration .The mechanical properties measured using Universal testing machine (UTM) indicates enhancement in the properties upon addition of CuOnanofiller. These significant enhancements in the optical and mechanical properties of the blend upon addition of CuOnano fillers make it a potential material for device applications.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0019626, Vol. 2269, Issue No. 1, 12 October 2020, pp 030091-1–030091-6.*

Advancement in Structural, Morphological and Dielectric Studies of PVA filled TiO_2 and ZnO Nanocomposites

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ABSTRACT

In this article, we report advancement in structural, morphological and dielectric studies of PVA encapsulated titanium dioxide (TiO2) and zinc oxide (ZnO) nanoparticles. PVA/(x)TiO2(15-x)ZnO nanocomposites are prepared using solvent casting ex-situ technique for x= 0wt%, 1wt%, 5wt%, 7.5wt%, 10wt%, 14wt% and 15wt% filling concentrations. FTIR spectroscopy reveals the formulation of complexes between the PVA main chain and nano fillers is due to inter/intra molecular hydrogen bonding. The AFM picture shows the uniform grain structure for pure PVA and changes in surface morphology for prepared PVA nanocomposites. The morphological and homogeneous distribution of nanofillers in PVA nanocomposites was observed using SEM and EDAX. AC conductivity studies spectacles that the conductivity increases for different filling concentrations with increase in frequency. The frequency dependent dielectric constants with different filling concentrations are recorded.

**Full paper: AIP Conference Proceedings, https://doi.org/10.1063/5.0019630, Vol. 2269, Issue No. 1, 12 October 2020, pp 030092-1–030092-6.*

TiO2/ZnONanofillers in Tailoring the Morphology and Optical Properties PMMA for Optical Device Applications

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ABSTRACT

Nanofillers are defined as the fillers with particle size less than 100 nm, and polymer poly(methyl methacrylate) PMMA is a low-cost thermoplastic polymer with high transparency that can be easily processed and converted into the required form. Nanofillers play a vital role in improving the mechanical, electrical, optical properties of the host PMMA matrix. Further, these properties can also be tuned by including the combination of fillers with unique features. In the present study, ZnO and TiO2 nanofillers with different concentrations are integrated into the PMMA matrix on the glass substrate using a spin coating technique. A detailed characterization of the prepared films has been carried out to explore the properties. Scanning electron microscopy (SEM) studies signify the homogenous distribution and compatibility of nanofillers in host PMMA matrix. X-ray diffraction (XRD) investigations show the maximum crystalline complexity of 24.56 % crystallinity with a rise in filler concentration up to x=10 wt%. Raman spectroscopy findings demonstrate the influential transition peak identified at 840 cm-1 indicating a pivotal role in filler and matrix complex formulation. Optical studies show enhancement in transmittance with a rise in filler concentration up to 10 wt%, showing a maximum value of nearly 85%. The study also emphasizes the strong antireflection nature with decreased band gap value to 1.94 eV. The observed increase in optical conductivity suggests the number of free charges present in the nanocomposite films. The increase in optical conductivity with a reduced energy band gap of these PMMAInternational Conference on Advances in Material Science and Chemistry ICAMSC-2020

**Full paper: International Conference on Advances in Material Science and Chemistry, Kerala, 10th -12th August 2020.*

Enhancement in Structural and Optical Properties of PMMA-ZnO and TiO2 Filled Nanopatterns Hybrid Composites for Solar Cell Anti-Reflection Coating Applications

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[4]Manipal Institute of Technology, Manipal

ABSTRACT

PMMA based self-assembled hybrid nanopattern composite coatings that provide antireflective (AR) broadband light possess a high volume application. In this work, the optimization of the spin coating layer deposition of PMMA/(x) ZnO (15-x) TiO2 for diverse composition on the glass substrate is carried out. The XRD studies of the composites suggests the crystalline parameter enhancements from the amorphous towards the crystallinity with the rise in filler concentration up to x=10wt%. UV visible spectroscopy suggest The transmittance spectra of filled PMMA/(15-x) ZnO(x) TiO2 in comparison with undoped PMMA shows an enhancement in transmittance with rise in filler concentration up to 10wt% showing a maximum value of nearly 85% and reduction in energy gap up to x=10wt% filler concentration. The transparency found its enhancement at higher wave lengths when compared in the lower wave length region. The introduced TiO2 and ZnO nanoparticles form complexes with PMMA interpenetrating sporadic coils culminating in departed molecular mobility to create an interactive configuration. The high transparency PMMA/(15-x) ZnO (x) TiO2 for x=10wt% finds applicable in anti-reflection optical constituents in optoelectronic devices.

**Full paper: International Conference on Accelerating Innovations in Material Science, Department of Chemistry, BMS Institute of Technology and Management, Bangaluru, 4th-7th August 2020.*

The Effect of Electron Beam Treatment on the Third Order Nonlinear Optical Nature of the TPP Thin Film in Nano-Second Regime

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ABSTRACT

The impact of 8 MeV electron beam interaction on the third order nonlinear optical (NLO) properties of 5, 10, 15, 20 Tetraphrnyl 21H, 23H- porphine (TPP) thin films were probed by means of z-scan technique with pulsed laser operating at 6 ns and 532 nm. The thin films of thickness 120 nm were fabricated using thermal vapor technique on an ultrasonically cleaned glass substrate. The irradiation sensitive UV-Visible absorption spectrum and the corresponding impact on its optical band gap were explored. The unirradiated thin film depicts reverse saturable absorption NLO property attributable to triplet excited state absorption (T1→Tn). A switch over to saturable absorption was observed due to the induced localized structural defects when subjected to 2.5 kGy and 10 kGy e-beam irradiation dose. The closed aperture z-scan studies illustrates self-defocusing optical nonlinearity in both pristine and irradiated thin film owing to electronic and thermal lensing effects. The strong nonlinear absorption (NLA) and nonlinear refraction (NLR) coefficient values (β and n2) of TPP thin film provides prominence for device applications.

Full paper: DAE- Solid State Physics Symposium, BARC, Mumbai, 15 to 19 December 2021

Third Order Optical Nonlinearity in Amorphous TPP Thin Film at Nanosecond Regime

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[1]Department of Physics, St Joseph Engineering College,Mangaluru
[2]Deptartment of Physics, Mangalore University, Mangalagangothri, Mangaluru
[3]Laser Lab, School of Physics, University of Hyderabad, Hyderabad

ABSTRACT

The thin film of 5, 10, 15, 20-Tetraphenyl-21H, 23H-porphine (TPP) with the thickness of order of 120 nm was developed using thermal vapor deposition method over an ultrasonically cleaned glass substrate. The powder XRD analysis depicts a broad peak around 2θ = 25.9 0 indicating peaks at near UV and visible region due to π-π* orbital transitions. The third order nonlinear optical properties of TPP thin film were probed by means of Z-scan technique at 532 nm and pulse width of 6 ns. The open aperture z-scan illustrates strong reverse saturable absorption in the thin film due to triplet excited state absorption process. The closed aperture z-scan analysis of the thin film depicts self-defocusing effect attributable to the culmination of electronic and thermal nonlinearity. The derived values of nonlinear absorption coefficient and nonlinear refractive index are β = (1.28±0.06) × 10-5 m/W and n2 = (8.48±0.42) × 10-12 m2/ respectively. The obtained results indicate that the thermally evaporated TPP thin film is a potential candidate for current generation nonlinear optical device fabrication.

**Full paper: National Conference on Condensed Matter Physics and Applications, MIT, Manipal, 16 to 17 September 2021.*

Structural and Optical Study of Metal Oxide Filled Polymer Blend

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[1]Department of Physics, St. Joseph Engineering College, Mangaluru

ABSTRACT

PVA/PVP Polymer blends filled with various concentrations of ZnOnanofillers were prepared using solvent casting technique. The FTIR and XRD studies confirm the formation of polymer nanocomposites through the interaction taking place between the nanoparticles and the polymer. The optical energy gap of the nanocomposite films decreases with increase in wt% of ZnO. The photoluminescence study reveals that the intensity of the peak is maximum for a doping concentration of 8% ZnO. The dielectric studies indicate the variation of electrical conductivity of the films with addition of ZnO. The UTM studies reveal the enhancement of mechanical strength of the blends with addition of ZnO nanoparticles. Thus physical properties of PVA/PVP blend films are enhanced upon the addition of ZnO.

**Full paper: Newest Updates in Physical Science Research DOI:0.9734/bpi/nupsr/v10/7683D, chapter7, Vol. 10, 14 July 2021, pp 80-92*

Experimental and Computational Studies of N-(4, 6-Dimethylpyrimidin-2-yl)-4-[(quinazoline-4-yl) amino]-benzene-1-sulfonamide as an Effectual Corrosion Inhibitor for Mild Steel in Hydrochloric Acid

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[2]Department of Chemistry, National Institute of Technology Karnataka, Surathkal, Mangaluru

ABSTRACT

Abstract—The inhibition efficacy of N-(4,6-dimethylpyrimidin-2-yl)-4-[(quinazoline-4-yl)amino]benzene-1-sulfonamide (DMQS) as a new corrosion inhibitor on mild steel (MS) in 0.1 M HCl medium at varied temperature has been analysed and it has ensued 97.6% high efficiency at 4×10^{-5} M of DMQS. The electrochemical techniques employed were impedance spectroscopy and potentiodynamic polarization. Surface analysis of MS was carried out through scanning electron microscopy (SEM) and energy dispersion spectroscopy (EDS). Inhibitory effect of DMQS escalated with elevated concentration and declined with elevation in solution temperature. The adsorption of DMQS on MS has consent with the Langmuir adsorption isotherm. The computational study using density functional theory (DFT) with the B3LYP/3-21G basis set level for DMQS was investigated through the association between their molecular and electronic structure. The parameters involved in quantum chemical calculations were energy gap, EHOMO, ELUMO, absolute electro negativity, electro philicity, softness, global hardness, energy gap, ionization energy, electron affinity and dipole moment. DMQS shows EHOMO value of –6.256 eV, fortifying MS from corrosive attack and implicating it to be an effectual inhibitor. The results of the implemented studies show the corrosion inhibition efficiency of the DMQS is in good accord.

**Full paper:* *Russian Journal of Chemistry, ISSN 1070-4272, Vol. 94, Issue No. 8, 2021, pp. 1122–1133.*

CENTRAL LIBRARY

Research Publications Trend of St Joseph Engineering College, Mangaluru, Karnataka: A Bibliometric Study

Felcy Dsouza[1]

[1]Librarian, St Joseph Engineering College, Mangaluru

ABSTRACT

The study examined the bibliometric analysis of the research publication output of the St Joseph Engineering College (SJEC), Mangaluru indexed in Scopus during 2004 to 2019. The parameters such as the growth of publications, authorship pattern, author productivity, degree of collaboration, major areas of contribution, most preferred journals, geographical distribution etc are studied to attain the objectives. The findings revealed that, among the 230 publications published during the period of 16 years, highest numbers of 50 papers were published in the year 2019. The conference proceedings were the most preferred channels of publications followed by journals. There is an increasing trend in the number of publications 195 (84.8%) during the second half period. i.e., from 2012 to 2019. The rate of degree of collaboration is 0.97. The collaborative research by three authors published more articles and 37 publications have collaborated with foreign countries. The "Journal of Molecular Structure" is preferred as the most popular journal by the authors whereas the Journal of "Knowledge-Based System" ranked first having highest impact factor amongst other journals. The study reveals that SJEC has especially contributed to the research in computer science, engineering, physics and astronomy, material science, chemistry, mathematics, medicine, business management and accounting, energy and decision science.

**Full paper: Library Philosophy and Practice (e-journal), 4924, winter 1-7, 2021, pp 1-20.*

Awareness and Use of Open Educational Resources: A study

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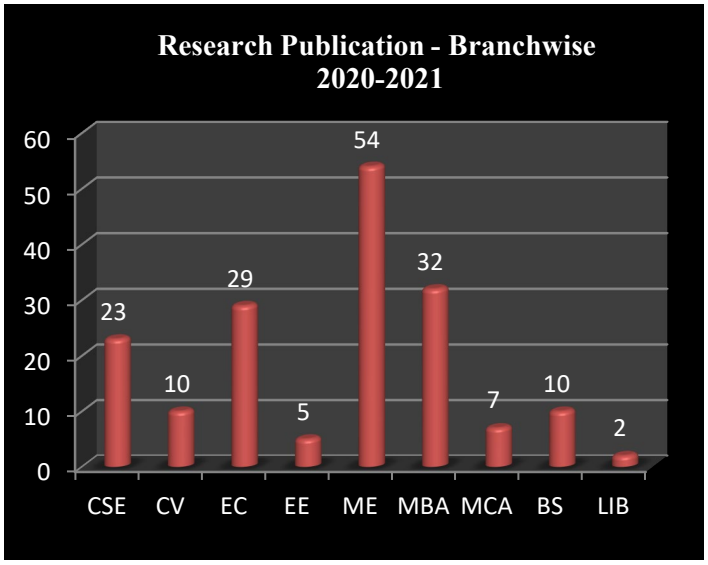
[1]Librarian, St Joseph Engineering College, Mangaluru

ABSTRACT

Understanding the awareness and use of Open Educational Resources (OER) among the stakeholders of academic libraries is a vital step to support the growth of OER initiatives at the educational institutions. The faculty and students' perceptions of OER often influence their interest in adopting open educational practices and their willingness to seek support from library professionals. To explore the awareness and the utilization of OERs among the faculty and students at St Joseph Engineering College (SJEC), Mangaluru, Karnataka, the author employed a survey to discover the responses to fulfill the study objectives. A total of 250 questionnaires were distributed among the faculty and students and 174 responses which amounts to 69.6% were received. The study found that 46 (26.44%) respondents use open educational resource daily, 38 (21.84%) respondents use open educational resource weekly, 81(46.55%) respondents open educational resources twice in a week, 9 (5.17%) respondents use open educational resource monthly. The main purpose of using OERs is to enable online education and its ease of use. The study investigated that, the faculty and students who are aware of the OERs through library support services and institutional OERs initiatives are utilizing it more effectively regardless of their prior experience in using electronic resources. Based on the study, it is suggested that academic libraries and faculty should help in promoting the awareness, so that the students fully utilize the OERs freely available online.

Full paper: Library Philosophy and Practice (e-journal), 6570, winter – 11, 2021, pp 1-11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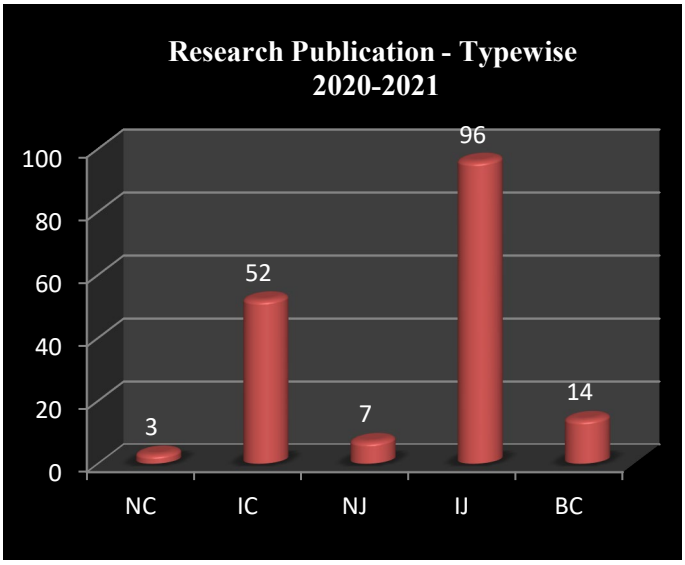
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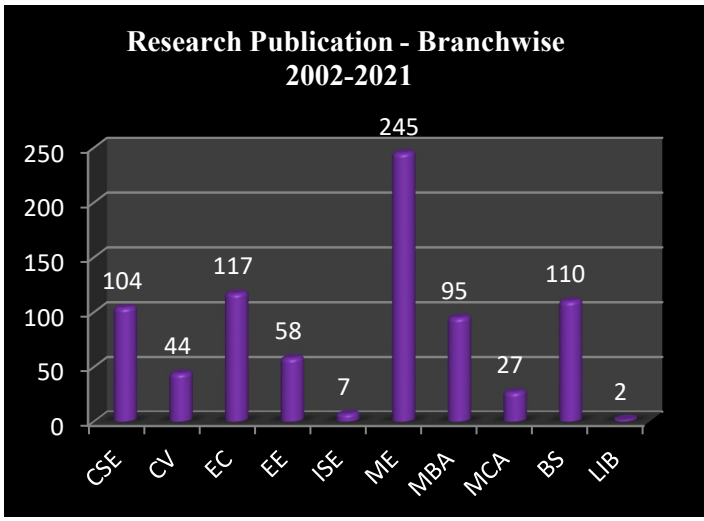
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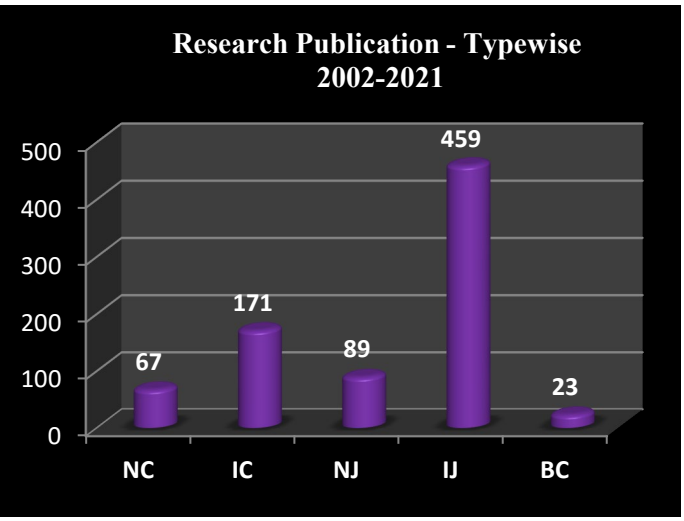
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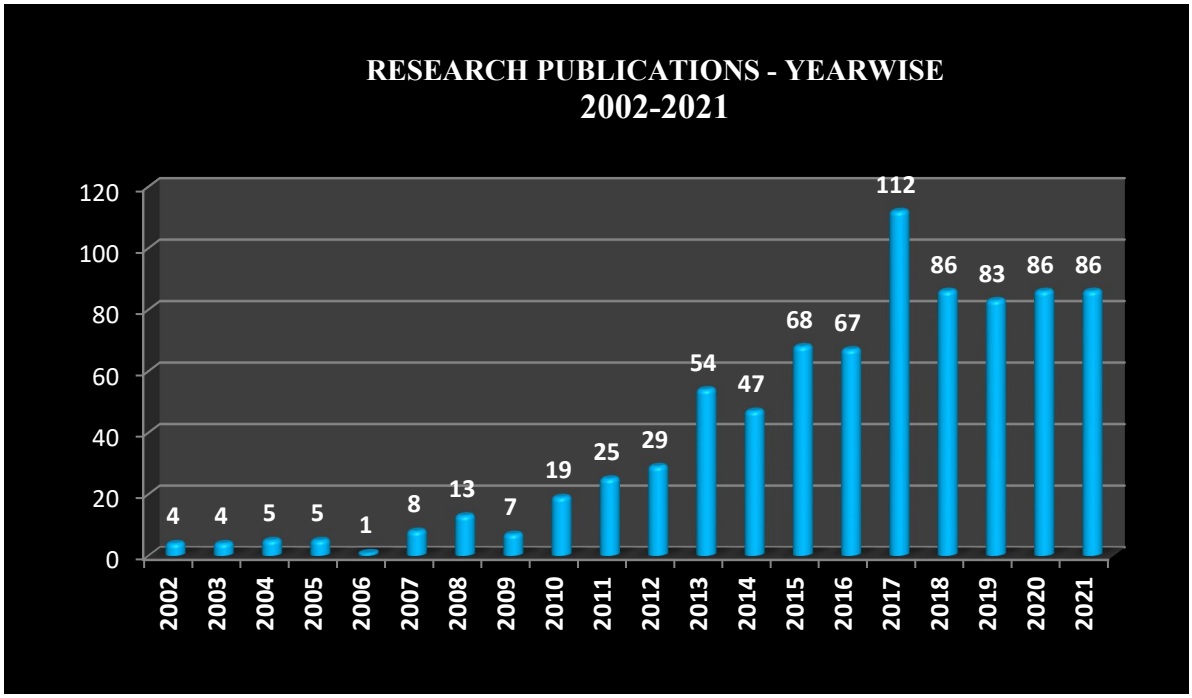
RESEARCH PUBLICATIONS - YEARWISE
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