A COMPENDIUM OF RESEARCH PUBLICATIONS 2002-2011

VOL - I (Part - I)

St Joseph Engineering College

[Affiliated to Visvesvaraya Technological University, Belagavi]

Vamanjoor, Mangaluru - 575 028, India

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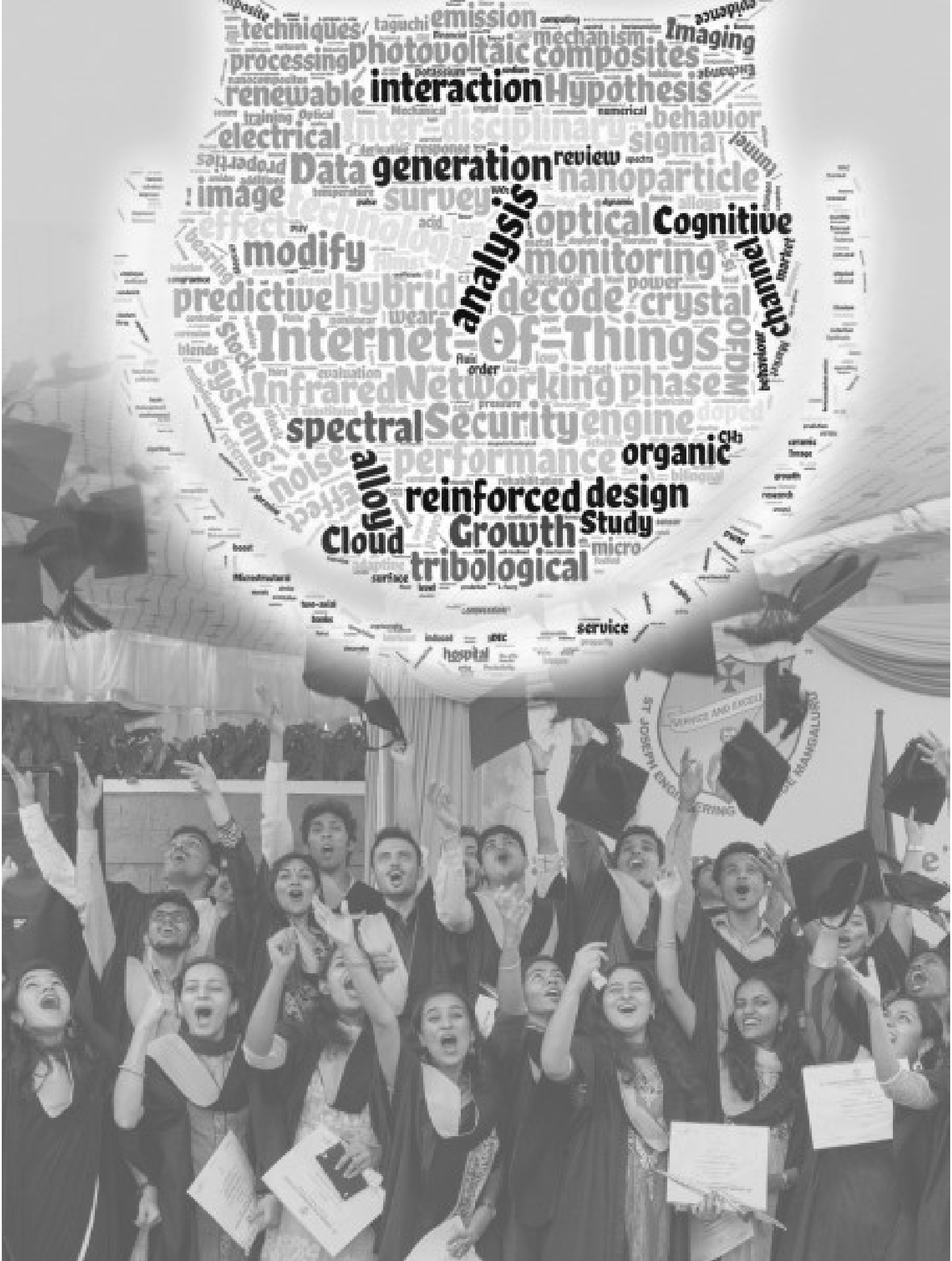
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ST JOSEPH ENGINEERING COLLEGE

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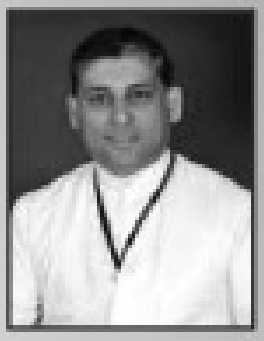
2017

Published By

ST JOSEPH ENGINEERING COLLEGE

MESSAGE



I am indeed delighted to know that St Joseph Engineering College in its academic pursuit is bringing out the Compendium of Research Publications. This is the first publication of the Compendium, gives the abstracts of the research publications and papers presented by the faculty members and research scholars of various departments in national/international journals, conferences/seminars and books during 2002-2016.

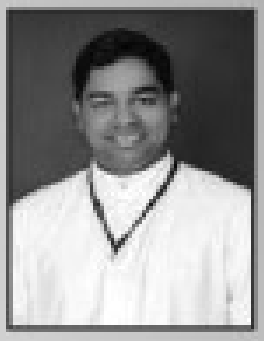
I know that publishing such compendium will enrich the knowledge transfer and motivate the faculty to engage into deeper research that can enhance the quality. My sincere appreciation to all of them for their contribution to this Compendium.

I thank Dr Nalini Rebello - Chairperson, Library Advisory Committee, Dr Felcy D'Souza – Librarian and all the members of the Editorial Board for their tremendous efforts in compiling and bringing out this Compendium which, I am sure, is going to be a resource material for researchers and students in future.

We assure you our continued support. May our faculty be passionate in engaging into more research activities and contribute to the incredible growth of SJEC with quality, excellence and service.

Fr Joseph J Lobo
Director – SJEC

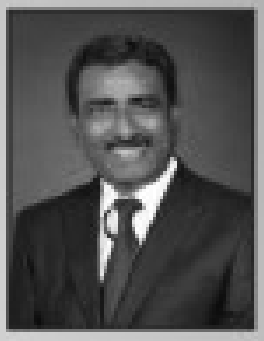
MESSAGE



Congratulations to the Editorial Board for bringing out the Compendium of Research Publications of our Faculty and Research Scholars. It's the best way to showcase the research work and at the same time, make it available to the young faculty who are in their initial stage of research. I thank the faculty for their generosity in sharing their work. The success of the compendium depends on its usage. So I request all to utilize this book and seriously get into research work and publication of papers. This indeed helps one to become more effective in teaching and to enhance the knowledge of our students.

Rev Fr Rohith D'Costa
Asst Director– SJEC

MESSAGE



It was a long desire to bring out a Compendium of Research Publications by the faculty members and research scholars of the college. Faculty members and research scholars of our college have been publishing research finding at various forums such as Journals and Conferences. The appreciable fact is that some of the papers are being published in journals pertaining to Science & Technology having good impact factor. It was felt necessary to bring all published works to be available in one single resource for the benefit of research scholars and the result is the Compendium of Research Publications of SJEC. Among the teaching faculty there are many accomplished researchers actively engaged in research which cover Engineering, Science, Mathematics and Business Administration. Therefore this Compendium will be a storehouse of knowledge and trust that this resource will help many research scholars of the college or otherwise.

I thank the Chairman, Library Advisory Committee- Dr. Nalini Rebello, Dr. Felcy D'Souza- the Librarian, all the members of the Editorial Board for their efforts in bringing out this Compendium. I also thank all the authors who have contributed their research papers to this Publication.

Dr Joseph Gonsalvis
Principal SJEC

MESSAGE

Though "Publish or Perish" has its own perils and pitfalls, there is no denying that it has spurred the otherwise dour and dormant academic community into an active endeavor to survive and remain relevant. "Quality through Quantity" seems to be the buzzword these days! Whatever may be the downside of this current emphasis on publishing research, one must appreciate that an effort to integrate research publications of staff of an institution is definitely a noble undertaking.

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
Vice Principal SJEC

EDITORIAL

This compendium presents the abstracts of the research publications and papers contributed by our faculty members and research scholars of various departments. The purpose of publishing this compendium of research publications is to disseminate, in convenient form, the research publications of our Institute and also to make it available a source of reference to the budding research scholars and students. The Full texts of these abstracts are published in reputed national/international journals, conference/seminar volumes, books and book chapters. Since the number of publications is too large to be included in one single volume, the first volume is published in three parts namely Part I, II and III.

This Volume 1 compendium of research publications consists of the abstracts of the papers published during the period 2002-2016. We are very glad to mention that our distinguished faculty members and research scholars have published more than 185 papers in International Journals, nearly 47 papers in National Journals. More than 76 papers are presented in International Conference/Seminars and nearly 48 papers in National Conference/Seminars.

We thank the members of the Editorial Board for their contribution. We congratulate our distinguished faculty members and research scholars as well. Thanks to the Management of SJEC and Principal Dr. Joseph Gonsalvis, Vice Principal Dr. Rio D'Souza for their valuable advice, support and encouragement in bringing out this compendium.

EDITORIAL BOARD

CONTENTS

Papers Published 2002 – 2011

IJ-13	Dayananda Pai Shrikantha S Rao Rio D'Souza	Multiobjective optimization of surface grinding process by combination of response surface methodology and enhanced non-dominated sorting genetic algorithm	International Journal of Computer Applications, 36 (3), 2011, pp 19-24	13

ELECTRONICS AND COMMUNICATION ENGINEERING				
NC-1	Savitha H M	Finite impulse response filter using Chinese remainder theorem	Proceedings of the National Conference on Progress in VLSI Design and Testing, Bangalore, 2002, pp 206-209	14
IJ-2	Savitha H M Muralidhar Kulkarni	Performance evaluation of Turbo coded OFDM systems and application of Turbo decoding for impulsive channel	ICTACT International Journal on Communication Technology, 1(3), 2010, pp 175-183	15
IC-3	Savitha H M Muralidhar Kulkarni	An improved turbo decoding scheme for impulsive channel	Proceedings of the Fifth International Conference on Industrial and Information Systems, NITK, 2010, pp 135–139	16
IC-4	Savitha H M Muralidhar Kulkarni	Performance comparison of hard and soft-decision Turbo coded OFDM systems	Proceedings of the IEEE International Conference on Wireless Communication, Networking and Internet Security, China, 2010, pp 551- 555	17
IC-5	Savitha H M Asiya Hazareena Muralidhar Kulkarni	Image Transmission using SPIHT turbo-coded OFDM systems	International Conference on Advances in Information, Communication Technology and VLSI Design, PSG College of Technology, Coimbatore, 2010	18
NC-6	Shama B N Praveen Kumar S N Prasad	Implementation of specific functions of physical layer in wireless personal area network	National Conference on Information Sciences, Manipal Centre of Information Science, Manipal, 2011	19
IC -7	A A Bini M S Bhat P Jidesh	An adaptive total variation model with local constraints for denoising partially textured images	Proceedings of the International Conference on Graphic and Image Processing, International Society for Optics and Photonics, Philippines, Manila, 2011, pp 1-5	20
IC-8	A A Bini M S Bhat	Selective image smoothing and feature enhancement using modified shock filters	Proceedings of the International Conference on Electrical Engineering, Electronics, Computer, Telecommunications and Information Technology, Bangkok, Thailand, 2011, pp 991-994	21
IC-9	Savitha H M Muralidhar Kulkarni	A hybrid scheme for CFO cancellation in LDPC coded OFDM system	Proceedings of the International Conference on Information Technology, Electronics and Communications, Hyderabad, Andhra Pradesh, 2011, pp 168-172	22
IC-10	Savitha H M Muralidhar Kulkarni	ICI cancellation in coded OFDM system using improved sinc power pulse shaping	Proceedings of the International Conference on Recent Advances in Technology, Engineering, Management & Science Tinachengod, Tamilnadu, 2011, pp 291-295	23

ELECTRICAL AND ELECTRONICS ENGINEERING				
Sl. No.	**Author**	**Title of the Paper**	**Publication Details**	**Page No.**
IJ-1	Sheryl G Colaco Ciji P Kurian V I George Anitha M Colaco	Prospective techniques of effective daylight harvesting in commercial buildings by employing window glazing, dynamic shading devices and dimming control—A literature review	Building Simulation, 1(4), 2008, pp 279-289	24
IJ-2	Sheryl G Colaco Ciji P Kurian V I George Anitha M Colaco	Model based evaluation of exterior daylight illuminance distribution	Building Simulation, 2(2), 2009, pp 85-94	25
IJ-3	Sheryl G Colaco Ciji P Kurian V I George Anitha M Colaco	The implications of fluorescent lamp electronic ballast dimming—an experimental study	Energy and Power Engineering, 2 (1), 2010, pp 53-64	26
MECHANICAL ENGINEERING				
NC-1	Shreeranga Bhat Rodrigues L L L	Spiritual dimensions in management	National Conference on Modern Trends in Management, Gogte Institute of Technology, Belgaum, 2004	27
IC-2	K Raju A P Harsha S N Ojha	Investigation on spray processing of Al-Si alloys and their wear characteristics	Proceedings of the International Symposium for Research Scholar-08 on Metallurgy Materials Science and Engineering, IIT, Madras, Chennai, 2008, pp 657 – 662	28
IJ-3	K Raju S N Ojha A P Harsha	Spray forming of aluminum alloys and its composites: an overview	Journal of Materials Science 43 (8), 2008, pp 2509-2521	29
NC-4	Shreeranga Bhat N A Jnanesh Nagaprasad H	Lean six sigma: new system to obtain strategic strength & competitive advantage and profits for hospitals	National Conference on New Advances in Thermal, Design, Materials and Manufacturing Engineering, Malnad College of Engineering, Hassan, 2009	30
NC-5	Rolvin D'Silva Mohanan P	Influence of injection timing on the performance and emission characteristics of a CI engine fuelled with B20 blend of waste cooking oil biodiesel with dimethyl carbonate as fuel additive	National Conference on I.C Engines and Combustion, Bapuji Institute of Engineering & Technology, Davangere, 2009	31
IC -6	Rolvin D'Silva P Mohanan	Effect of diethyl ether in b20 waste cooking oil methyl ester on the emission characteristics of a C.I. Engine	International Conference on Frontiers in Mechanical Engineering, NITK, Suratkal, 2010	32
IC-7	K Raju A P Harsha S N Ojha	Effect of processing routes on the corrosion behavior of Al-Si alloys	Proceedings of the AMMMT - 2010 an International Conference on Advanced Materials Manufacturing Management and Thermal Sciences, SIT, Tumkur, 2010, pp 36	33

NC-8	K Raju A P Harsha S N Ojha	Effect of processing techniques on microstructure, wear and mechanical properties of Al-15Si alloy	Proceedings of the NMD–ATM–2010 48th National Metallurgists Day 64th Annual Technical Meeting, IISC, Bengaluru, 2010, pp 69	34
IJ-9	K Raju A P Harsha S N Ojha	Evolution of microstructure and its effect on wear and mechanical properties of spray cast Al-12Si alloy	Materials Science & Engineering A, 528, 2011, pp 7723 -7728	35
IJ-10	K Raju A P Harsha S N Ojha	Microstructural features, wear and corrosion behavior of spray cast Al-Si alloys	Proceedings of the Institution of Mechanical Engineers Part J: Journal of Engineering Tribology, 225, 2011, pp 151–160	36
IJ-11	K Raju A P Harsha S N Ojha	Effect of processing techniques on the mechanical and wear properties of Al-20Si alloy	Transactions of IIM, 64 (1&2), 2011, pp 1– 5	37
IJ-12	Binu K G Shenoy B S Rao D S Pai R	Stability characteristics of journal bearing systems lubricated with couple stress fluids using the non-linear transient approach	Journal of Tribology and Surface Engineering, 3(1-2), 2011, pp 51-66	38
IJ-13	Sachidananda H K Joseph Gonsalvis	Altered tooth-sum gearing for high contact ratio	International Journal of Engineering Research and Applications, 1(3), 2011, pp 1234-1241	39
IJ-14	Sachidananda H K Joseph Gonsalvis Prakash H R	High profile shift gearing using altered tooth-sum gearing	International Journal of Advanced Engineering Sciences and Technologies ,11(1), 2011, pp 1-7	40
MANAGEMENT AND BUSINESS ADMINISTRATION				
NJ-1	Anjali Ganesh	Quality training principle driver of attitude - a case study	Global Management Review, 1(3), 2007, pp 64-75	41
NJ-2	Anjali Ganesh	A study with respect to training programmes in banks: an opinion survey	ACRM-Journal of Business & Management Research, 2(2), 2007, pp 35-46	42
NJ-3	Prakash Pinto Balakrishna C H	Mergers and acquisitions: human and cultural issues	SCMS Journal of Indian Management, 3(4), 2007, pp 29-34	43
NJ-4	Anjali Ganesh	Motivating women to be self reliant through entrepreneurship: a case study with reference to Rudset Institute	Bhavishya - Journal of Future Business School, 1(2), 2007, pp 75-84	44
NJ-5	Anjali Ganesh	Disaster management- role of HRD	HRM Review, 8(8), 2008, pp 63-65	45
NJ-6	Anjali Ganesh	An overview of performance appraisal and employee training and development at Videocon Industries Limited, Mumbai	ACRM - Journal of Management Business and Research, 3(2), 2008, pp 4-9	46
NJ-7	Anjali Ganesh	Encapsulating skill development and attitudinal transformation in bank employees: training plays the key	Bhavishya - Journal of Future Business School, 2(2), 2008, pp 87-101	47
IJ-8	Anjali Ganesh	Communication skill: a powerful defence mechanism	FOCUS-The International Journal of Management, 4(2), 2008, pp 25-34	48
IJ-9	Anjali Ganesh	Training approach; a study with reference to New Generation Bank: ICICI Bank Ltd.	International Journal of Rural Development and Management Studies, 2 (2), 2008, pp 171-177	49

NJ-10	Anjali Ganesh	Internal vs. External training- an empirical study	AIM Explore-Journal of Management Awareness, 5(1&2), 2008, pp 50-57	50
NJ-11	Anjali Ganesh	Skill sculpting : an indispensable mantra	Prajnan, 37(2), 2008-2009, pp 137-159	51
NJ-12	Anjali Ganesh	Travails of trainers: some empirical evidences	Indian Journal of Development Research and Social Action, 5 (1&2), 2009, pp 215-220	52
NJ- 13	Prakash Pinto Rekha H Aranha	Psychological contract: theoretical dimensions, literature review and research agenda	Prabandhan: Indian Journal of Management, 2(5), 2009, pp 29-34	53
WPS-14	Babitha Rohit Varsha Rao	Credit risk model for agricultural loan portfolio: a study with reference to Karnataka Bank	St. Aloysius College- AIMIT, Working Paper Series, 1(2), 2011, pp 37- 44	54
NJ-15	Ajaya Prakash Pinto	Leveraging the power of differences: workforce diversity	SCMS Journal of Indian Management, 8(2), 2011, pp 27-39	55
MASTER OF COMPUTER APPLICATIONS				
IJ-1	Shashirekha H L Vanishree K S Sumangala N	Content and structure based classification of XML documents	International Journal of Machine Intelligence, 3(4), 2011, pp 376-380	56
IC-2	K M Kavitha Luis Gomes Gabriel Pereira Lopes	Using SVMs for filtering translation tables for parallel corpora alignment	Proceedings of the 15th Portuguese Conference in Artificial Intelligence, Lisboa, Portugal, 2011, pp 690-702	57
ENGINEERING CHEMISTRY				
IJ-1	B T Gowda K Jyothi J D D'Souza	Infrared and NMR spectra of arylsulphonamides,4-X-$C_6H_4SO_2NH_2$andi-X,j-Y $C_6H_3SO_2NH_2$ (X = H; CH_3; C_2H_5; F; Cl; Br; I or NO_2 and i-X,j-Y = 2,3-$(CH_3)_2$; 2,4-$(CH_3)_2$;2,5-$(CH_3)_2$; 2-CH_3, 4-Cl; 2-CH_3, 5-Cl;3-CH_3, 4-Cl; 2,4-Cl_2 or 3,4-Cl_2)	Zeitschrift für Naturforschung, 57a, 2002, pp 967-973	58
IJ-2	K R Bhat K Jyothi B Thimme Gowda	Mechanism of ruthenium(III) catalysed Tl(III) oxidation of di and trisubstituted phenols in aqueous acetic acid : a kinetic study	Oxidation Communications, 25, 2002, pp 117-141	59
IJ-3	M C Mary K Jyothi B Thimme Gowda	Chlorination of mixed substituted phenols by sodium hypochlorite in aqueous alkaline medium: a kinetic and mechanistic study	Oxidation Communications, 25, 2002, pp 92-101	60
IJ-4	B T Gowda K Jyothi J Kozisek H Fuess	Crystal structure studies on p-substitutedbenzenesulphonamides, 4-X-$C_6H_4SO_2NH_2$ (X = CH_3, NH_2 F, Cl or Br)	Zeitschrift für Naturforschung, 58a, 2003, pp 656-660	61
IJ-5	B Thimme Gowda K Jyothi N Damodara	Infrared, ^1H and ^{13}C NMR spectra of N,N-dichlorosarylsulphonamides, 4-X-$C_6H_4SO_2NCl_2$ (X = H, CH_3, C_2H_5, F, Cl or Br) and i-X, j-$YC_6H_3SO_2NCl_2$ (i-X, j-Y = 2,3-$(CH_3)_2$, 2,4-$(CH_3)_2$, 2,5-$(CH_3)_2$, 2-CH_3, 4-Cl, 2-CH_3, 5-Cl, 3-CH_3, 4-Cl, 2,4-Cl_2 or 3,4-Cl_2)	Zeitschrift für Naturforschung, 58a, 2003, pp 563-568	62

IJ-6	B T Gowda K Jyothi H Paulus H Fuess	^{35}Cl NQR and structural studies on substituted amides, $X_yC_6H_{5-y}NHCOR$ (X = H or Cl; y = 0, 1 or 2 and R = $C(CH_3)_3$, $CHClCH_3$, C_6H_5 or 2-ClC_6H_4)	Zeitschrift für Naturforschung, 58a, 2003, pp 225-230	63
IJ-7	B Thimme Gowda K L Jayalakshmi K Jyothi	Kinetics and mechanism of oxidation of dimethyl sulphoxide by mono and disubstituted N,N-dichloro-benzenesulphonamides in aqueous acid	Zeitschrift für Naturforschung, 58a, 2003, pp 787-794	64
IJ-8	B T Gowda K M Usha K Jyothi	Infrared, ^1H and ^{13}C NMR spectral studies on di- and tri-substituted N-aryl amides, 2,6-$X_2C_6H_3NHCOCH_{3-i}X_i$ and 2,4,6-$X_3C_6H_2NHCOCH_{3-i}X_i$ (X = Cl or CH_3 and i = 0, 1, 2 or 3)	Zeitschrift für Naturforschung, 59a, 2004, pp 69-76	65
IJ-9	N Damodara K Jyothi B Thimme Gowda	Kinetics and mechanism of oxidation of dimethyl sulphoxide by sodium salts of N-chloro-disubstituted benzenesulphonamides in aqueous acid medium	Oxidation Communications, 27, 2004, pp 167-176	66
IJ-10	K Jyothi B T Gowda	Synthetic, infrared, ^1H and ^{13}C NMR spectral studies on potassium salts of N-chloroarylsulphonamides	Zeitschrift für Naturforschung, 59a, 2004, pp 64-68	67
NJ-11	B Thimme Gowda K Jyothi N Damodara K L Jayalakshmi	Infrared spectra of N-aryl substituted amides 2/4-XC_6H_4NHCOR (R = H, CH_3, X_i, C_6H_5 or C_6H_5Cl; X = H, Cl or CH_3 & i = 0, 1, 2 or 3)	Journal of Indian Chemical Society, 82, 2005, pp 1-5	68
IJ-12	Manu Lahtinen Jyothi Damodara Poornima Upadhyaya Nonappa Erkki Kolehmainen	N, N, 4-trichlorobenzenesulfonamide, -crystal structure	Acta Crystallography, E63, 2007, pp o2905	69
IJ-13	B Thimme Gowda K Jyothi Sabine Foro J Kozisek H Fuess	Sodium 4, N-dichloro-benzene-sulfonamide sesquihydrate, -crystal structure.	Acta Crystallography, E63, 2007, pp m1644-m1645	70
IJ-14	B Thimme Gowda N Damodara K Jyothi	Kinetics and mechanism of oxidation of D-fructose and D-glucose by sodium salts of N-chloro-mono/ di-substituted benzenesulphonamides in aqueous alkaline medium,	International Journal of Chemical Kinetics, 37, 2007, pp 572-582	71
IJ-15	Manu Lahtinen Jyothi Damodara Poornima Upadhyaya Nonappa Erkki Kolehmainen	N-{4-[(3-methylphenyl)sulfamoyl]-phenyl}benzamide	Acta Crystallography, E67, 2011, pp o2866	72

Sl. No.	Author	Title of the Paper	Publication Details	Page No.
ENGINEERING MATHEMATICS				
NJ-1	S Parameshwara Bhatta Ramananda H S	A note on modular pairs and orthomodularity in posets	Journal of Indian Mathematical Society, 76, 2009, pp 11-18	73
IJ-2	S Parameshwara Bhatta Ramananda H S	On ideals and congruence relations in trellises	Acta Mathematica Universatis Comenianae, 2, 2010, pp 209-216	74
IJ-3	S Parameshwara Bhatta Ramananda H S	A note on irreducible elements in a finite poset	International Journal of Algebra, 4, 2010, pp 669-675	75
IJ-4	S Parameshwara Bhatta Ramananda H S	Natural extension of a congruence of a lattice to its lattice of convex sublattices	Archivum Mathematicum (Brno), 47, 2011, pp 133-138	76
ENGINEERING PHYSICS				
IJ-1	Vincent Crasta V Ravindrachary R F Bhajantri Richard Gonsalves	Growth and characterization of an organic NLO crystal:1-(4-methylphenyl)-3-(4-methoxy phenyl) -2-propen-1-one	Journal of Crystal Growth, 267(1-2), 2004, pp 129-133	77
IJ-2	V Ravindrachary Vincent Crasta R F Bhajantri Boja Poojari	Growth and characterization of chalcone derivative single crystal	Journal of Crystal Growth, 275(1-2), 2005, pp e133-e318	78
IJ-3	Vincent Crasta V Ravindrachary S Lakshmi S N Pramod M A Shridar J Shashidhara Prasad	Growth, characterization and crystal structure analysis of 1-(4-chlorophenyl)-3-(4-chlorophenyl)-2-propen-1-one	Journal of Crystal Growth, 275(1-2), 2005, pp e329-e335	79
IC-4	Vincent Crasta V Ravindrachary R F Bhajantri S Naveen M A Shridar J Shashidhara Prasad	Single crystal X-Ray diffraction, optical and micro hardness studies on chalcone derivative single crystal	Proceedings of SPIE, Volume 5935, Bellingham, 2005	80
IC-5	V Ravindrachary Vincent Crasta R F Bhajantri J Indira	Optical, dielectric and micro hardness studies on 1-(4-methylphenyl)-3-(4-methoxyphenyl) -2-propen-1-one: A nonlinear optical single crystal	Proceedings of SPIE, Volume 5935, Bellingham, 2005	81
NJ-6	R F Bhajantri V Ravindrachary A Harisha Vincent Crasta Suresh P Nayak Boja Poojary	Microstructural studies on BaCl2 doped poly(vinyl alcohol)	Polymer, 47(10), 2006, pp 3591-3598	82
NC-7	Rajesh Kumar P C V Ravindrachary Vincent Crasta	Optical and XRD studies of an organic single crystal	National Conference on Advanced Materials, Devices and Technologies, S V University, Thirupathi, 2008	83
NJ-8	R F Bhajantri V Ravindrachary Boja Poojary Ismayil A Harisha Vincent Crasta	Studies on fluorescent PVA+PVP+MPDMAPP composite films	Polymer Engineering and Science, 49(5), 2009, pp 903-909	84

IJ-9	Vincent Crasta V Ravindrachary P C Rajesh Kumar S Ganesh	Dielectric studies on swift heavy ions and electron irradiated organic single crystal	AIP Conference Proceedings, 1349(163), 2011, pp 163-165	85
NC-10	P C Rajesh Kumar Vincent Crasta V Ravindrachary K Janardhana	Optical, dielectric and second order non-linear properties of a chalcone	National Conference on Modern Trends in Science & Technology, MVIT, Moodbidri, 2011	86
IC-11	P C Rajesh Kumar V Ravindrachary K Janardhana H R Manjunath Vincent Crasta M A Sridhar	Crystal growth, NLO properties of a pseudo symmetric organic crystal	International Conference on Advanced Materials and its Applications, Kalasalingam University, Tamilnadu, 2011	87
IJ-12	Rajesh Kumar P C V Ravindrachary K Janardhana H R Manjunath Prakash K	Synthesis and characterization of organic NLO compound	AIP Conference Proceedings 1349(1291), 2011, pp 1291-1292	88
IJ-13	K Janardhana V Ravindrachary P C Rajesh Kumar Yogisha Bhoja Poojary K B Manjunatha Ismayil	Third order optical nonlinearity of a pyrazoline derivative	AIP Conference Proceedings 1349(1319) , 2011, pp 1319-1320	89
IJ-14	H R Manjunath P C Rajesh Kumar S Naveen V Ravindrachary M A Sridhar J Shashidhara Prasad Prakash Karegoudar	Growth, characterization, crystal and molecular structure studies of 1-(2-thiophen)-3-(2,3,5-trichlorophenyl)-2-propen-1-one	Journal of Crystal Growth, 327, 2011, pp 161-166	90
IJ-15	P C Rajesh Kumar V Ravindrachary K Janardhana H R Manjunath Prakash Karegoud Vincent Crasta M A Sridhar	Optical and structural properties of chalcone NLO single crystals	Journal of Crystal Growth 327, 2011, pp 161-166	91

SUMMARY OF PUBLICATIONS 2002-2011

ARTICLES	CSE	EC	EE	ME	MBA	MCA	BASIC SCIENCE	TOTAL
NC	-	2	-	4	-	-	2	8
IC	9	7	-	3	-	1	3	23
NJ	-	-	-	-	12	-	4	16
IJ	4	1	3	7	2	1	25	43
WPS	-	-	-	-	1	-	-	1
TOTAL	**13**	**10**	**3**	**14**	**15**	**2**	**34**	**91**

NC-National Conference, **IC**–International Conference, **NJ**- National Journal, **IJ**- International Journal
WPS-Working Paper Series

COMPUTER SCIENCE AND ENGINEERING

Memetic NSGA - A Multi-Objective Genetic Algorithm for Classification of Microarray Data

Praveen Kumar K [1], Sharath S [2], Rio D'Souza G [3], K Chandra Sekaran [4]

[1&2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[4] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru

ABSTRACT

In Gene Expression studies, the identification of gene subsets responsible for classifying available samples to two or more classes is an important task. One major difficulty in identifying these gene subsets is the availability of only a few samples compared to the number of genes in the samples. Here we treat this problem as a Multi-objective optimization problem of minimizing the gene subset size and minimizing the number of misclassified samples. We present a new elitist non-dominated sorting-based genetic algorithm (NSGA) called memetic-NSGA which uses the concept of memes. Memes are a group of genes which have a particular functionality at the phenotype level. We have chosen a 50 gene Leukemia dataset to evaluate our algorithm. A comparative study between Memetic-NSGA and another non-dominated sorting genetic algorithm, called NSGA-II, is presented. Memetic-NSGA is found to perform better in terms of execution time and gene-subset length identified.

Full paper: Proceedings of the 15th International Conference on Advanced Computing and Communications, ISBN: 0-7695-3059-1, DOI: 10.1109/ADCOM.2007.114, December 2007, Guwahati, India, pp 75-80

A Phenomic Algorithm for Reconstruction of Gene Networks

Rio G L D'Souza[1], K Chandra Sekaran[2], and A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

The goal of Gene Expression Analysis is to understand the processes that underlie the regulatory networks and pathways controlling inter-cellular and intra-cellular activities. In recent times microarray datasets are extensively used for this purpose. The scope of such analysis has broadened in recent times towards reconstruction of gene networks and other holistic approaches of Systems Biology. Evolutionary methods are proving to be successful in such problems and a number of such methods have been proposed. However all these methods are based on processing of genotypic information. Towards this end, there is a need to develop evolutionary methods that address phenotypic interactions together with genotypic interactions. We present a novel evolutionary approach, called Phenomic algorithm, wherein the focus is on phenotypic interaction. We use the expression profiles of genes to model the interactions between them at the phenotypic level. We apply this algorithm to the yeast sporulation dataset and show that the algorithm can identify gene networks with relative ease.

*Full paper: *International Journal of Biological and Life Sciences, ISSN 2073-0527, Vol 4, Issue No. 2, Spring 2008, pp 76-81*

Proactive Loss Prediction: A Solution to Problem of Packet Reordering in TCP

Pradhan B Umesh[1], Rio G L D'Souza[2]

[1] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[2] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru

ABSTRACT

Transmission Control Protocol (TCP) forms the heart of today's Internet. One of the bottlenecks to its performance is Packet Reordering, which happens due to various reasons like Multipath Routing, Parallel Forwarding, and Link level retransmissions. In this paper, we explore the problems associated with packet reordering and weaknesses in TCP congestion control algorithm pertaining to packet reordering. We propose a proactive mechanism to predict loss, based on previous history and continuous learning, which would enable the existing TCP to improve the probability of making correct decisions.

*Full paper: *International Conference on Computer Networks and Security, September 2008, Pune*

Improved NSGA-II Based on a Novel Ranking Scheme

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

Non-dominated Sorting Genetic Algorithm (NSGA) has established itself as a benchmark algorithm for Multiobjective Optimization. The determination of pareto-optimal solutions is the key to its success. However the basic algorithm suffers from a high order of complexity, which renders it less useful for practical applications. Among the variants of NSGA, several attempts have been made to reduce the complexity. Though successful in reducing the runtime complexity, there is scope for further improvements, especially considering that the populations involved are frequently of large size. We propose a variant which reduces the run-time complexity using the simple principle of space-time trade-off. The improved algorithm is applied to the problem of classifying types of leukemia based on microarray data. Results of comparative tests are presented showing that the improved algorithm performs well on large populations.

*Full paper: Journal of Computing, ISSN: 2151-9617, Vol. 2, Issue No. 2, February 2010, pp 91-95

Reconstruction of Gene Networks Using Phenomic Algorithms

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

The reconstruction of gene networks has become an important activity in Systems Biology. The potential for better methods of drug discovery and disease diagnosis hinges upon our understanding of the interaction networks between the genes. Evolutionary methods are proving to be successful in such problems and a number of such methods have been proposed. However, all these methods are based on processing of genotypic information. We present evolutionary algorithms for reconstructing gene networks from expression data using phenotypic interactions, thereby avoiding the need for an explicit objective function. Specifically, we implement the Phenomic algorithm and validate it for the reconstruction of gene networks. We also extend the basic phenomic algorithm to perform Multiobjective optimization for gene network reconstruction. We apply both these algorithms to the yeast sporulation dataset and show that the algorithms can effectively identify gene networks. Both the algorithms are validated for stability and accuracy in the reconstruction of gene networks.

Full paper: International Journal of Artificial Intelligence Applications, ISSN: 0976-2191, DOI: 10.5121/ijaia.2010.1201, Vol. 1, Issue No. 2, April 2010, pp 1-11

SGA Implementation Using Integer Arrays for Storage of Binary Strings

Pradeep Kanchan[1], Rio D'Souza[2]

[1&2] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru

ABSTRACT

The Simple Genetic Algorithm evaluates a group of binary strings on the basis of their fitness, performs crossover and mutation on them and tries to generate a group having maximum fitness. The usual method used for implementing the SGA is by using character arrays for storage of binary strings. But, this method has some disadvantages. The SGA implementation can be termed a success if the average fitness of the new generation is more than the initial average fitness. In this paper, we plan to implement the SGA using integer arrays for storage of binary strings. Then, we plan to compare the initial average fitness with the final average fitness so that the working of SGA can be verified. We have written the application such that varying population sizes can be given to check the correctness of the SGA algorithm.

*Full paper: *Proceedings of the Second International Conference on Machine Learning and Computing (ICMLC), IEEE Computer Society, DOI: 10.1109/ICMLC.2010.62, Bangalore, February 2010, pp 135-136*

A Time-Efficient Variant of the Non-Dominated Sorting Genetic Algorithm

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

Non-dominated Sorting Genetic Algorithm (NSGA) has established itself as a benchmark algorithm for Multiobjective Optimization. The determination of pareto-optimal solutions is the key to its success. However the basic algorithm suffers from a high order of complexity, which renders it less useful for practical applications. Among the variants of NSGA, several attempts have been made to reduce the complexity. Though successful in reducing the runtime complexity, there is scope for further improvements, especially considering that the populations involved are frequently of large size. We propose a variant which reduces the run-time complexity using the simple principle of space-time trade-off. The improved algorithm is applied to the problem of classifying types of leukemia based on microarray data. Results of comparative tests are presented showing that the improved algorithm performs well on large populations.

Full paper: Proceedings of the IFIP First International Conference on Bioinformatics, Bioinfo 2010, March 2010, Surat, pp 109

A Phenomic Approach to Genetic Algorithms for Reconstruction of Gene Networks

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

Genetic algorithms require a fitness function to evaluate individuals in a population. The fitness function essentially captures the dependence of the phenotype on the genotype. In the Phenomic approach we represent the phenotype of each individual in a simulated environment where phenotypic interactions are enforced. In reconstruction type of problems, the model is reconstructed from the data that maps the input to the output. In the phenomic algorithm, we use this data to replace the fitness function. Thus we achieve survival-of-the-fittest without the need for a fitness function. Though limited to reconstruction type problems where such mapping data is available, this novel approach nonetheless overcomes the daunting task of providing the elusive fitness function, which has been a stumbling block so far to the widespread use of genetic algorithms. We present an algorithm called Integrated Pheneto-Genetic Algorithm (IPGA), wherein the genetic algorithm is used to process genotypic information and the phenomic algorithm is used to process phenotypic information, thereby providing a holistic approach which completes the evolutionary cycle. We apply this novel evolutionary algorithm to the problem of elucidation of gene networks from microarray data. The algorithm performs well and provides stable and accurate results when compared to some other existing algorithms.

Full paper: Proceedings of the 3rd International Conference on Contemporary Computing (IC3 2010), Noida, In: S. Ranka et al. (Eds.), IC3 2010, Part I, CCIS 94, August 2010, pp 194-205

Inference of Gene Networks from Microarray Data through a Phenomic Approach

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

The reconstruction of gene networks is crucial to the understanding of cellular processes which are studied in Systems Biology. The success of computational methods of drug discovery and disease diagnosis is dependent upon our understanding of the biological basis of the interaction networks between the genes. Better modelling of biological processes and powerful evolutionary methods are proving to be a key factor in the solution of such problems. However, most of these methods are based on processing of genotypic information. We present an evolutionary algorithm for inferring gene networks from expression data using phenotypic interactions. The benefit of this is that we avoid the need for an explicit objective function in the optimization process. In order to realize this, we have implemented a method called as the Phenomic algorithm and validated it for stability and accuracy in the reconstruction of gene networks .

*Full paper: *Proceedings of the International Conference on Advances in Information and Communication Technologies (ICT 2010), Kochi, In: V. V. Das, R. Vijaykumar et al. (Eds.), CCIS 101, September 2010., pp 83-89*

A Multi-objective Neural-Genetic Hybrid Algorithm for Classification based on Microarray Data

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

Gene Expression Analysis through evolutionary methods is based primarily on the analysis of microarray datasets. The distinct nature of these datasets is their low ratio (typically less than 0.01) of number of records to number of attributes. Traditional data mining techniques do not perform very well in such cases. A Neural-Genetic hybrid algorithm is used here to overcome the performance bottleneck. The genetic algorithm generates subsets of genes, which are potential classifiers, and the neural network validates them. The stochastic yet robust nature of the genetic algorithm coupled with the nonlinear mapping presented by the neural network result in an effective strategy for mining classification rules. In addition, a multiobjective optimization strategy ensures that the gene subsets obtained offer a good balance between conflicting objectives such as accuracy and subset length.

**Full paper: Proceedings of the International Conference on Advances in Communication, Network and Computing (CNC), Calicut, IEEE Computer Society, DOI 10.1109/CNC.2010.92, October 2010, pp 372-377*

A Phenomic Algorithm for Inference of Gene Networks using S-Systems and Memetic Search

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

In recent years, evolutionary methods have seen unprecedented success in elucidation of gene networks, especially from microarray data. We have implemented the Phenomic Algorithm which is an evolutionary method for inference of gene networks based on population dynamics. We have used S-systems to model gene interactions and applied memetic search to fine tune the parameters of the inferred networks. We have tested the novel algorithm on artificial gene expression datasets obtained from simulated gene networks. We have also compared the results to those obtained from two other similar algorithms. Results showed that the new method, which we call as Phenomic Algorithm with Memetic Search (PAMS), is an effective method for inference of gene networks.

**Full paper: Proceedings of the 5th International ICST Conference on Bio-inspired Models of Network, Information, and Computing Systems, Boston, USA, 1-3 Dec. 2010, Springer-LNICST, pp 229-237*

A Multiobjective Phenomic Algorithm for Inference of Gene Networks

Rio G L D'Souza[1], K Chandra Sekaran[2], A Kandasamy[3]

[1] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru
[2] Department of Computer Science and Engineering, NITK - Surathkal, Mangaluru
[3] Department of Mathematical and Computational Sciences, NITK - Surathkal, Mangaluru

ABSTRACT

Reconstruction of gene networks has become an important activity in Systems Biology. The potential for better methods of drug discovery and of disease diagnosis hinge upon our understanding of the interaction networks between the genes. Evolutionary methods are proving to be successful in such problems and a number of such methods have been proposed. However, all these methods are based on processing of genotypic information. We have presented an evolutionary algorithm for reconstructing gene networks from expression data using phenotypic interactions, thereby avoiding the need for an explicit objective function. Specifically, we have also extended the basic phenomic algorithm to perform multiobjective optimization for gene network reconstruction. We have applied this novel algorithm to the yeast sporulation dataset and validated it by comparing the results to the links found between genes of the yeast genome at the SGD database.

**Full paper: Proceedings of the 1st International Workshop on Bio-inspired Approaches to Advanced Computing and Communications, Boston, USA, 1-3 Dec. 2010, Springer-LNICST, pp. 440–451.*

Multi Objective Optimization of Surface Grinding Process by Combination of Response Surface Methodology and Enhanced Non-dominated Sorting Genetic Algorithm

Dayananda Pai[1], Shrikantha S Rao[2], Rio D'Souza[3]

[1] Department of Aero and Auto Engineering, Manipal Institute of Technology, Manipal University, Manipal
[2] Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal
[3] Department of Computer Science and Engineering, St Joseph Engineering College, Mangaluru

ABSTRACT

The present study is focused on the multi-objective optimization of performance parameters such as specific energy (u), metal removal rate (MRR) and surface roughness (Ra) obtained in grinding of Al-SiC_{35P} composites. The enhanced elitist non-dominated sorting genetic algorithm (NSGA-II) is used to solve this multi-objective optimization problem. Al-SiC specimens containing 8 vol. %, 10 vol. % and 12 vol. % of silicon carbide particles of mean diameter 35μm, feed and depth of cut were chosen as process variables. A mathematical predictive model for each of the performance parameters was developed using response surface methodology (RSM). Further, an enhanced NSGA-II algorithm is used to optimize the model developed by RSM. Finally, the experiments were carried out to validate the results obtained from RSM and enhanced NSGA-II. The results obtained were in close agreement, which indicates that the developed model can be effectively used for the prediction.

Full paper: International Journal of Computer Applications (IJCA), ISSN 0975–8887, DOI 10.5120/4471-6267, Vol. 36, Issue No.3, Foundation of Computer Science, New York, USA, December 2011, pp 19-24

ELECTRONIS AND COMMUNICATION ENGINEERING

Finite Impulse Response Filter using Chinese Remainder Theorem

Savitha H M[1]

[1]Department of Electronics and Communication Engineering, NMAMIT, Nitte

ABSTRACT

In this work, the implementation of finite impulse response (FIR) filter is carried out using Chinese remainder theorem (CRT). To achieve high speed computation several carry-less method are possible. One such method is use of residue number system (also called CRT). Each number is defined as a set of residues of relatively prime module set. A unique property of such residues is that multiplication, addition, subtraction and several other calculations can be carried out in each modulus. This residue set can therefore be used to uniquely represent the output of the filter which forms the key to the design consideration. Early use of such filters was in RADAR filtration applications and such number systems have also been used recently in cryptography.

This work required to arrive at reasonable moduli by simulation, design small width multipliers and appropriate modulo circuits. The modules were designed by hand routing standard cells provided by Karmic using MAGIC. The cells were simulated using SPICE. Verification of the design was also completed using freeware tools.

**Full paper: Proceedings of the National Conference on Progress in VLSI Design and Testing (VDAT-2002), ISBN: 81-7484-061-3, Pheonix Publishing House Pvt Ltd, 2002, Bangalore, pp. 206-209*

Performance Evaluation of Turbo Coded OFDM Systems and Application of Turbo Decoding for Impulsive Channel

Savitha H M[1], Muralidhar Kulkarni[2]

[1&2]Dept. of Electronics and Communication Engineering, National Institute of Technology Karnataka, Surathkal

ABSTRACT

A comparison of the performance of hard and soft-decision turbo coded Orthogonal Frequency Division Multiplexing systems with Quadrature Phase Shift Keying (QPSK) and 16-Quadrature Amplitude Modulation (16-QAM) is considered in the first section of this paper. The results show that the soft-decision method greatly outperforms the hard-decision method. The complexity of the demapper is reduced with the use of simplified algorithm for 16-QAM demapping. In the later part of the paper, we consider the transmission of data over additive white class A noise (AWAN) channel, using turbo coded QPSK and 16-QAM systems. We propose a novel turbo decoding scheme for AWAN channel. Also we compare the performance of turbo coded systems with QPSK and 16-QAM on AWAN channel with two different channel values- one computed as per additive white Gaussian noise (AWGN) channel conditions and the other as per AWAN channel conditions. The results show that the use of appropriate channel value in turbo decoding helps to combat the impulsive noise more effectively. The proposed model for AWAN channel exhibits comparable Bit error rate (BER) performance as compared to AWGN channel.

Full paper: ICTACT International Journal on Communication Technology, Vol. 1, Issue No 03, September 2010, pp. 175-183

An Improved Turbo Decoding Scheme for Impulsive Channel

Savitha H M[1], Muralidhar Kulkarni[2]

[1&2]Department of Electronics and Communication Engineering, National Institute of Technology, Karnataka

ABSTRACT

This paper proposes a novel turbo decoding scheme for additive white class A noise (AWAN) channel. It compares the performance of turbo coded systems with Quadrature Phase Shift Keying (QPSK) and 16-Quadrature Amplitude Modulation (16-QAM) on AWAN channel with two different channel values- one computed as per additive white Gaussian noise (AWGN) channel conditions and the other as per AWAN channel conditions. The results show that the use of appropriate channel value in turbo decoding helps to combat the impulsive noise more effectively. Also, the Bit error rate (BER) performance of the proposed model for AWAN channel is compared with that of AWGN channel. It is observed that they exhibit comparable BER performance.

**Full paper: Proceedings of the Fifth International Conference on Industrial and Information Systems, (ICIIS 2010), NITK, India, Jul 29th - Aug 1st 2010, pp. 135-139*

Performance Comparison of Hard and Soft-Decision Turbo Coded OFDM Systems

Savitha H M[1], Muralidhar Kulkarni[2]

[1]Department of Electronics and Communication Engineering, St. Joseph Engineering College, Mangaluru
[2]Dept. of Electronics and Communication Engineering, National Institute of Technology Karnataka, Surathkal

ABSTRACT

This paper compares the performance of hard and soft-decision turbo coded Orthogonal Frequency Division Multiplexing systems with Quadrature Phase Shift Keying (QPSK) and 16-Quadrature Amplitude Modulation (16-QAM). The results show that the soft decision method greatly outperforms the hard-decision method. Using simplified algorithm for the soft-output demapper in the 16-QAM constellation, the complexity of the demapper is greatly simplified.

*Full paper: *Proceedings of the IEEE International Conference on Wireless Communication, Networking, and Internet Security (WCNIS), China, 2010, pp. 551-555*

Image Transmission using SPIHT Turbo-Coded OFDM Systems

Savitha H M[1], Asia Hazareena[2], Muralidhar Kulkarni[3]

[1, 2&3] Dept. of Electronics and Communication Engineering, National Institute of Technology Karnataka, Surathkal

ABSTRACT

In this paper, we propose a combined Set Partitioning In Hierarchical Trees (SPIHT) and Turbo Coded Orthogonal Frequency Division Multiplexing (TCOFDM) coding scheme for transmission of image over Additive White Gaussian Noise (AWGN) and multipath fading channels. It is shown through simulations that image transmission using TCOFDM is better suited for multipath channel as well as AWGN channel. Simulation results also show that there is a great improvement in the Peak Signal to Noise Ratio (PSNR) performance as the number of iterations increases for SPIHT-TCOFDM systems. A comparison of PSNR v/s E_b/N_0 (dB) performance shows superiority of SPHIT-TCOFDM systems over convolutional coded systems.

**Full paper: International Conference on Advances in Information, Communication Technology and VLSI Design, 2010, PSG College of Technology, Coimbatore*

Implementation of Specific Functions of Physical Layer in Wireless Personal Area Network

Shama B N[1], Praveen Kumar[2], S N Prasad[3]

[1]Department of Electronics and Communication Engineering, St. Joseph Engineering College, Mangaluru
[2]NITK-STEP, Surathkal, Mangaluru
[3]Department of Electronics and Communication Engineering, NMAMIT, Nitte, Karnataka

ABSTRACT

IEEE 802.15.4 defines the protocol and interconnection of devices via radio communications in personal area networks. The standard uses carrier sense multiple access with collision avoidance (CSMA-CA), which supports star topology. As the number of nodes is decreased, power efficiency of CSMA-CA is increased. Power efficiency is slightly improved in terms of throughput and block acknowledgement at the physical layer. The function of data scrambler and data whitener is analyzed in PHY layer.

Full paper: National Conference on Information Sciences, 29-30th April 2011, Manipal Centre of Information Science, Manipal (Best paper at NCIS 2011)

An Adaptive Total Variation Model with Local Constraints for Denoising Partially Textured Images

A A Bini[1], M S Bhat[2], P Jidesh[3]

[1]Department of Electronics and Communication Engineering, St. Joseph Engineering College, Mangaluru
[2]Department of Electronics and Communication Engineering, National Institute of Technology, Karnataka
[3]Department of Mathematical and Computational Sciences, National Institute of Technology, Karnataka

ABSTRACT

Denoising algorithms such as Total Variation model modify smooth areas in images into piecewise constant patches and small scale details and textures present in the original image are not preserved satisfactorily by these processes. In this paper, we present an algorithm based on an adaptive Total Variation norm of the gradient of the image, with a family of local constraints for efficient denoising of natural images. In fact, natural images consist of smooth and textured regions. Staircase effect is reduced in smooth areas by using a modified Total Variation functional. The set of local constraints, one for each pixel in the image are able to preserve most of the fine details and textures in the images. Visual and quantitative results of proposed method are presented and are compared with results of existing methods.

*Full paper: *Proceedings of the International Conference on Graphic and Image Processing, International Society for Optics and Photonics, 2011, Philippines, Manila, pp. 1-5*

Selective Image Smoothing and Feature Enhancement using Modified Shock Filters

A A Bini[1], M S Bhat[2]

[1]Department of Electronics and Communication Engineering, St. Joseph Engineering College, Mangaluru
[2]Department of Electronics and Communication Engineering, National Institute of Technology, Karnataka

ABSTRACT

Shock filters are widely used for image enhancement and deblurring. These filters make use of nonlinear hyperbolic Partial Differential Equations (PDEs) in order to sharpen the edges. However, in many practical cases images are corrupted by noise and other kind of degradations. Conventional shock filters are not suitable in such cases as they enhance the noise present in the image. Hence, the idea of combining shock filters with diffusion yield good results. In this paper we propose a modified "diffusion coupled shock filter." The proposed method makes use of an 'adaptive diffusion term' which limits the extent of smoothing on important edges making them sharper. The experimental results demonstrate the efficiency of the proposed method to control diffusion and to make the reconstruction more reliable.

**Full paper: Proceedings of the International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON), 2011, Bangkok, Thailand, pp. 991-994*

A Hybrid Scheme for CFO Cancellation in LDPC Coded OFDM System

Savitha H M[1], Muralidhar Kulkarni[2]

[1&2]Dept. of Electronics and Communication Engineering, National Institute of Technology Karnataka, Surathkal

ABSTRACT

The tremendous growth in the wireless communication area has placed a strain on the capacity of those systems. In the restricted RF spectrum available, spectral occupancy of digitally modulated communication signals becomes an important factor. Base band pulse shaping filters help to achieve better spectral occupancy. They also help in combating the ICI (Inter Carrier Interference) caused by CFO (Carrier Frequency Offset) in OFDM (Orthogonal Frequency Division Multiplexing) systems. MLE (Maximum Likelihood Estimation) is another technique available in the literature for reducing the undesired effects caused by CFO using CFO correction at the receiver. In this paper, we combine these two techniques to cancel ICI further in LDPC (Low Density Parity Check) coded OFDM system, thereby achieving a better BER (Bit Error Rate) performance than the BER achieved by either of the two above mentioned schemes. It has been shown that, for a normalized CFO of 0.2 and BER of 10^{-5}, around 0.82 dB BER performance improvement could be achieved using the new hybrid scheme as compared to MLE technique with low pass filtering, and around 2.55 dB BER performance improvement as compared to ISP (Improved Sinc Power) pulse shaping scheme. Further, the hybrid scheme adopted in this work can also be applied to larger CFOs, while pulse shaping scheme alone is not much suitable for larger CFOs.

**Full paper: Proceedings of the International Conference on Information Technology, Electronics and Communications (ICITEC), 29th-30th November 2011, Hyderabad, Andra Pradesh, pp.168-172*

ICI Cancellation in Coded OFDM System Using Improved Sinc Power Pulse Shaping

Savitha H M[1], Muralidhar Kulkani[2]

[1]Department of Electronics and Communication Engineering, St. Joseph Engineering College, Mangaluru
[2] Dept. of Electronics and Communication Engineering, National Institute of Technology Karnataka, Surathkal

ABSTRACT

The tremendous growth in the wireless communication area has placed a strain on the capacity of those systems. In the restricted RF spectrum available, spectral occupancy of digitally modulated communication signals becomes an important factor. Base band pulse shaping filters help to achieve better spectral occupancy. They also help in combating the inter carrier interference (ICI) caused by carrier frequency offset (CFO). In this paper, it has been shown that there is a significant performance improvement of OFDM systems, suffering from CFO, using improved sinc power (ISP) pulse shaping filter. A comparison of the performances of some popular pulse shapes has also been carried out. It is observed that ISP pulse shows much better performance than the other pulse shapes that have been considered. Further, the side lobe amplitudes are the least in case of ISP pulse. It is hence concluded that the ISP pulse shape is the best choice for ICI cancellation in OFDM systems.

**Full paper: Proceedings of the International Conference on Recent Advances in Technology, Engineering, Management & Science (ICRATEMS), 2011, Tiruchengod, Tamilnadu, pp. 291-295*

ELECTRICAL AND ELECTRONICS ENGINEERING

Prospective Techniques of Effective Daylight Harvesting in Commercial Buildings by Employing Window Glazing, Dynamic Shading Devices and Dimming Control-A Literature Review

Sheryl G Colaco[1], Ciji P Kurian[2], V I George[3], Anitha M Colaco[4]

[1]Electrical Engineering and Electronics Engineering, St. Joseph Engineering College, Mangaluru
[2]Electrical & Electronics Engineering, Manipal Institute of Technology, Manipal
[3]Instrumentation and Control Engineering, Manipal Institute of Technology, Manipal
[4]Electrical & Electronics Engineering, NMAMIT, Nitte

ABSTRACT

Over a few decades, daylighting has been perceived to possess good potential for energy conservation. In this perspective, there have been significant advances in research methodologies and technologies for optimizing energy consumption through daylight harvesting in commercial buildings. In light of this, a thorough understanding of the application of available technology is very important for daylighting practices for building energy management. The objective of this paper is to examine the status of published research on three key building parameters: window glazing area, dynamic shading devices, and daylighting controls playing a rule on energy conservation. This article may serve as a coherent literature survey that would provide better understanding of the subjacent issues and possibly rejuvenate research interest in this immensely potential field of energy engineering.

Full paper: Building Simulation, doi: 10.1007/s12273-008-8126-8, Vol. 1, Issue No. 4, 2008, pp. 279-289

Model Based Evaluation of Exterior Daylight Illuminance Distribution

Sheryl G Colaco[1], Ciji P Kurian[2], V I George[3], Anitha M Colaco[4]

[1]Electrical Engineering and Electronics Engineering, St. Joseph Engineering College, Mangaluru
[2]Electrical & Electronics Engineering, Manipal Institute of Technology, Manipal
[3]Instrumentation and Control Engineering, Manipal Institute of Technology, Manipal
[4]Electrical & Electronics Engineering, NMAMIT, Nitte

ABSTRACT

Energy conservation in buildings is greatly influenced by natural daylight in tropical region. A vital step towards development and promotion of daylighting technology in buildings is a prior study on estimation of exterior daylight availability for illuminating its interiors. In view of this, the present communication depicts the preliminary work progress carried out to arrive at a comprehensive idea on assessment of daylight availability and its characteristics. The study is reported taking the representative case of Bangalore (India) (latitude 12.97° N, longitude 77.56° E),which in future work facilitates to device suitable interior illuminance models and lighting controls for a daylight-artificial light integrated scheme. The objective of this paper is to document the estimation of spatial exterior daylight parameters like exterior horizontal as well as vertical global and diffuse daylight illuminance in addition to their respective luminous efficacies computed using an established analytical model. The paper also highlights user friendly computer simulation tool developed, for the detailed estimation of daylight availability at a particular region by the inclusion of corresponding solar radiation data.

**Full paper: Building Simulation, doi: 10.1007/s12273-009-9113-4, Vol. 2, Issue No. 2, 2009, pp. 85-94*

The Implications of Fluorescent Lamp Electronic Ballast Dimming: An Experimental Study

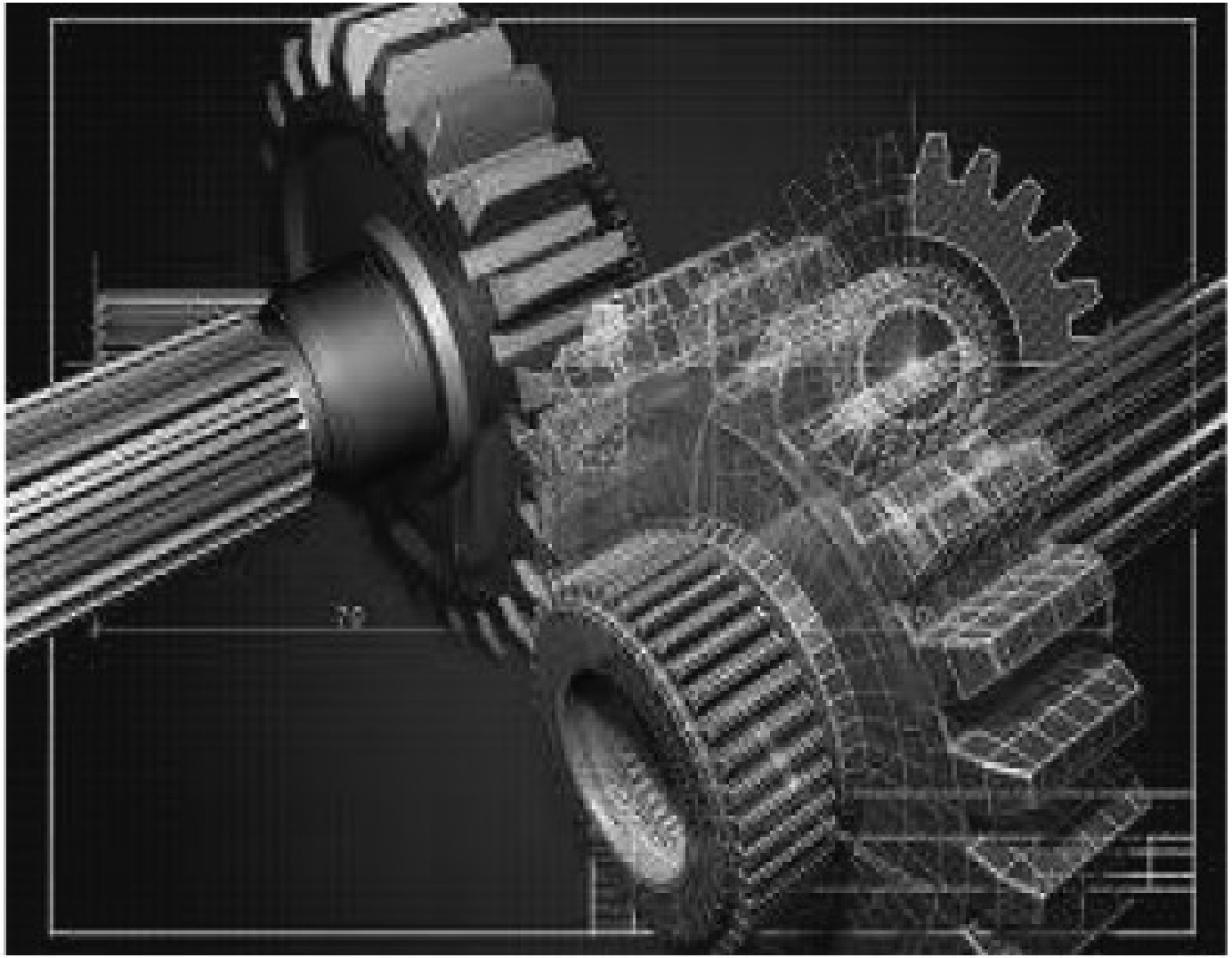
Sheryl G Colaco[1], Ciji P Kurian[2], V I George[3], Anitha M Colaco[4]

[1]Electrical Engineering and Electronics Engineering, St. Joseph Engineering College, Mangaluru
[2]Electrical & Electronics Engineering, Manipal Institute of Technology, Manipal
[3]Instrumentation and Control Engineering, Manipal Institute of Technology, Manipal
[4]Electrical & Electronics Engineering, NMAMIT, Nitte

ABSTRACT

In recent years, fluorescent lamp dimming controls are an integral part of daylight artificial light integrated schemes intended for realization of energy savings. However, dimming, like any lighting option, presents its own particular challenges and poten tial tradeoffs. In v iew of this, the present manuscript depicts the preliminary work progress carried out to arrive at a comprehensive idea on dimming implications on key factors: electrical characteristics, photometric distributions of lighting systems and influence on quality as well as quantity of visual environment. The objective is to experimentally establish the acceptable range of dimming control voltage that would satisfy both electrical and photometric performance of luminaire. The vital part of the paper is devoted towards presentation of measurement results. For the experimental analysis, three representative samples of different commercial analog 1-10VDC electronic dimmable ballasts and fluorescent fixtures are compared and evaluated over their control voltage dimming range.

**Full paper: Energy and Power Engineering, doi:10.4236/epe.2010.21009, Vol. 2, Issue No. 1, 2010, pp. 53-64*



MECHANICAL ENGINEERING

Spiritual Dimensions in Management

Shreeranga Bhat[1], Rodrigues L L L[2]

[1]Department of Mechanical Engineering, St. Joseph Engineering College, Mangaluru
[2]Department of Mechanical Engineering, Manipal Institute of Technology, Manipal

ABSTRACT

"Old is gold", according to this idiomatic sentence, this paper describes how the olden theories of life-management are still complementary to the modern theories of business management. The paper mainly deals with the traditional views of management, necessityof management, managerial qualities & some comparisons about powers, personalities, personality developments, personality tests, and communication in organization from olden& modern management's point of view. The paper shows how Chanakya's policies, Sanskrit subhashita's and the wisdom of Bhagavad-Gita provide the foundation to the modern day management style and philosophy

**Full paper: National Conference on Modern Trends in Management (MTM), Organised by Department of Industrial and Production Engineering, 12-13th May 2004, Gogte Institute of Technology, Belgaum*

Investigation on Spray Processing of Al-Si Alloys and Their Wear Characteristics

K Raju[1], A P Harsha[2], S N Ojha[3]

[1&2]Department of Mechanical Engineering, IT - BHU, Varanasi
[3]Department of Metallurgical Engineering, IT-BHU, Varanasi

ABSTRACT

Spray forming has been employed for the production of Al-12%Si, Al-15%Si and Al-20%Si alloys. The process involved atomization of the melt at a pressure of 1MPa and a temperature of 850°C. The spray was deposited over a copper substrate to produce large size preforms. The microstructural and wear characteristics of these alloys have been evaluated and compared with that of chill cast alloys. The microstructure of spray formed alloys exhibited ultra fine Si particles with globular shape in the matrix having equiaxed grain morphology. In contrast the needle like and plate like Si particles were observed in the matrix of chill cast alloys. The wear rate of spray formed alloys was invariably observed to be lower than that of chill cast alloys over a wide range of loads. The reason for microstructural modification and resultant improvement in wear characteristics of the alloys is discussed.

**Full paper: Proceedings of the International Symposium for Research Scholars (ISRS) on Metallurgy, Materials Science and Engineering, 10th-12th December, 2008, IIT Madras, Chennai, Tamil Nadu, India, pp. 657-662*

Spray Forming of Aluminum Alloys and Its Composites: An Overview

K Raju[1], S N Ojha[2], A P Harsha[3]

[1&3]Department of Mechanical Engineering, IT-BHU, Varanasi
[2]Department of Metallurgical Engineering, IT-BHU, Varanasi

ABSTRACT

In this article, the work that has been carried out in the area of spray forming of aluminum alloys and its composites has been summarized. The developments that had taken place in the past two decades in this area have been presented. Most of the researchers have investigated on the microstructural properties of these alloys and their composites. In this article, main emphasis was given to the microstructures, wear characteristics, and mechanical properties of as-cast and as-sprayed aluminum alloys. Also, this article is designed to provide the microstructures of ascast and as-sprayed aluminum-15% silicon alloy. The microstructure of as-sprayed alloy has invariably indicated equiaxed grains throughout the deposit and has been observed that the Si particles are uniformly distributed in the Al matrix. Spray forming offers a combination of low cost manufacturing with enhanced properties and performance. As such it has emerged as a key competitor for existing technologies such as conventional casting, ingot metallurgy, and powder metallurgy.

Full paper: Journal of Materials Science, Vol. 43, Issue No. 8, 2008, pp. 2509-2521

Lean Six Sigma: New System to Obtain Strategic Strength & Competitive Advantage and Profits for Hospitals

Shreeranga Bhat[1], N A Jnanesh [2], Nagaprasad H[3]

[1]Department of Mechanical Engineering, St. Joseph Engineering College, Mangaluru
[2]Department of Mechanical Engineering, K V G College of Engineering, Sullia
[3]Department of Mechanical Engineering, Malnad College of Engineering, Hassan

ABSTRACT

The challenges of healthcare today are astronomical – from a patient safety, accessibility, profit and medical quality points of view. Basically, there are four different approaches that can be used to improve hospitals quality: Put more money into the healthcare system; reorganize healthcare; strengthen management; or use quality methods designed specifically for continuous improvement. The focus of this paper is on the use of a quality method i.e. Lean Six Sigma to improve hospitals. This paper emphasis on the challenges faced by the hospitals, including all forms of muda (a Japanese term for waste). Also some major projects that can be carried out in a hospital based on Lean Six Sigma are discussed .

Full paper: National Conference on New Advances in Thermal, Design, Materials and Manufacturing Engineering(NATDMME), Organized by Department Of Mechanical Engineering, 5th-7th March 2009, Malnad College of Engineering, Hassan

Influence of Injection Timing on the Performance and Emission Characteristics of a CI Engine Fuelled with B20 Blend of Waste Cooking Oil Biodiesel with Dimethyl Carbonate as Fuel Additive

Rolvin Sunil D'Silva[1], Mohanan P[2]

[1]Department of Mechanical Engineering, St. Joseph Engineering College, Mangaluru
[2]Department of Mechanical Engineering, National Institute of Technology Karnataka, Surathkal

ABSTRACT

The objective of current research work was to investigate the usage of fuel additive DiMethyl Carbonate in B20 blend of waste cooking oil (WCO) biodiesel and varying the injection timings (24°, 27° and 30° btdc) in order to reduce the emissions of all regulated pollutants from the diesel engine.

In the present work biodiesel was prepared using esterification process from waste cooking oil collected from the restaurants and catering services. The fuel additive which was chosen for study, DiMethyl Carbonate (DMC) is in a liquid state under atmospheric temperature and pressure, colorless, non-toxic and non-corrosive. DMC contains 53% by weight of oxygen. The high oxygen content helps to reduce smoke and particulate matter in the engine exhaust. This additive was added to B20 blend biodiesel in proportions of 5%, 10%, 15% and 20%. Properties like density, viscosity, specific gravity and calorific value were found out experimentally for each fuel blend. A single cylinder, water-cooled, direct injection diesel engine was used for experiments. The engine and dynamometer are interfaced with a computer. HC, NOx, CO, CO2 are measured using an exhaust gas analyzer and opacity of exhaust gas was measured using smoke-meter. Various engine performance parameters such as thermal efficiency and brake specific energy consumption (BSEC) were calculated from the acquired data. Experiments were done for the normal, advanced and retarded injection timing. A decrease in the exhaust emissions and smoke opacity is observed because of the use of fuel additives and a significant reduction in the NOx emission is also found as the injection timing is retarded

**Full paper: National Conference on I.C Engines and Combustion (NCICEC), 10th-12th December 2009, Rapuji Institute of Engineering & Technology, Davangere*

Effect of Diethyl Ether in B20 Waste Cooking Oil Methyl Ester on the Emission Characteristics of a C.I Engine

Rolvin D'Silva[1], P Mohanan[2]

[1]St. Joseph Engineering College, Mangaluru
[2]National Institute of Technology Karnataka, Surathkal

ABSTRACT

Biodiesel is an alternative to petroleum-based fuels, derived from vegetable oils, animal fats and used waste cooking oil. In the present work biodiesel was derived from waste cooking oil and a fuel additive Diethyl ether was used, also known as ether and ethoxyethane. It is a clear, colourless, and highly flammable liquid with a low boiling point and a characteristic smell. It has a high volatility and low auto ignition temperature. This additive was added to B20 blend biodiesel derived from waste cooking oil (WCO) in proportions of 5%, 10% and 15% of volume. A study was carried out to investigate the emission characteristics of single cylinder, four stroke kirloskar diesel engine using the various fuel samples for three different Injection timings 24°, 27°, 30° btdc. It was found that unburnt hydrocarbons (UBHC) and smoke opacity values decreased as the percentage of DEE in fuel increased whereas there was a slight increase in NOx values. As the injection angle was retarded from the advanced angle (30° btdc) the UBHC, smoke opacity increased by around 10% whereas the NOx value decreased significantly.

Full paper: International Conference on Frontiers in Mechanical Engineering, (FIME), 20th-22nd May 2010, NITK, Suratkal

Effect of Processing Routes on the Corrosion Behavior of Al-Si Alloys

K Raju[1], A P Harsha[2], S N Ojha[3]

[1&2]Department of Mechanical Engineering, IT–BHU, Varanasi
[3]Department of Metallurgical Engineering, IT–BHU, Varanasi

ABSTRACT

In the present investigation, the corrosion behavior of Al–12Si, Al-15Si and Al-20Si alloys processed by spray casting, vertical centrifugal casting and chill casting techniques has been investigated. Potentiodynamic polarization tests were conducted on all the Al-Si alloys using a calorimetric corrosion cell in an aqueous 0.1N NaCl solution at room temperature. The corrosion rates of spray cast alloys are observed to be invariably lower than that of centrifugal cast and chill cast alloys. The corrosion rates of chill cast alloys are the highest among the others. As the Si content increased, the corrosion resistance increased in all the alloys irrespective of the processing route. The improved corrosion resistance of spray cast Al-Si alloys is discussed in the light of their microstructural modifications leading to ultra fine and uniformly distributed Si particles in the Al matrix compared to the coarse and segregated microstructures of the alloys produced by centrifugal and chill casting techniques.

**Full paper: Proceedings of the International Conference on Advanced Materials, Manufacturing, Management and Thermal Sciences, 18th-19th November 2010, SIT, Tumkur, Karnataka, India, pp 36*

Effect of Processing Techniques on Microstructure, Wear and Mechanical Properties of Al-15Si Alloy

K Raju[1], A P Harsha[2], S N Ojha[3]

[1&2]Department of Mechanical Engineering, IT-BHU, Varanasi
[3]Department of Metallurgical Engineering, IT-BHU, Varanasi

ABSTRACT

Hyper-eutectic Al-Si alloys are the candidate materials for automotive and aerospace industries due to their low coefficient of thermal expansion, high wear resistance and good mechanical properties. The properties of Al-Si alloys were affected by primary Si phase. Therefore, behavior of primary Si during solidification should be controlled to achieve desired properties. It was reported in the literature that the primary Si was dominantly affected by cooling rate during solidification. The higher the cooling rate, finer will be the microstructure. In this study, the effect of spray casting, centrifugal casting and chill casting processes on microstructure, wear and mechanical properties of hyper-eutectic Al-15Si alloy has been investigated. In spray casting process, the gas melt interaction occurs at the tip of a flow tube concentric to the gas flow channel (convergent-divergent type spray nozzle) to promote atomization of the melt. The resultant spray of droplets is deposited on a copper substrate. The melt temperature is maintained at 850ºC, the gas pressure at 1MPa and the nozzle to substrate distance is 0.35 m. The spray cast alloy has been subjected to hot isostatic pressing for its porosity reduction. Hot isostatic pressing has reduced the porosity in the alloy from 19 to 8%. In another set of experiments, a centrifugal casting was produced by pouring the molten metal at 800ºC in to a mould rotating at 1000 rpm and a chill casting was produced by pouring molten metal at 700ºC in to a cast iron mould. Samples for microstructural examination were polished through standard metallographic techniques and examined under a ZEISS Optical Microscope. Wear tests were carried out for all the alloys on a DUCOM Pin on Disc machine at a load of 20 N for different sliding velocities. Vickers hardness tests were conducted at a load of 10 N for all the alloys. The microstructure of spray cast alloy showed considerable refinement and modification in the morphology of eutectic and primary Si and it consists of finely divided and uniformly distributed second phase Si particulate in the Al matrix. The sizes of eutectic and primary Si range from 2–10µm. On the contrary, the microstructures of centrifugal cast and chill cast alloys consist of coarse eutectic Si needles and primary Si polyhedra in the Al matrix. The eutectic and primary Si sizes range from 10–50 µm and 10–25 µm in centrifugal cast alloy and 20–100 µm and 20–70µm in chill cast alloy respectively. The wear rate is lowest for the spray cast alloy and highest for chill cast alloy. This behavior is in consistent with several investigators observations on Al-Si alloys that smaller the Si particle size, the lower would be the wear rate. The results of hardness testing showed that the hardness is highest for spray cast alloy and lowest for chill cast alloy. This is due to the microstructural refinement in the former owing to the rapid solidification effect. Finer microstructure in the spray cast alloy led to better wear and mechanical properties.

**Full Paper: Proceedings of the 48th National Metallurgists Day, 64th Annual Technical Meeting, 14th-16th November 2010, IISC, Bengaluru, Karnataka, India, pp 69*

Evolution of Microstructure and its Effect on Wear and Mechanical Properties of Spray Cast Al–12Si Alloy

K Raju[1], A P Harsha[2], S N Ojha[3]

[1&2]Department of Mechanical Engineering, IT-BHU, Varanasi
[3]Department of Metallurgical Engineering, IT-BHU, Varanasi

ABSTRACT

In the present study, the microstructural features, mechanical properties and wear characteristics of spray cast Al–12Si alloy have been investigated and compared with that of the chill cast alloy. The spray cast alloy was subjected to hot isostatic pressing for reducing the porosity of the deposit from 26% to 6%. The microstructure of the spray cast and hot isostatically pressed alloy consisted of finely divided globular shaped eutectic Si uniformly distributed in the Al matrix. The fine particles of Si were invariably observed in the bottom and top regions of the spray-deposit in contrast to relatively large size Si particles in the central region. The microstructure of the chill cast alloy was coarse and consisted of an eutectic mixture of α-Al and Si needles. The room temperature tensile tests and hardness measurements showed improved mechanical properties of spray cast alloy over that of the chill cast alloy. In addition, the dry sliding wear test indicated a superior wear resistance of the spray cast alloy over a wide range of sliding velocity. This behavior of the spray cast alloy is discussed in the light of its microstructural modification induced by spray casting.

*Full paper: *Materials Science & Engineering A, Vol. 528, 2011, pp 7723-7728*

Microstructural Features, Wear and Corrosion Behavior of Spray Cast Al-Si Alloys

K Raju[1], A P Harsha[2], S N Ojha[3]

[1&2]Department of Mechanical Engineering, IT-BHU, Varanasi
[3]Department of Metallurgical Engineering, IT-BHU, Varanasi

ABSTRACT

In the present study, the microstructural features, wear characteristics, and corrosion behavior of spray cast Al–12Si, Al–15Si, and Al–20Si alloys have been investigated. The alloys were spray cast and hot isostatically pressed. Hot isostatic pressing has considerably reduced the porosity in spray cast alloys. The microstructure of spray cast alloys showed fine and globular shaped Si particles in the Al matrix in contrast to needle-type eutectic Si and blocky-type primary Si in the Al matrix in chill cast alloys. The dry sliding wear tests showed that the wear rates of spray cast alloys are invariably lower and the potentiodynamic polarization tests showed that the corrosion resistance of spray cast alloys is considerably higher than that of chill cast alloys. The high wear and corrosion resistance of spray cast alloys have been discussed in the light of the microstructural modification induced during the spray casting process.

**Full paper: Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology, Vol. 225, 2011, pp. 151-160*

Effect of Processing Techniques on the Mechanical and Wear Properties of Al-20Si Alloy

K Raju[1], A P Harsha[2], S N Ojha[3]

[1&2] Department of Mechanical Engineering, IT-BHU, Varanasi
[3]Department of Metallurgical Engineering, IT-BHU, Varanasi

ABSTRACT

In the present investigation, the mechanical and wear properties of Al–20Si alloy processed by spray casting and vertical centrifugal casting processes have been evaluated and compared. In spray casting process the melt was gas atomized and the spray-deposited over a copper substrate. The spray-deposit exhibited considerable porosity and subjected to hot isostatic pressing to reduce the porosity from 19 to 2%. The centrifugal casting process provided cylindrical shaped preform with characteristically low porosity. The microstructure of spray cast alloy showed ultra fine and uniformly distributed primary and eutectic Si particles in the Al matrix. In contrast, a coarse polyhedral shaped morphology of the primary Si phase was observed in the microstructure of the centrifugal cast alloy. The wear rate of spray cast alloy was invariably lower than that of centrifugal cast alloy. The room temperature tensile and hardness tests of spray cast alloy showed considerable improvement in its strength, ductility and hardness over that of centrifugal cast alloy. The improvement in wear properties of spray cast alloy is discussed in the light of its microstructural modification induced by spray casting and nature of debris particles generated during wear testing.

**Full paper: Transactions of IIM, Vol. 64, Issue No. 1&2, 2011, pp. 1- 5*

Stability Characteristics of Journal Bearing Systems Lubricated with Couple Stress Fluids using the Non-linear Transient Approach

Binu K G[1], Shenoy B S[3], Rao D S[3], Pai R[4]

[1]Research Scholar, Dept. of Mechanical and Manufacturing Engineering, Manipal Institute of Technology, Manipal
[2]Department of Aeronautical and Automobile Engineering, Manipal Institute of Technology, Manipal
[3&4]Department of Mechanical and Manufacturing Engineering, Manipal Institute of Technology, Manipal

ABSTRACT

A theoretical study of the whirl instability of a rigid rotor supported on a journal bearing lubricated with couple stress fluids is presented. The Reynolds equation is modified and used to obtain the whirl orbits of the journal center within the clearance circle using a non linear transient approach. The whirl orbits are obtained for various eccentricity ratios and additive characteristic lengths. The critical mass parameter and threshold speeds are evaluated to obtain the threshold stability maps. The stability maps offer useful insights into the dynamic characteristics of journal bearing systems operating on couple stress fluids and form a useful tool in the design of journal bearing systems. The results reveal that stability improves for journal bearings operating with couple stress fluids as compared to Newtonian fluids. The results of the study are compared with those obtained by linear perturbation method and they indicate a significant difference in the variation of critical whirl ratios.

*Full paper: *Journal of Tribology and Surface Engineering, Vol.3, Issue No. 1-2, 2011, pp.51-66*

Altered Tooth-Sum Gearing for High Contact Ratio

Sachidananda H K[1], Joseph Gonsalvis[2]

[1]Department of Mechanical Engineering, Manipal University, Dubai Campus Dubai
[2] St. Joseph Engineering College, Vamanjoor, Mangaluru

ABSTRACT

In gearing smoothness in transmission of power depends mainly on the contact ratio. Contact ratio determines the load shared by the teeth in mesh and it will be lower when the contact ratio is higher. Therefore in high contact ratio gearing the load transfer from one tooth mesh to another takes place at a lower magnitude of load and the noise produced by this kind of a gearing will be lower. Profile modification in involute tooth gearing helps build properties to the gears in mesh that are uncommon to standard gears and further, it also helps in altering the tooth-sum of a gear pair operating between a specified centre distance and module. It is well known that highest contact ratio is obtained using standard gears is 1.94 (when a pinion meshes with a rack). Using altered tooth-sum gearing it is possible to achieve contact ratios higher than two. Thus high contact ratio gearing helps bring down the contact stresses and improve durability of gears. This paper presents the methods of using altered tooth-sum gearing to obtain high contact ratio and also discusses about its benefits.

**Full paper: International Journal of Engineering Research and Applications, ISSN: 2248-9622, Vol. 1, Issue No. 3, September-October 2011, pp. 1234-1241*

High Profile Shift Gearing Using Altered Tooth-Sum Gearing

Sachidananda H K[1], Joseph Gonsalvis[2], Prakash H R[3]

[1]Department of Engineering, Manipal University
[2]St. Joseph Engineering College, Vamanjoor, Mangaluru
[3] B M S College of Engineering, Bangalore

ABSTRACT

The modern trend in gear technology envisages the use of profile corrected gears in most of the power transmission applications. Flexibility in modifying the involute profile has helped improve the performance of gearing. Using profile shift gearing it is possible to alter the tooth-sum of a gear pair working between a specified center distance and module. The profile shift resulting from altering the tooth-sum can be distributed between the gears of the pair to meet the design requirements. This paper discusses the effect of high profile shift gearing on operating pressure angle, length of path of contact and contact ratio, location of the pitch point, sliding and contact relations and contact stress. It is found that high profile shift gearing using the method of altering the tooth-sum offers greater flexibility to the gear designers.

Full paper: International Journal of Advanced Engineering Sciences and Technologies, Vol. 11, Issue No. 1, 2011, pp. 1-7

MANAGEMENT & BUSINESS ADMINISTRATION

Quality Training: Principle Driver of Attitude

Anjali Ganesh[1]

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

ABSTRACT

Training programmes are expensive and the returns on investments should override the costs. Commercial banks are training their workforce with varieties of programmes and methods with the aim of improving their skills, knowledge and attitude. No doubt, training helps in enhancing the skill and knowledge base of the employees, but its role in changing the attitude of the employees towards their work and also towards training is a questionable issue. Commercial banks need to concentrate more on enhancing intrinsic as well as extrinsic quality of training with a view to bringing forth insubstantial changes in the attitude of the employees.

**Full paper: Global Management Review, ISSN: 0973-9947, Vol. 1, Issue No. 3, 2007, pp. 64-75*

A Study with Respect to Training Programmes in Banks: An Opinion Survey

Anjali Ganesh[1]

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

ABSTRACT

Training in banks is considered one of the vital organisational development activities, which aims at developing operational skills, competence and attitudinal changes amongst their employees, to render effective service to the clientele, through the development of human resources. When the training needs at individual, organisational and job level are identified, training priorities have to be set by designing appropriate programmes for the various categories of employers to be trained in banks. Training programmes have to be relevant to the operational realities and needs of the user systems in the organization. The employees in their back home situation should be supported to put into practice the new knowledge imbibed through various learning processes. In nutshell, a well thought out training strategy should cover up the directions and guidelines of training, by prioritizing the training programmes with specific objectives for each programme with the backup of the management of the bank.

**Full paper: ACRM- Journal of Business & Management Research, ISSN: 0973-3523, Vol.2, Issue 2, September 2007, pp. 35-46*

Mergers and Acquisitions: Human and Cultural issues

Prakash Pinto[1], Balakrishna C H[2]

[1]Business Department, Gulf College Muscat
[2]Department of PG Studies and Research in Commerce, Mangalore University

ABSTRACT

The last two decades have witnessed extensive mergers and acquisitions as a strategic means for achieving sustainable competitive advantage in the corporate world. Estimates suggest that at least half of all mergers failed to achieve the expected financial and operating synergies. As a matter of fact, mergers and acquisitions are seen through the financial sense neglecting the human and cultural aspects arising from such integration. Merger is not just putting two organizations together; it is putting people and their cultures together. Against this backdrop, the paper highlights the trends in mergers and acquisitions, the relevance of human and cultural issues in premerger planning and postmerger integration, and the strategies for successful human and cultural integration in mergers and acquisitions.

**Full paper: SCMS Journal of Indian Management, Vol. 3, Issue No.4, October- December 2007, pp. 29-34*

Motivating Women to be Self Reliant Through Entrepreneurship: A Case Study with Reference to RUDSET Institute

Anjali Ganesh[1]

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

ABSTRACT

The task of converting enthusiastic women in to entrepreneurs is not that easy. Even though, business offers best opening for women entrepreneurs, due to obstacles faced by self employment avenue, it is crucial to guide those women who want to become entrepreneurs. Imparting necessary skills, attitude and confidence to take up entrepreneurship amongst youth in general and women in particular through Entrepreneurship Development Programmes (the effectiveness of self-employment training or EDPs undergone by them. A humble initiative in mitigating unemployment by the Institute has led to employment generation by the settled trainees, which is highly evident. Perceptions of the women respondents point up that the EDPs have satisfied the trainees and instilled self-confidence in them. They have helped in broadening the mental horizons of EDPs) and self-employment training are the phenomenal service rendered by RUDSET Institute-Ujire (Karnataka State) to mitigate unemployment. This paper discusses the factors which motivate women entrepreneurs to take up their own business and the perception of women trainees regarding the participants by dropping interpersonal conflicts which is very much essential for building up healthy society.

*Full paper: *Bhavishya - Journal of Future Business School, Vol. 1, Issue No. 2, 2007, pp. 75-84*

Disaster Management – Role of HRD

Anjali Ganesh[1]

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

ABSTRACT

Disasters whether man made or environmental driven play mayhem with the lives of trillions of people around the globe every year. The repercussion of any disaster is suffering, devastation and casualty. Human susceptibility to disasters is an age old phenomenon. The vulnerability is reliant on exposure to risk; proper disaster management techniques can reduce the magnitude of vulnerability. Human resources will have to be trained and educated to handle the crisis situations by mitigating them. Human vulnerability to disasters should be handled by the weapon, human intervention. Scientific and skillful human intercession is possible only through Human Resource Development (HRD) in the desired direction. This paper analyses the problems in the administration and management of disaster and speaks about the roles of HRD in Disaster Management. It could be risk appraisal or public awareness and training, the noteworthy role of HRD can never be overruled.

**Full paper: HRM Review, ISSN: 0972-5148, Vol. 8, Issue No. 8, August 2008, pp. 63-65*

An Overview of Performance Appraisal and Employee Training and Development at Videocon Industries Limited, Mumbai

Anjali Ganesh[1]

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

ABSTRACT

Performance appraisal is a step where the management finds out how effective it has been at hiring and placing the employees. If any problems are identified, steps are taken to communicate with the employee and to remedy them. Performance appraisal and Employee training act as the basic mechanisms of Human Resource Development. Performance appraisal indicates the level of desired performance, level of actual performance and the gap between these two. This gap is bridged through different Human Resource Development techniques and training acts as an important employee development tool. Performance appraisal is not only used to create and maintain satisfactory level of performance but also helps superiors to have proper understanding about their subordinates which helps in strengthening the co-operative relation between the employees at various levels in the hierarchy. Performance appraisal system should act as a feedback to training and development programmes. This kind of supportive approach will not only enhance the image of the organization but also will keep up the satisfaction and motivation of the employees.

**Full paper: ACRM-Journal of Management Business and Research, ISSN: 0973-3523, Vol. 3, Issue No.2, September 2008, pp. 4-9*

Encapsulating Skill Development and Attitudinal Transformation in Bank Employees: Training Plays the Key

Anjali Ganesh[1]

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

ABSTRACT

One of the invigorating mechanisms of HRD to vitalize skills and engineer the positive attitudes amongst the employees of the commercial banks is 'Training and Development'. Commercial banks are preparing themselves on a war footing to face the environmental challenges globally. They are continuously imparting training programmes to enable their employees to handle assorted circumstances that arise on a day-to-day basis in the banks. Is the training effective in enhancing various banking skills of the employees? It is a reliable tool for attitudinal transformation of the employees? These are some of the debatable questions, which this paper tries to answer.

**Full paper: Bhavishya-Journal of Future Business School, ISSN: 0973-8274, Vol.2, Issue No.2, October 2008, pp. 87-101*

Communication Skill: A Powerful Defence Mechanism

Anjali Ganesh[1]

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

ABSTRACT

Business in the arena of Finance is getting tougher day by day with the private as well as public players ferociously trying to capture the market. Rising educational standard and awareness amongst the customers have made them more discerning in their tastes and needs. Employees need to serve the customers palatably for which communication skill acts as an appetising sauce. Commercial banks are equipping their workforce with Training and Development in order to harness the skills of the employees. Skills are the real resistance mechanisms for the bank employees and communication skill stands as the most powerful defence mechanism which enables to fight most of the diseases like customer unhappiness, employee dissatisfaction, poor customer service and faculty marketing. How far the training in banks has managed to upgrade the skills of the employees is a questionable topic.

Full paper: FOCUS-The International Journal of Management, ISSN: 0973-9165, Vol. 4, Issue No.2, October 2008, pp. 25-34

Training Approach - A Study with Reference to New Generation Bank: ICICI Bank Ltd.

Anjali Ganesh[1]

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

ABSTRACT

One of the India's biggest development financial institution and a tremendously growing New Generation Private Sector Bank, ICICI Bank Ltd., is a new breed of Indian banks: ambitious, globally competitive, and finely tuned to customer needs and internet savvy. Training Needs of ICICI Bank Ltd. is very high as it rides on technology. Training is imparted with the perspective of encouraging learning and helping the employees to handle the products of the bank efficiently by imbibing the skills of the prudent banker. Empowerment of the trainees to apply the training inputs into practice works wonders to transform the organisation from stereotypic culture to non-stereotypic one.

**Full paper: International Journal of Rural Development and Management Studies. ISSN: 0975-0614, Vol.2, Issue No.2, December 2008, pp. 171-177*

Internal vs. External Training - An Empirical Study

Anjali Ganesh[1]

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

ABSTRACT

Trainees are the best judges to evaluate the quality of training, teaching methods, trainer's effectiveness, infrastructure of training and the role of training in enriching the knowledge. An evaluation of training is highly essential to know whether training is of help to the employees and to what extent. Commercial banks, with a view to bringing forth skill, knowledge and attitudinal transformation amongst their employees are training them continuously either through in-house or external training programmes. It is interesting to know which type of training is more effective, whether 'in-house' or 'external' in enriching the knowledge of the employees in banks.

**Full paper: AIM Explore- Journal of Management Awareness, ISSN: 0973-0001, Vol. 5, Issue No.1&2, January-December 2008, pp 50-57*

Skill Sculpting: An Indispensable Mantra

Anjali Ganesh[1]

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

ABSTRACT

Financial Market is becoming more competitive with private and foreign bankers emerging in the scene. The customers are becoming more distinct and choosy about the banks and their services as they have wide choice. Under the circumstances, the employees need to develop certain basic essential skills so as to be the winners in marketing and customer service. Training and Development is one of the significant HRD weapons the commercial banks are equipping their workforce with. Training system might lose its credibility if it does not result in enhancing the skills of the employees. Skill sculpting and development is one of the pre-emptive benchmarks of the organization and the employees and makes an indispensable mantra of success.

**Full paper: Prajnan- ISSN-0970-8448, Vol. 37, No.2, 2008-2009, pp 137-159*

Travails of Trainers: Some Empirical Evidences

Anjali Ganesh[1]

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

ABSTRACT

Trainer is the captain of the training mission on whom the effectiveness of the training system depends. He is the one, who stimulates the process of learning, growth and development of the trainees. It is most pathetic that the status of the trainers in the commercial banks is looked down upon as a derogatory one. The trainer, whose role becomes all the more important in the context of the overall training system of the banks can never, be overruled.

**Full paper: Indian Journal of Development Research and Social Action, ISSN: 0973-3116, Vol. 5, Issue No.1&2, January-December 2009, pp 215-220*

Psychological Contract: Theoretical Dimensions, Literature Review and Research Agenda

Prakash Pinto[1], Rekha Hitha Aranha[2]

[1&2] Department of Business Administration, St. Joseph Engineering College, Mangaluru

ABSTRACT

The term 'Psychological contract' has been in the academic discussion since 1960s. As distinguished from a formal written contract of employment which only identifies mutual duties and responsibilities in a general form, a psychological contract represents the mutual beliefs, perceptions and informal obligations between an employer and an employee. It gives a practical approach to the contract of employment. Basically, the psychological contract gives the sum of beliefs held by an individual and his/her employer about their mutual expectations. A psychological contract creates emotions and attitudes in the employment relationship and hence to manage the employment relationship effectively it is necessary to understand the psychological contract with its various dimensions. The employment rights, duties and obligations emerge from the interpersonal relationships formed in the workplace and the way in which the managers, employees and supervisors behave on a day to day basis cannot be determined in a formal contract of employment. In fact, employees would negotiate to fulfil their side of desires and such negotiation more often takes the form of behavioural action and reaction. Therefore, a psychological contract determines what the parties to the contract of employment will or will not do and how they do it. However due to the unarticulated nature of the psychological contract, the fundamental problem is that the employees are not clear what they expect from their employers and some employers are not clear what they expect from their employees. It should be noted that the psychological contract governs the continuing development of the employment relationship but its impact may not be fully understood by the parties to the employment contract.

Against this backdrop, the present paper highlights the various theoretical dimensions of a psychological contract and its relevance in human resource management.

**Full paper: Prabandhan: Indian Journal of Management, Vol. 2, Issue No. 5, September-October 2009, pp 29-34*

Credit Risk Model for Agricultural Loan Portfolio- A Study with Reference to Karnataka Bank

Babitha Rohit[1], Varsha Rao[2]

[1]Department of Business Administration, St. Joseph Engineering College, Mangaluru
[2]Deloitte Haskins and Sells, Bengaluru

ABSTRACT

A rapid growth in the rural economy and within that of agriculture in India is highly feasible, provided key ingredients such as adequate supply of credit and the availability of the tools for the management of risks that agriculture is exposed to, are religiously followed. The paper develops a credit risk model for agricultural loan portfolio of Karnataka Bank ltd. It also suggests how such a model would help the bank to reduce risk in agricultural lending. The logistic model developed in this study captures the major risk drivers in agricultural portfolio, some of these risk factors being land area, networth, security, probability of default and so on. The study will help the bank to diversify risk and fortify its relationship with the borrowers.

**Full paper: St. Aloysius College- AIMIT, Working Paper Series, Vol. 1, Issue No. 2, March 2011, pp 37- 44*

Leveraging the Power of Differences: Workforce Diversity

Ajaya[1], Prakash Pinto[2]

[1]MSNM Besant Institute of PG (MBA) Studies, Bondel, Mangaluru
[2]Department of Business Administration, St. Joseph Engineering College, Mangaluru

ABSTRACT

It is a fact that the increasing global economic integration coupled with liberalisation has spelled myriad challenges and opportunities for business corporations. This has enticed many forward looking organisations to spread their wings across the globe and ushering a revolution in work place practices. The initiative was indeed viewed as both business necessity and opportunity. Organisations world wide began to beckon talented human resources regardless of their country and background. The need for making organizations culturally sensitive and internationally focused to seize the global opportunities was increasingly realized. This paper examines the various dimensions of diversity initiatives with the global perspective.

**Full paper: SCMS Journal of Indian Management, Vol.8, Issue No.2, April- June 2011, pp 27-39*

MASTER OF COMPUTER APPLICATIONS

Content and Structure Based Classification of XML Documents

Shashirekha H L[1], Vanishree K S[2], Sumangala N[3]

[1]Department of Computer Science, Mangaluru University, Mangaluru
[2]Department of Computer Science, Govt. First Grade College, Sikaripura
[3]Department of MCA, St. Joseph Engineering College, Mangaluru

ABSTRACT

The ever increasing amount of XML documents available on the World Wide Web demands automated tools and techniques that would make the search and retrieval of XML documents more effective and efficient. Classification of XML documents is one of the significant tasks which are being explored by many researchers in this direction. Due to the presence of inherent structure in the XML documents, conventional text classification methods cannot be used to classify XML documents directly. Hence, there is a need for the development of tools and techniques that automatically classifies XML documents. In this work, we have developed an algorithm based on 'k' Nearest neighbors to classify XML documents by considering both the content and structure. The developed algorithm is tested on a subset of MEDLINE dataset for different values of 'k' and varying size of training set and the results are tabulated.

**Full paper: International Journal of Machine Intelligence, ISSN: 0975–2927, E-ISSN: 0975–9166, Available online at http://www.bioinfo.in/contents.php?id=31, Vol. 3, Issue No. 4, 2011, pp 376-380*

Using SVMs for Filtering Translation Tables for Parallel Corpora Alignment

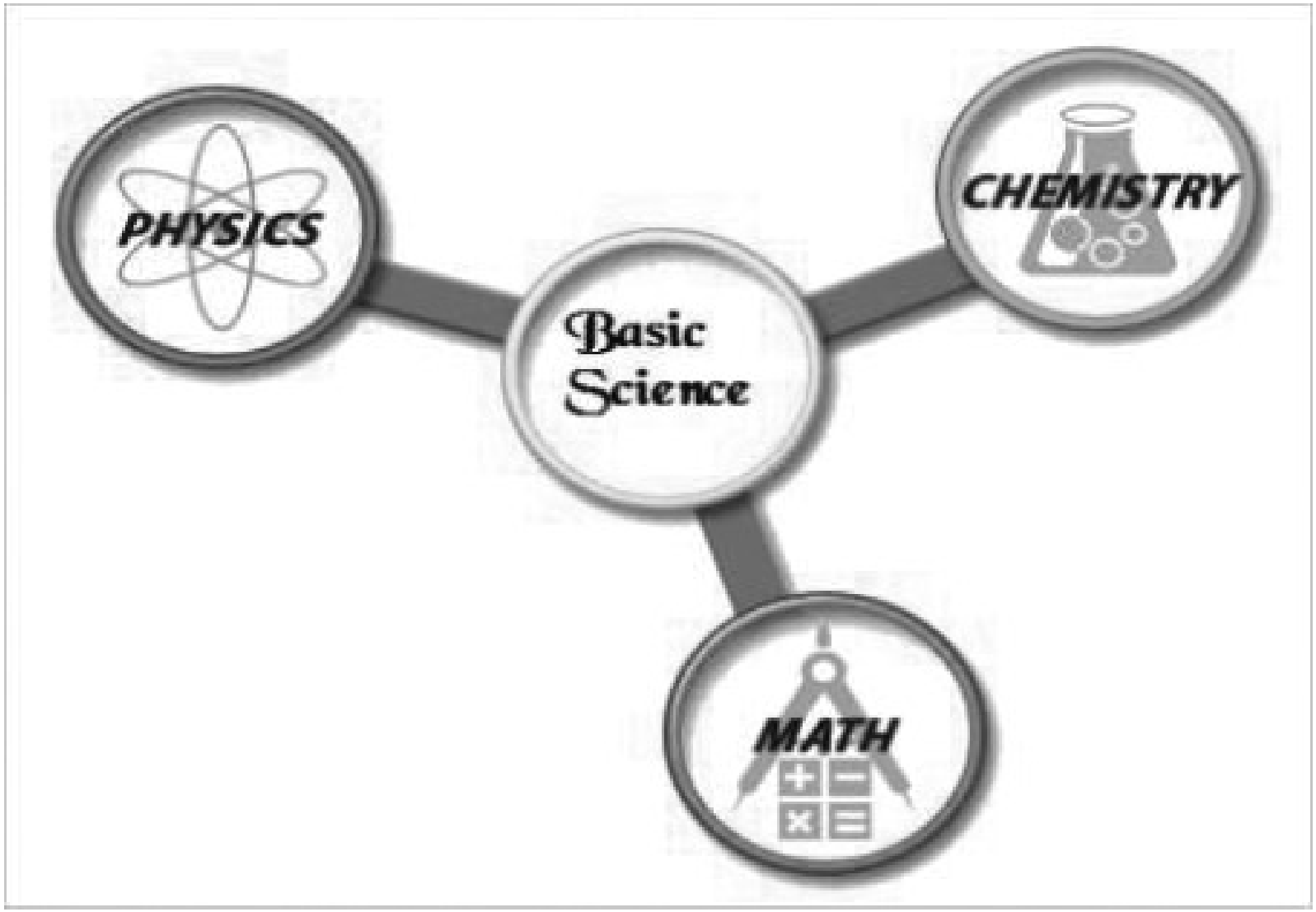
K M Kavitha[1], Luís Gomes[2], Gabriel Pereira[3], Lopes [4]

[1,2,3&4] Faculdade de Ciências e Tecnologia Universidade Nova de Lisboa , Quinta da Torre, Caparica, Portugal

ABSTRACT

Translation Lexicons are known to improve the quality of parallel corpora alignment at sub-sentence granularity, the quality of newly extracted translations, and as a consequence, Machine Translation and cross language information retrieval. Bilingual pairs (entries) that are part of such translation lexicons should be correct if they are to contribute positively to the improvement of application's quality. This paper proposes and focuses on a method for classifying bilingual entries that were automatically extracted from aligned parallel corpora as correct or incorrect, by using a Support Vector Machine based classifier. Experimental results demonstrate that the classification approach enabled a Micro f-measure higher than 85% for language pair English-Portuguese.

*Full paper: *Proceedings of the 15th Portuguese Conference in Artificial Intelligence, EPIA, October 2011, Lisboa, Portugal, pp 690-702*


PHYSICS
Basic Science
CHEMISTRY
MATH

Infrared and NMR Spectra of Arylsulphonamides,4-X-$C_6H_4SO_2NH_2$ and i-X,j-Y $C_6H_3SO_2NH_2$ (X = H; CH_3; C_2H_5; F; Cl; Br; I or NO_2 and i-X,j-Y = 2,3-$(CH_3)_2$; 2,4-$(CH_3)_2$;2,5-$(CH_3)_2$; 2-CH_3, 4-Cl; 2-CH_3, 5-Cl;3-CH_3, 4-Cl; 2,4-Cl_2 or 3,4-Cl_2)

B T Gowda[1], K Jyothi[2], J D D'Souza[3]

[1,2&3] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

Several arylsulphonamides of the configuration, 4-X-$C_6H_4SO_2NH_2$ (where X=H; CH_3; C_2H_5; F; Cl; Br; I or NO_2) and i-X, j-Y $C_6H_3SO_2NH_2$ (where i-X, j-Y =2,3 –($CH_3)_2$; 2,4 –($CH_3)_2$; 2,5 –($CH_3)_2$; 2- CH_3, 4-Cl; 2-CH_3, 5-Cl; 3-CH_3, 4-Cl; 2,4-Cl_2 or 3,4-Cl_2) were prepared, and their infrared spectra were measured in the solid state. The NMR spectra were recorded in solution. N-H asymmetric and symmetric stretching vibrations absorb in the ranges, 3390-3323cm^{-1} and 3279-3229 cm^{-1}, respectively. Asymmetric and symmetric stretching SO_2 stretching vibrations, appear as strong absorption lines in the ranges, 1344-1317cm^{-1} and 1187-1147 cm^{-1}, respectively. Sulphonamides exhibit S-N stretching vibrational absorptions in the range, 924-906 cm^{-1}. The effect of substitution in the phenyl ring in terms of electron withdrawing and electron donating groups could not be generalized, as the effect is non-systematic. The chemical shift is highly dependent on the electron density around nucleus or associated with the atom to which it is bonded. Hence empirical correlations relating the chemical shifts to the structures have been discussed. The chemical shifts of aromatic protons and carbons in all the arylsulphonamides have been calculated by adding substituent contributions to the shift of benzene, the principle of substituent addition. Considering the approximation made, the agreement between the calculated and experimental chemical shift values reasonably good. Generally, electron withdrawing groups show high chemical shifts compared to electron- donating groups.

*Full paper: Zeitschrift fur Naturforschung (Germany), Vol. 57a, 2002, pp 967-973

Mechanism of Ruthenium (III) Catalysed Tl(III) Oxidation of Di and Trisubstituted Phenols in Aqueous Acetic Acid : A Kinetic Study

K R Bhat[1], K Jyothi[2], B Thimme Gowda[3]

[1,2&3] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

The kinetics of Ru(III) catalysed T1(III) oxidation of 2,3-dimethyl, 2,4-dimethyl, 2,5-dimethyl, 2,6-dimethyl, 3,4-dimethyl, 3,5-dimethyl, 2,3-dichloro, 3,4-dichloro, 3,5-dichloro, 2,3,4-trichloro and 2,3,6-trichloro phenols has been studied in aqueous acetic acid. In the presence of perchloric acid. The kinetics show first order dependence in [Ru(III)], fractional order in [ArOH] and the order in [T1(III)] varies between 0 and 1.Variation in $[H^+]$ has negligible effect on the rates, except at high $[H^+]$, where some retarding effect is observed. These results are explained by a two pathway mechanism, one involving the interaction between Ru(III) and T1(III) to produce highly reactive Ru(V) species which in turn oxidizes in phenol in a fast step and the path involving the rate-determining interaction between Ru(III) and the phenol in which Ru(III) is reduced to Ru(I), the latter in its turn immediately getting oxidized to Ru(III) by T1(III) in afast step. This is supported by the fact that the uncatalysed oxidation of phenol by T1(III) is very slow. The constants k_1 and k_2 for both the pathways and the corresponding activation parameters are computed. Further, E_a of all the phenols are optimized corresponding to the lg A of the parent phenol . Similarly, lg A of all the phenols are optimized corresponding to the E_a of the parent phenol. The E_a of substituted phenols, compared with the parent phenol, are higher with the electron withdrawing substituents in the benzene ring and lower with the electron releasing groups. Further, within the category of methyl or chloro groups, substitution at the meta- position increases the energy of activation more than the substitution at the ortho- or para- position and the rates are correspondingly lower and so also the frequency factor. Thus, the reaction is slowest with both meta-positions being occupied and higher with both meta-positions unoccupied.

**Full paper: Oxidation Communications (Europe), Vol. 25, 2002, pp 117-141*

Chlorination of Mixed Substituted Phenols by Sodium Hypochlorite in Aqueous Alkaline Medium: A Kinetic and Mechanistic Study

M C Mary[1], K Jyothi[2], B Thimme Gowda[3]

[1,2&3] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

The kinetics o further chlorination of some mixed substituted phenols such as 2-methyl-4-chloro, 2-chloro-4-nitro, 2-carboxy-5-chloro,3-methyl-4-chloro and 4-chloro-3,5-dimethyl phenols by NaOCl have been studied in aqueous alkaline medium. The reactions show first order kinetics each in [NaOCl] and [ArOH] and inverse fractional to first order in [OH^-]. Variation in either ionic strength of the medium (0.08-0.8 mol dm^{-3}) or addition of Cl^-(0.0-0.1 mol dm^{-3}) had no significant effect on the rates of chlorination. There was wide variation in rates with change of either the nature of the substituent or the site of the substitution. The reaction is accelerated by the presence of electron releasing substituents like -CH_3, particularly so when the group is at the 3rd or 5th positions, whereas the reaction is decelerated by the presence of electron withdrawing substituents like –Cl or -NO_2. The rates are measured at different temperature for all the phenols and the activation parameters have also been optimized with reference to the parent alcohol to see the effect of substitution on them. E_a increases with the introduction of electron withdrawing groups into the benzene ring, while the introduction of electron releasing groups lowers the value of energy of activation for the reaction. Further, it is also observed that the increase in E_a is more prominent when the electron withdrawing groups re at *ortho*-and *para*-positions with reference to the phenoxide ion and similarly the decrease in E_a is more prominent when the electron releasing groups at *meta*-positions with respect to the phenoxide ion. Also the lg A decreases with the introduction of electron withdrawing groups into the benzene ring, while lg A increases on substitution of the electron releasing groups.

Full paper: Oxidation Communications (Europe), Vol. 25, 2002, pp 92-101

Crystal Structure Studies on p-Substitutedbenzenesulphonamides, 4-X-$C_6H_4SO_2NH_2$ (X = CH_3, NH_2 F, Cl or Br)

B T Gowda[1], K Jyothi[2], J Kozisek[3], H Fuess[4]

[1&2] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru
[3]Department of Physical Chemistry, Solvak University of Technology, Bratislava, Solvak Republic
[4] Institue of material science, Darmstadt University of technology, darmstadt, German

ABSTRACT

Effect of ring substitution on the crystal structures of p-substitutedbenzenesulphonamides, p- $XC_6H_4SO_2NH_2$(X=F, Cl ,Br, CH_3 or NH_2) has been studied by determining the crystal structures of 4-chlorobenzenesulphonamide (4-$ClC_6H_4SO_2NH_2$) and 4-bromobenzenesulphonamide (4-$BrC_6H_4SO_2NH_2$) and analyzing the results along with the structures of 4-methylbenzenesulphonamide (4-$CH_3C_6H_4SO_2NH_2$), 4-fluorobenzene-sulphonamide (4-$FC_6H_4SO_2NH_2$) and 4-aminobenzenesulphonamide (4- $NH_2C_6H_4SO_2NH_2$). The crystal type, space group, formula units and lattice constants in A^o of few structures are (4-$ClC_6H_4SO_2NH_2$);monoclinic,$P2_1/n$, Z=4, a=6.6276(10), b=16.219(3), c=7.5716(10), β=93.387(14)^o; (4-$BrC_6H_4SO_2NH_2$): monoclinic,$P2_1/n$, Z=4, a=6.5660(10), b=16.4630(10), c=7.6900(10), β=97.760(10)^o. Orientation of the amine group with respect to the phenyl ring is given by the torsion O(2) with respect to the ring are given by torsion angles. The comparison of bond lengths and bond angles of 4-fluoro-, 4-chloro-, 4-bromo-, 4-methyl- and 4-amino-benzenesulphonamides reveal that the S-N and C-S bond lengths decrease with the introduction of electron withdrawing substituents such as F, Cl, or Br, while these groups do not have significant effects on the S-O distances. The effect on ring C-C distances was not uniform. Substitution of F, Cl or Br decreases the O-S-N bond angle, but increases the O-S-N, N-S-C (1) and C(3)-C(4)-C(5) bond angles .

**Full paper: Zeitschrift für Naturforschung (Germany), Vol. 58a, 2003, pp. 656-660*

Infrared, ^{1}H and ^{13}C NMR Spectra of N,N-Dichloroarylsulphonamides, 4-X-$C_6H_4SO_2NCl_2$ (X = H, CH_3, C_2H_5, F, Cl or Br) and i-X, $YC_6H_3SO_2NCl_2$ (i-X, j-Y = 2,3-$(CH_3)_2$, 2,4-$(CH_3)_2$, 2,5-$(CH_3)_2$, 2-CH_3, 4-Cl, 2-CH_3, 5-Cl, 3-CH_3, 4-Cl, 2, 4-Cl_2 or 3, 4-Cl_2)

B Thimme Gowda[1], K Jyothi[2], N Damodara[3]

[1,2&3] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

Several mono- and di-substituted N, N-dichloroarylsulphonamides of the configuration, 4-$XC_6H_4SO_2NCl_2$ (where X=H, CH_3,C_2H_5,F,Cl or Br) and i-X, j-$YC_6H_3SO_2NCl_2$ (where i-X, j-Y =2,3 –($CH_3)_2$; 2,4 –($CH_3)_2$; 2,5 –($CH_3)_2$; 2- CH_3, 4-Cl; 2-CH_3, 5-Cl; 3-CH_3, 4-Cl; 2,4-Cl_2 or 3,4-Cl_2) respectively were prepared, characterized and their infrared spectra in the solid state and NMR spectra in solution re measured and correlated. Comparison of the infrared spectra of the potassium salts of N,N-dichloroarylsulphonamides with the corresponding arylsulphonamides and N-chloroarylsulphonamides revealed that the infrared absorption bands in the ranges, 790-735cm^{-1} and 595-546 cm^{-1} are due to N-Cl asymmetric and symmetric stretching vibrations, respectively, and that the effect of ring substitution on the N-Cl frequencies is not consistent.. The frequencies in the ranges 1384-1333cm^{-1} and 1181-1143cm^{-1} are, respectively assigned to S=O asymmetric and symmetric modes of vibrations. The effect of substitution in the phenyl ring in terms of electron withdrawing and electron donating groups is non-systematic. Since the chemical shift depends on the electron density around nucleus, empirical correlations relating the chemical shifts to the structures have been considered. The chemical shifts of aromatic protons and carbons in all the N,N-dichloroarylsulphonamides have been calculated by adding substituent contributions to the shift of benzene. Considering the approximation made, the agreement between the calculated and experimental chemical shifts is good.

**Full paper: Zeitschrift für Naturforschung (Germany), Vol. 58a, 2003, pp. 563-568*

^{35}Cl NQR and Structural Studies on Substituted Amides, $X_yC_6H_{5-y}NHCOR$ (X = H or Cl; y = 0, 1 or 2 and R = $C(CH_3)_3$, $CHClCH_3$, C_6H_5 or 2-ClC_6H_4)

B T Gowda[1], K Jyothi[2], H Paulus[3], H Fuess[4]

[1&2] Dept of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru
[3&4] Institute of Material Science, Darmstadt University of Technology, Darmstadt, German

ABSTRACT

^{35}Cl NQR frequencies of some N-(substitutedphenyl)-amides represented by the general formula, $X_yC_6H_{5-y}SO_2NHCOR$ (where X=H or Cl; y= 0,1 or 2 and R=H, CH_3, CH_2CH_3,CH (CH_3)$_2$, C(CH_3)$_3$, CH_2Cl,$CHCl_2$ or CCl_3) have been measured and compared with those of other compounds in the family to analyse the effect of substitution in the isde chain on the frequencies. Comparison of ^{35}Cl NQR frequencies of all the N-(2-chlorophenyl)- and N-(2,6-dichlorophenyl)- amides reveals that the presence of alkyl groups in the side chain lowers the frequency, while that of aryl or chloro-substituted alkyl groups enhance the frequencies to some extent. When compared to the frequencies of either N-(2-chlorophenyl)- acetamide or N-(2,6-dichlorophenyl)- acetamide. In addition, the crystal structures of N-(phenyl)-2-chloro-2-methylacetamide ($C_6H_5NHCOCHClCH_3$) and N-(phenyl)-2-chloro-benzamide (C_6H_5NHCO-(2-ClC_6H_4)) have been determined and the data analysed along with the crystal structures of related compounds. The data (lattice constants in A$^\circ$) of new structures are: C_6H_5NHCO-$CHClCH_3$: monoclinic,$P2_1/c$, Z=4, a=10.879(2), b=9.561(2), c=10.067(2), β=116.080(10)^0; C_6H_5NHCO-(2-ClC_6H_4): tetragonal,P4(3), Z=4, a=8.795(4), b=8.795(4), c=15.115(6), β=90.0^0. It is evident from a comparison, that the side chain substitution influences the C(S)-C(O) bond length, while the effect on the other bond lengths is not significant except for benzanilide. Similarly, only the side chain angles are affected to some extent. The variations do not show definite trends, probably due to the differences in the crystallizations

Full paper: Zeitschrift für Naturforschung (Germany), Section A, Vol. 58a, 2003, pp. 225-230

Kinetics and Mechanism of Oxidation of Dimethyl Sulphoxide by Mono and Disubstituted N, N-Dichloro-benzenesulphonamides in Aqueous Acetic Acid

B Thimme Gowda[1], K L Jayalakshmi[2], K Jyothi[3]

[1,2&3] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

In an effort to introduce N, N-dichloroarylsulphonamides of different oxidizing strengths, four mono and five di-substituted N, N-dichlorobenzenelsulphonamides are prepared, characterized and employed as oxidants for studying the kinetics of oxidation of dimethyl sulphoxide (DMSO) in 50% aqueous acetic acid. The reactions show first order kinetics in [oxidant], fractional to first order in the rates, while decrease in dielectric constant of the medium decreases the rates. The results along with those of the oxidation of DMSO by N, N-dichlorobenzenelsulphonamide and N,N-dichloro-4-methylbenzenelsulphonamide have been analysed. Effective oxidizing species of the oxidants employed in the present oxidations is Cl^+ in different forms, released from the oxidants. Therefore the introduction of different substituent groups into the benzene ring of the oxidant is expected to affect the ability of the reagent to release Cl^+ and hence its capacity to oxidize the substrate. Significant changes in the kinetic and thermodynamic data are observed in the present investigations with change of substituent in the benzene ring. The electron releasing groups such as CH_3 inhibit the ease with which Cl^+ is released from the oxidant, while electron –withdrawing groups such as Cl enhances this ability. The Hammett equation, $k_{obs} = -3.19+1.05\sigma$, is found to be vaid for oxidations by all the p-substituted N, N-dichlorobenzenelsulphonamides. The substituent effect on the energy of activation E_a and log A for the oxidations is also analysed. The enthalpies and free energies of activation correlate with an isokinetic temperature of 320 K.

Full paper: Zeitschrift fur Naturforschung (Germany), Section A, Vol. 58a, 2003, pp. 787-794

Infrared, ^{1}H and ^{13}C NMR Spectral Studies on Di- and Tri-substituted N-Aryl Amides, 2,6- $X_2C_6H_3NHCOCH_{3-i}X_i$ and 2,4,6-$X_3C_6H_2NHCOCH_{3-i}X_i$ (X = Cl or CH_3 and i = 0, 1, 2 or 3)

B T Gowda[1], K M Usha[2], K Jyothi[3]

[1,2&3] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

Several di- and tri-substituted amides of the general formula, 2,6-$X_2C_6H_3NHCOCH_{3-i}X_i$ and 2,4,6-$X_3C_6H_2NHCOCH_{3-i}X_i$(X=Cl or CH_3 and i= 0,1,2,or3) are prepared, characterized, and their infrared spectra in the solid state and ^{1}H and ^{13}C NMR spectra in solution are studied. The C=O stretching vibrations of N-(2,6-dichlorophenyl)- and n-(2,6-dimethylphenyl)-amides appear as strong absorptions in the ranges 1707-1658cm^{-1} and 1700-1647cm^{-1}, respectively, while the N-H stretching vibrations of N-(2,6-dichlorophenyl)- and N-(2,6-dimethylphenyl)-amides appear as strong absorptions in the ranges 3271-3209cm^{-1} and 3285-3214cm^{-1}, respectively. The N-H stretching vibrations of N-(2,4,6-trichlorophenyl)- and N-(2,4,6-trimethylphenyl)-amides also appear as strong absorptions in the ranges 3370-3212cm^{-1} and 3283-3225cm^{-1}, respectively, while those of the C=O vibrations appear in the ranges 1688-1617 and 1704-1647 cm^{-1}. The analysis of the C=O and N-H absorption frequencies of all amides of the general formula $X_iC_6H_{5-i}NHCOCH_{3-i}X_i$ (where X=Cl or CH_3 and i= 0,1,2 or 3) indicates that their variations do not show regular trends with substitution either in the phenyl ring or in the side chain. The chemical shifts of both the aromatic protons and the aromatic carbons of all the amides are calculated in two ways, either by adding the incremental shifts due to -$COCH_{3-i}X_i$ groups and the substituents in the benzene ring to the chemical shifts of the corresponding aromatic protons or carbons of the parent aniline, or by adding the incremental shifts due to -$NHCOCH_{3-i}X_i$ groups and the substituents in the benzene ring to the chemical shift of the benzene proton or carbon. The calculated chemical shifts of the aromatic protons and carbons of all the substituted amides by both methods lead to almost the same values in most cases and agree well with the observed chemical shifts, indicating that the principle of additivity of the substituent effects is valid in these compounds.

Full paper: Zeitschrift für Naturforschung (Germany), Section A, Vol. 59a, 2004, pp.69-76

Kinetics and Mechanism of Oxidation of Dimethyl Sulphoxide by Sodium salts of N- Chloro-disubstituted Benzenesulphonamides in Aqueous Acid Medium

N Damodara[1], K Jyothi[2], B Thimme Gowda[3]

[1,2&3] Dept of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

Eight sodium salts of N-chloro-disubstiuted benzenesulphonamides are prepared, characterized and employed for studying the kinetics of oxidation of dimethyl sulphoxide (DMSO) in the presence of perchloric acid at 298K. The reactions show first order kinetics in [oxidant], unit order in [DMSO] and nearly zero order in $[H^+]$. The rates slightly increase with increase in ionic strength of the medium, while decrease in dielectric constant of the medium by the addition of methanol decreases the rates. The observed results have been explained by as plausible mechanism and the related rate law deduced. The results are compared with those of sodium salts of N-chlorobenzenesulphonamide and N-chloro-4-methylbenzenesulphonamide. The oxidative strengths of N-chloroarylsulphonamide depend on the ease with which Cl^+ is released from the reagents as Cl^+ is the effective oxidizing species in the reactions. The ease with which Cl^+ is released from N-chloroarylsulphonamides depends on the electron density on the nitrogen atom of the sulphonamide group. The electron density on the nitrogen atom in turn depends on the nature of the substituent in the benzene ring. Thus, significant changes in kinetic and the thermodynamic data are observed with change of substituent in the benzene ring. The constancy of the free energies of activation may signal the operation of similar mechanism. Validity of the Hammett' and isokinetic relationships has also been tested.

Full paper: Oxidation Communications (Europe), Vol. 27, 2004, pp 167-176

Synthetic, Infrared, ^{1}H and ^{13}C NMR Spectral Studies on Potassium Salts of N- Chloroarylsulphonamides

K Jyothi[1], B T Gowda[2]

[1&2] Dept of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

Several N-chloroarylsulphonamides of the configuration, 4-$XC_6H_4SO_2(K)NCl.xH_2O$ (where X=H, CH_3,C_2H_5,F,Cl or Br) and i-X, j-$YC_6H_3SO_2(K)NCl.xH_2O$ (where i-X, j-Y =2,3 –($CH_3)_2$; 2,4 –($CH_3)_2$; 2,5 –($CH_3)_2$; 2- CH_3, 4-Cl; 2-CH_3, 5-Cl; 3-CH_3, 4-Cl; 2,4-Cl_2 or 3,4-Cl_2) are prepared, chararacterised, and their infrared spectra in the solid state and NMR spectra in solution re measured and correlated. Comparison of the infrared spectra of the potassium salts of N-chloro-arylsulphonamides with corresponding arylsulphonamides shows that the strong absorptions in the range 947-933 cm^{-1} are due to N-Cl stretching vibrations. The effect on the ring substitution on the N-Cl frequencies is non-uniform. The frequencies in the ranges 1404-1370cm^{-1} and 1149-1125cm^{-1} are respectively assigned to S=O asymmetric and symmetric vibrations. The effect of substitution in the phenyl ring in terms of electron withdrawing and electron donating groups is non-systematic. Empirical correlations relating the chemical shifts to the structures are considered. The chemical shifts of aromatic protons and and carbons in all the N-chloro-arylsulphonamides have been calculated by adding substituent contributions to the shift of benzene, as per the principle of substituent addition. Considering the approximation made, the agreement between the calculated and experimental chemical shifts is reasonably good.

**Full paper: Zeitschrift für Naturforschung (Germany), Section A, Vol. 59a, 2004, pp. 64-68*

Infrared Spectra of N-Aryl Substituted Amides 2/4-XC_6H_4NHCOR (R = H, $CH_{3-i}X_i$, C_6H_5 or C_6H_5Cl; X = H, Cl or CH_3 & i = 0, 1, 2 or 3)

B Thimme Gowda[1], K Jyothi[2], N Damodara[3], K L Jayalakshmi[4]

[1,2,3&4] Dept. of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

Several N-(aryl)-substituted amides of the general formula,2/4-XC_6H_4NHCOR (where X=H, Cl or CH_3 and R=H, CH_3, CH_2CH_3 , $CH(CH_3)_2$, $C(CH_3)_3$, C_6H_5 or C_6H_5Cl) are prepared, characterized and their infrared spectra measured in the solid state and analysed. Generally chloro substitution in the side chain increases the C=O absorptions, while that of methyl groups lower the wave numbers. Amides with trimethyl substituted side chains absorb at higher wavenumbers. But the N-H and C-N stretching vibrations do not show particular trends on side chain substitution. This may be due to the fact that the spectra were recorded in the solid state and the compounds may crystallize in different forms in the solid state. The intercorrelations of C=O and N-H absorption frequencies of all the amides have been made. The correlations are reasonably linear with some exceptions for the reason stated above.

Full paper: Journal of Indian Chemical Society (India), Vol.82, 2005, pp 1-5

N, N, 4-Trichlorobenzenesulfonamide, -Crystal Structure

Manu Lahtinen[1], Jyothi Damodara[2], Poornima Upadhyaya[3], Nonappa[4], Erkki Kolehmainen[5]

[1,4&5] Department of Chemistry, University of Jyvaskyla, Finland
[2&3] Department of Chemistry, St. Joseph Engineering College, Mangaluru

ABSTRACT

The structure of the title compound (NNDC4CBSA), $C_6H_4Cl_3NO_2S$, resembles that of *N*,*N*-dichloro-4-methylbenzenesulfonamide (NNDC4MBSA). In particular, the structure is relatively simple, unlike those of the sodium salts of *N*-chloroarylsulfonamides. Furthermore, the S-N distance of 1.759 (5) Å is consistent with the value of 1.735 (5) Å observed with NNDC4MBSA, the value for an S-N single bond. The molecules are packed into zigzag chains in the direction of the *a* axis.

**Full paper: Acta Crystallography (U.K.), Vol. E63, 2007, pp. o2905*

Sodium 4, N-dichloro- benzene-sulfonamide sesquihydrate, -Crystal Structure

B Thimme Gowda[1], K Jyothi[2], Sabine Foro[3], J Kozisek[4], H Fuess[5]

[1&2] Department of Chemistry, Mangalore University, Mangalagangothri, Mangaluru
[3&5] Institute of Material Science, Darmstadt University of Technology, Darmstadt, Germany
[4] Department of Physical Chemistry, Solvak University of Technology, Bratislava, Solvak Republic

ABSTRACT

The structure of the title compound, $Na^+ C_6H_4Cl_2NO_2S^- \cdot 1.5H_2O$, resembles the structures of the sodium salts of *N*-chlorobenzenesulfonamide, *N*-chloro-4-methylbenzenesulfonamide and *N*-chloro-2-methyl-4-chlorobenzenesulfonamide. There are two formula units per asymmetric unit. There is no interaction between N and Na, and the Na^+ cation is attached to three O atoms from water molecules and three sulfonyl O atoms of three different 4,*N*-dichlorobenzenesulfonamide anions. There are several hydrogen bonds. The S-N distances of 1.584 (5) and 1.590 (5) Å are consistent with an S=N double bond.

**Full paper: Acta Crystallography (U.K.), Vol. E63, 2007, pp. m1644-m1645*

Kinetics and Mechanism of Oxidation of D-Fructose and D-Glucose by Sodium Salts of N-Chloro-mono/ di-Substituted Benzenesulphonamides in Aqueous Alkaline Medium

B Thimme Gowda[1], N Damodara[2], K Jyothi[3]

[1,2&3] Dept of Post-Graduate Studies and Research in Chemistry, Mangalore University, Mangalagangothri, Mangaluru

ABSTRACT

In an affort to introduce N- chloroarylsulfonamides of different oxidizing strengths, nine sodium salts of mono-and di-substituted N-chloroarylsulfonamides are employed as oxidants for studying the kinetics of oxidation of D-fructose and D-glucose in aqueous alkaline medium. The results are analyzed along with those by the sodium salts of N-chlorobenzenesulfonamide andN-chloro-4-methylsulfonamide. The reactions show first-order kinetics each in [oxidant],[Fru/Glu], and [OH^-]. The rates slightly increase with increase in ionic strength of the medium. Further, the rate of oxidation of fructose is higher by 4 to 5 times than that of the glucose oxidation, by the same oxidant. Similarly, E_a values for glucose oxidations are higher by about 15 times the Ea values for fructose oxidations. The results have been explained by a plausible mechanism and the related rate law deduced. The significant changes in the kinetics and thermodynamic data are observed with change of substituent in the benzene ring.It is because Cl^+ is the effective oxidizing species in the reactions of N-chloroarylsulfonamides. The oxidative strengths of the latter therefore depend on the ease with which Cl^+ is releases fro them. The ease with which Cl^+ is released from N-chloroarylsulfonamides depends on the electron density of the nitrogen atom of the sulfonamide group, which in turn depends on the nature o the substituent in the benzene ring. The following Hammett equations are valid for the oxidation of fructose and glucose. $\log k_{obs} = -3.13 + 0.54\sigma p$ and $\log k_{obs} = -3.81 + 0.28\sigma p$ respectively. The enthalpies and entropies of activations for oxidations by all the N-chloroarylsulfonamides correlate well with isokinetic temperatures of 301K and 299, for fructose and glucose oxidations, respectively. The effect of substitution in the oxidants on the E_a and log A for the oxidations is also considered.

**Full paper: International Journal of Chemical Kinetics (U.S.A), Vol. 37, 2007 pp.572-582*

N-{4-[(3-Methylphenyl) sulfamoyl]-phenyl} benzamide

Manu Lahtinen[1], Jyothi Damodara[2], Poornima Upadhyaya[3], Nonappa[4], Erkki Kolehmainen[5]

[1,4&5] University of Jyvaskyla, Department of Chemistry, Finland
[2&3] Department Of Chemistry, St. Joseph Engineering College, Mangaluru

ABSTRACT

The asymmetric unit of the title compound, $C_{20}H_{18}N_2O_3S$ contains a single molecule. The dihedral angles between the central phenyl group and amide group is about 24.1 (3)° and the tilting of terminal groups bonded to the sulfonamide is about 111.8 (16)°. A short intramolecular C-H···O contact occurs. The crystal structure is stabilised by inter molecular N-H···O hydrogen bonds with moderate d(D···A) bond distances of 2.813 (2)Å and 3.062 (2)Å. Extensive weak π-π interactions exist in the structure as both face-to-face and face-to-edge interactions occur between the phenyl rings.

Full paper: Acta Crystallography (U.K.), Vol. E67, 2011, pp. o2866

A Note on Modular Pairs and Orthomodularity in Posets

S Parameshwara Bhatta[1], Ramananda H S[2]

[1&2]Department of Mathematics, Mangalore University, Mangalagangothri, Karnataka

ABSTRACT

A negative solution to an open problem posed on modular pairs in orthocomplemented posets is obtained by constructing a counterexample. Some relations between join-irreducible elements and modular pairs are discussed. It is also observed that orthomodular posets of finite length are strong and balanced.

*Full paper: *Journal of Indian Mathematical Society, Vol. 76, 2009, pp.11-18*

On Ideals and Congruence Relations in Trellises

S Parameshwara Bhatta[1], Ramananda H S[2]

[1&2]Department of Mathematics, Mangalore University, Mangalagangothri, Karnataka

ABSTRACT

In this paper an attempt has been made to extend the ideal theory of lattices to trellises. Hashimoto's results concerning ideals and congruences in lattices are extended to trellises. Also a characterization of trellises in which every ideal is the kernel of at most one congruence relation is obtained by extending the corresponding well-known result in lattices due to Gratzer and Schmidt.

*Full paper: *Acta Mathematica Universatis Comenianae, Vol. 2, 2010, pp.209-216*

A Note on Irreducible Elements in a Finite Poset

S Parameshwara Bhatta[1], Ramananda H S[2]

[1&2]Department of Mathematics, Mangalore University, Mangalagangothri, Karnataka

ABSTRACT

Let P be a finite poset. In this paper a Boolean poset B is constructed such that there is a cover preserving embedding of P in B .

In addition it is proved that the number of maximal chains in P is at most equal to the number of linear extensions of join-irreducibles of P.

Full paper: International Journal of Algebra, Vol. 4, 2010, pp.669-675

Natural Extension of a Congruence of a Lattice to its Lattice of Convex Sublattices

S Parameshwara Bhatta[1], Ramananda H S[2]

[1&2]Department of Mathematics, Mangalore University, Mangalagangothri, Karnataka

ABSTRACT

Let L be a lattice. In this paper, corresponding to a given congruence relation □ of L, a congruence relation Ψ on CS (L) is defined and it is proved that

1. CS (L/ □) is isomorphic to CS (L)/ Ψ .
2. L/ □ and CS (L)/ Ψ are in the same equational class.
3. if □ is representable in L, then so is Ψ in CS(L).

**Full paper: Archivum Mathematicum (Brno), Vol.47, 2011, pp. 133-138*

Growth and Characterization of an organic NLO Crystal: 1-(4-methylphenyl)-3-(4-methoxyphenyl)-2-propen-1-one

Vincent Crasta[a], V Ravindrachary[b], R F Bhajantri[b], Richard Gonsalves[c]

[a]Department of Physics, St. Joseph Engineering College, Mangaluru
[b]Department of Physics, Mangalura University, Mangalagangotri, Mangaluru
[c]Department of Chemistry, St Aloysius College, Mangaluru

ABSTRACT

A novel organic nonlinear optical material 1-(4-methylphenyl)-3-(4-methoxyphenyl)-2-propen-1-one has been synthesized by the standard method. The synthesized compound was purified by repeated re-crystallization. FT-IR spectra was recorded to identify the various functional groups present in the compound. Good quality crystals were grown by slow evaporation technique using acetone/DMF as solvents. The grown crystals are having the dimension of $25x15x2mm^3$ and these were characterized by UV-visible and powder X-ray diffraction. From the XRD study, it is found that, the crystals are in the monoclinic system with a space group P21/a. Refractive index of the crystal was measured using Brewster's angle method. The second harmonic generation (SHG) efficiency of the crystal was obtained Using ND-YAG laser (l ¼ 1064 nm), which is found to be 0.5 times that of Urea.

Full paper: Journal of Crystal Growth, Vol. 267, Issue No.1-2, 2004, pp. 129-133

Growth and Characterization of Chalcone Derivative Single Crystal

V Ravindrachary[a], Vincent Crasta[a], R F Bhajantri[a], Boja Poojari[b]

[a]Department of Physics, Mangalore University, Mangalagangotri, Mangaluru
[b]Department of Chemistry, Mangalore University, Mangalagangotri, Mangaluru

ABSTRACT

A novel organic non-linear optical material 1-(4-methylphenyl)-3-(4- N, N dimethyl amino phenyl)-2-propen-1-one has been synthesized by the standard method. The synthesized compound was purified by repeated re-crystallization process. To confirm the synthesized compound an FT-IR spectra was recorded and the various functional groups present in the compound were identified. Good quality crystals were grown by slow evaporation technique using acetone as solvent. The grown crystals were characterized by UV–Visible and powder X-ray diffraction (XRD) studies. The XRD study, revealed that the crystals are in the orthorhombic system with a space group P212121 and the corresponding lattice parameters are a ¼ 7:3710 (A; b ¼ 11:6200 (A and c ¼ 17:6590 (A: Using optical spectra, the optical energy gap of the crystal is estimated to be 2.40 eV. The refractive index of the crystal is measured using Brewster's angle method and the density using standard method. The second harmonic generation (SHG) efficiency of 0.8 times that of Urea of the crystal was obtained usingND-YAG laser (1064nm).

Full paper: Journal of Crystal Growth, Vol. 275, Issue No.1-2, October-December 2005, pp. e313-318

Growth, Characterization and Crystal Structure Analysis of 1-(4-Chloropheny)-3-(4-Chloropheny1)-2-propen-1-one

Vincent Crasta[a], V Ravindrachary[a], S Lakshmi[b], S N Pramod[b], M A Shridar[b], J Shashidhara Prasad[b]

[a]Department of Studies in Physics, Mangaluru University, Mangalagangotri, Mangalura
[b]Department of Studies in Physics, University of Mysore, Manasagangotri, Mysore

ABSTRACT

Good-quality single crystals of organic non-linear optical material 1-(4-chlorophenyl)-3-(4-chloro phenyl)-2-propen- 1-one were grown by slow evaporation technique. The crystal structure analysis and the molecular arrangement of these crystals are determined using X-ray diffraction (XRD) method. From single-crystal XRD studies, it is found that the compound crystallizes in the monoclinic system with a space group P21/a, and the corresponding lattice parameters were calculated. FT-IR spectra were recorded to identify the various functional groups present in the compound. The biggest grown crystal has the dimension, 18x8x2 mm3 and was characterized using UV visible spectra. The refractive index of the crystal was measured using Brewster's angle method and the second-harmonic generation (SHG) efficiency of 0.7 times that of urea.

Full paper: Journal of Crystal Growth, Vol. 275, Issue No.1-2, 2005, pp.329-335

Single Crystal X-Ray Diffraction, Optical and Micro Hardness Studies on Chalcone Derivative Single Crystal

Vincent Crasta[a], V Ravindrachary[b], R F Bhajantri[b], S Naveen[c], M A Shridar[c], J Shashidhara Prasad[c]

[a]Department of Physics, St. Joseph Engineering College, Mangaluru
[b]Department of Physics, Mangaluru University, Mangalagangotri, Mangaluru
[c]Department of Studies in Physics, University of Mysore, Manasagangotri, Mysore

ABSTRACT

1-(4-methylphenyl)-3-(4- N, N dimethyl amino phenyl)-2-propen-1-one, a chalcone derivative nonlinear optical material has been synthesized by standard method. FT-IR and NMR spectral studies have been performed to confirm the molecular structure of the synthesized compound. The single crystals up to a dimension of 13 x 9 x 3 mm3 were grown by slow evaporation method. The grown crystals were transparent in the entire visible region and absorbs in the UV region. The refractive index has been measured using a He-Ne laser. The grown crystals have been subjected to single crystal X-ray diffraction studies to determine the crystal structure and hence the cell parameters of the crystal. From this study it is found that this compound crystallizes in orthorhombic system with a space group P_{212121} and corresponding lattice parameters are, a = 7.3610(13) Å, b = 11.651(2) Å, c = 17.6490(17) Å. The Kurtz powder second harmonic generation test shows that the compound is a potential candidate for Photonic application. The micro hardness test on these crystals were carried out and the load dependence hardness was observed

**Full paper: Proceedings of the SPIE, doi: 10.1117/12.616842, Vol. 5935, 2005, Bellingham*

Optical, Dielectric and Micro Hardness Studies on 1-(4-Methylphenyl)-3-(4-Methoxyphenyl)-2-Propen-1-One: A Nonlinear Optical Single Crystal

V Ravindrachary[a], Vincent Crasta[b], R F Bhjantri[c], J Indira[c]

[a]Department of Physics, Mangalore University, Mangalagangotri, Mangaluru
[b]Department of Physics, St Joseph Engineering College, Mangaluru
[c]Department of studies in Physics, University of Mysore, Manasagangotri, Mysore

ABSTRACT

Single crystals of nonlinear optical material 1-(4-methylphenyl)-3-(4-methoxyphenyl)-2-propen-1-one were successfully grown for the first time by slow evaporation method up to a dimension 25 x 15 x 2 mm3. Optical studies such as UVVisible, energy band gap, refractive index, second harmonic efficiency have been performed. The UV-Visible spectrum reveals that the crystal is transparent in the entire visible region and absorption takes place in the UV-region. Using UVVis data, the energy band gap was found and it shows an energy band gap of 2.7eV for this material. The refractive index was measured using Brewster's angle method. The Kurtz powder second harmonic generation test shows that the compound is a potential candidate for photonic applications. From the I-V measurements the dc conductivity of these crystals has been studied and it is found to be very low. Dielectric constant, dielectric loss and ac conductivity of a grown single crystal have been studied in the frequency range 120Hz to 100 kHz at the room temperature and proper interpretations were drawn. The micro hardness test was carried out and the load dependence hardness was studied.

**Full paper: Proceedings of the SPIE, doi: 10.1117/12.616642 Vol. 5935, 2005, Bellingham*

Microstructural Studies on BaCl2 doped poly (vinyl alcohol)

R F Bhajantri[a], V Ravindrachary[a], A Harisha[a], Vincent Crasta[c], Suresh P Nayak[b], Boja Poojary[b]

[a]Department of Studies in Physics, Mangaluru University, Mangalagangotri, Mangaluru
[b]Department of Chemistry, Mangaluru University, Mangalagangotri, Mangaluru
[c]Department of Physics, St. Joseph Engineering College, Mangaluru

ABSTRACT

We have studied the effect of BaCl2 dopant on the optical and microstructural properties of a polymer poly(vinyl alcohol) (PVA). Pure and BaCl2 doped PVA films were prepared using solvent casting method. These films were characterized using FTIR, UV–visible, XRD and DSC techniques. The observed peaks around 3425 cmK1, at 1733 cmK1 and 1640 cmK1 in the FTIR spectra were assigned to O–H, CaC stretching and acetyle CaO group vibrations, respectively. In the doped PVA shift in these bands can be understood on the basis of intra/inter molecular hydrogen bonding with the adjacent OH group of PVA. The UV–visible spectra shows the absorption bands around 196 nm and shoulders around 208 nm with different absorption intensities for doped PVA, which are assigned to n/p* transition. This indicates the presence of unsaturated bonds mainly in the tail–head of the polymer. Optical band energy gap is estimated using UV–visible spectra and it decreases with increasing dopant concentration. The powder XRD shows an increase in crystallinity in the doped PVA, which arises due to the interaction of dopant with PVA causing a molecular rearrangement within the amorphous phase of polymer. These modifications also influence the optical property of the doped polymer. The DSC study also supports increasing crystalline thickness and degree of crystallinity due to doping.

Full paper: Polymer, Vol. 47, Issue No.10, 2006, pp.3581-3598

Optical and XRD Studies of an Organic Single Crystal

Rajesh Kumar P C[1], V Ravindrachary[2], Vincent Crasta[1]

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

ABSTRACT

Organic compound of 1-(4methoxyphenyl)-3-(4-chlorophenyl)-2-propen-1-one was synthesized using Claisen–Schmidt condensation reaction method. The single crystals were grown using slow evaporation solution growth technique. Optical studies such as UV-Visible, refractive index, second harmonic efficiency have been performed. The UV-Visible spectrum reveals that the crystal is transparent in the entire visible region and absorption takes place in the UV-region. The refractive index is measured using Brewster's angle method. The Kurtz powder second harmonic generation test shows that the compound is non-linear optically active in nature and is considered to be a potential candidate for photonic applications. The powder XRD was carried out and it confirms he crystallinity of the compound.

**Full paper: National Conference on Advanced Materials, Devices and Technologies (NCAMDT), 20-22nd February, 2008, S.V University, Tirupati, India*

Studies on Fluorescent PVA+PVP+MPDMAPP Composite Films

R F Bhajantri[1], V Ravindrachary[1], Boja Poojary[2], Ismayil[1], A Harisha[1], Vincent Crasta[3]

[1]Department of Physics, Mangalore University, Mangalagangotri, Mangaluru
[2]Department of Chemistry, Mangalore University, Mangalagangotri, Mangaluru
[3]Department of Physics, St. Joseph Engineering College, Mangaluru

ABSTRACT

Polymer blends along with 1-(4-methylphenyl)-3-(4-N,N, dimethyl amino phenyl)-2-propen-1-one (MPDMAPP) NLO-chromophore-doped composite films were prepared by solvent casting method using DMF. The optical properties were studied using UV–visible, refractive index, steady state fluorescence, and fluorescence microscopic imaging techniques. The UV–vis absorption spectra showed three absorption bands and were assigned to localized n?p*, n?p* inter band, and p?p* transition of charge transfer groups. The observed changes in the absorption peak, edges, and intensity with dopant concentration are understood based on charge transfer complex (CTC) formation. The refractive indices of the composite films varied from 1.4937–1.5398 for red and 1.5165–1.5516 for green light respectively. The steady state fluorescence data showed both emission peak wavelengths and intensity changes with MPDMAPP doping level in blend. The fluorescence anisotropy (r) variations in the composite films indicate the suppressed molecular motion of MPDMAPP in the solid composite film. The fluorescence microscopic image of these composite films showed that the films are photochromatic in nature. These modified properties are thought to be due to the charge transfer upon excitation from the donor to the acceptor connected through benzene ring and CTC formation.

**Full paper: Polymer Engineering and Science, DOI 10.1002/pen.21341, Vol. 49, Issue No.5, 2009, pp.903-909*

Dielectric Studies on Swift Heavy Ions and Electron Irradiated Organic Single Crystal

Vincent Crasta[a], V Ravindrachary[b], P C Rajesh Kumar[a], S Ganesh[c]

[a]Department of Physics, St. Joseph Engineering College, Mangaluru
[b]Department of Studies in Physics, Mangaluru University, Mangalagangotri, Mangaluru
[c]Microtron Centre, Department of Studies in Physics, Mangaluru University, Mangalagangotri, Mangaluru

ABSTRACT

Single crystals of 1-(4-methylphenyl)-3-(4,N,N-dimethylamino phenyl)-2-propen-1-one were irradiated with 72MeV swift heavy ions of C-12 with different fluencies 5 x 1011, 1x1012 and electrons with energy 8MeV for a dose of 2.25kGy. The changes in the dielectric properties of these crystals have been studied. The study shows that the dielectric constant increases first and then decreases with the increase of fluence. This variation has been discussed and possible explanations are given. The variation of dielectric loss and the ac conductivity indicates that there is some structural modification within the crystal due to irradiation. The electron irradiation induced ionic polarizibility within the crystal along the electron path, which is reflected in increase in dielectric constant and hence the conductivity

**Full paper: AIP Conference Proceedings, doi: 10.1063/1.3605787, Vol. 1349, Issue No. 163, 2011, pp.163-165*

Optical, Dielectric and Second Order Non-Linear Properties of a Chalcone

P C Rajesh Kumar[1], Vincent Crasta[1], V Ravindrachary[2], K Janardhana[2]

[1]Department of Physics, St. Joseph Engineering College, Mangaluru
[2]Department of Physics, Mangalore University, Mangalagangotri

ABSTRACT

A new chalcone 1-(4-methylphenyl-3-(4-chlorophenyl)-2-propen-1-one [MCP] was synthesized using Claisen–Schmidt condensation reaction method. The FTIR study was carried out for structural conformation. The single crystals were grown using slow evaporation solution growth technique. Optical studies, UV-Visible, second harmonic efficiency have been performed. The UV-Visible spectrum reveals that the crystal is transparent in the entire visible region and absorption takes place in the UV-region. The Kurtz powder second harmonic generation test shows that the compound is non-linear optically active and have NLO efficiency 0.6 times that of urea and is considered to be a potential candidate for photonic applications. Powder XRD study reveals the good crystallinity of the material.

Full paper: National Conference on Modern Trends in Science & Technology (MTST), 11th-12th October 2011, MVIT, Moodbidri, India

Crystal Growth, NLO Properties of a Pseudo Symmetric Organic Crystal

P C Rajesh Kumar[1], V Ravindrachary[2], K Janardhana[2], H R Manjunath[3], Vincent Crasta[1], M A Sridhar[3]

[1]Department of Physics, St. Joseph Engineering College, Mangaluru
[2]Department of Physics, Mangaluru University, Mangalagangotri
[3]Department of Studies in Physics, University of Mysore, Mysore

ABSTRACT

Organic compound of 1-Phenyl-3-(4-chlorophenyl)-2-propen-1-one [PCPP] was synthesized using Claisen–Schmidt condensation reaction method. Very good single crystals were grown up to the size 17x6x4 mm^3 using slow evaporation solution growth technique. The FTIR and NMR studies were carried out for structural conformation. Optical studies such as UV-Visible, second harmonic efficiency have been performed. The UV-Visible spectrum reveals that the crystal is transparent in the entire visible region and absorption takes place in the UV-region. The Kurtz powder second harmonic generation test shows that the compound is non-linear optically active and have NLO efficiency 0.5 times that of urea and is considered to be a potential candidate for photonic applications. The single-crystal XRD was carried out and the crystal parameters were determined. It is found that the compound crystallizes in the monoclinic system with a space group P21/c. The thermal study reveals that thermal stability of the crystal is good and dielectric study shows that the grown crystal is of high quality.

**Full paper: International Conference on Advanced Materials and its Applications, (ICAMA), 4th-5th March, 2011, Kalasalingam University, Tamilnadu*

Synthesis and Characterization of Organic NLO Compound

Rajesh Kumar P C[1], V Ravindrachary[2], K Janardhana[2], H R Manjunath[3], Prakash K[4]

[1]Department of Physics, St. Joseph Engineering College, Mangaluru
[2]Department of Physics, Mangalore University, Mangalagangotri
[3]Department of Studies in Physics, University of Mysore
[4]Sequent Scientific Ltd. Mangaluru

ABSTRACT

Organic compound 1-(2 thiophene)-3-(2, 3, 5-trichlorophenyl)-2-propen-1-one [TTCP] with molecular formula C13H7Cl3OS was synthesized using condensation reaction method. FT-IR spectra were recorded to identify the various functional groups present in the compound. The third harmonic optical nonlinearity test was carried out using zscan technique. The single crystals were grown using slow evaporation solution growth technique. Optical absorption studies reveal that the crystal is transparent in the entire visible region and absorption (around 364nm) takes place in the UV-region. The single-crystal XRD studies were carried out, and it was found that the compound crystallizes in the monoclinic system with a space group P21/c. The observed lattice parameters are a = 16.6170(6) Å b = 7.6180(5) Å c = 10.9280(11) Å and V= 1338.47(17) $Å^3$.

Full paper: AIP Conference Proceedings, Vol. 1349, Issue No. 1291, 2011, pp. 1291-1292

Third Order Optical Nonlinearity of a Pyrazoline Derivative

K Janardhana[1], V Ravindrachary[1], P C Rajesh Kumar[1], Yogisha[2], Bhoja Poojary[3], K B Manjunatha[4], Ismayil[1]

[1]Department of Physics, Mangaluru University, Mangalagangotri
[2]Department of Chemistry, S.R.S College, Chitradurga, Karnataka
[3]Department of Chemistry, Mangaluru University, Mangalagangotri
[4]Department of Physics, National Institute of Technology Karnataka, Surathkal

ABSTRACT

A new pyrazoline derivative 3-phenyl-5-(4-N,N-dimethylaminophenyl)-1*H*-2-pyrazoline (PDHP) was synthesized using standard method. The structure of the compound was established based on 1H NMR spectrum. The third-order optical nonlinear properties of PDHP compound were measured using nanosecond Z-scan method. The measured nonlinear absorption coefficient is 0.27 × 10−10 m W−1. The magnitude of third order susceptibility is Re (3) = −19.94 × 10-13 esu and Im (3) = 5.85× 10-13 esu. These experimental results reveal that the PDHP may be a good candidate for optical limiting applications due to its reverse saturated absorption phenomenon.

Full paper: AIP Conference Proceeding, Vol. 1349, Issue No.1319, 2011, pp. 1319-1320

Growth, Characterization, Crystal and Molecular Structure Studies of 1-(2-Thiophen)-3-(2,3,5-Trichlorophenyl)-2-Propen-1-One

H R Manjunath[1], P C Rajesh Kumar[2], S Naveen[3], V Ravindrachary[4], M A Sridhar[1], J Shashidhara Prasad[5], Prakash Karegoudar[6]

[1]Department of Studies in Physics, University of Mysore, Mysore
[2]Department of Physics, St. Joseph Engineering College, Mangaluru
[3]Department of Physics, Sri Bhagawan Mahaveer Jain College of Engineering, Jain University, Bangalore
[4]Department of Physics, Mangaluru University, Mangaluru
[5]Sri Sathya Sai Institute of Higher Learning, Prasanthi Nilayam, Ananthapur
[6]Sequent Scientific Ltd., Mangaluru

ABSTRACT

1-(2-thiophen)-3-(2,3,5-trichlorophenyl)-2-propen-1-one (TTCP)wassynthesized by Claisen-SchmidtCondensationreaction.FT-IR spectra were recorded to identify the functional groups present in the compound.The NLO tes tcarried out on the sample using Z-scan technique confirms the existence of nonlinearity in the third harmonic generation.Further,the compound is characterized by UV-visible spectral studies for the optical transmission.Finally,the structure of the product obtained was confirmed by the X-ray diffraction studies.The compoundcrystallizes in the monoclinic spacegroup P21/c with a=16.6170Å A, b = 7.6180Å, c =10.928 Å and β=104.63^0. The thiophene ring shows planar conformation and is affected by p conjugation.The unsaturated keto group is in þ syn-periplanar conformation.The molecule exhibits both inter and intramolecular hydrogenbonds of the type C–H …. O and C–H ….Cl which can account for the stability of the molecule .

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Optical and Structural Properties of Chalcone NLO Single Crystals

P C Rajesh Kumar[1,2], V Ravindrachary[1], K Janardhana[1], H R Manjunath[3], Prakash Karegoud[4], Vincent Crasta[2], M A Sridhar[3]

[1]Department of Physics, Mangaluru University, Mangalagangotri
[2]Department of Physics, St. Joseph Engineering College, Mangaluru
[3]Department of Studies in Physics, University of Mysore, Mysore
[4]Soquent Scientific Ltd., Mangaluru

ABSTRACT

Organic compound (E)-1-(4-methoxyphenyl)-3-(2,3,5-trichlorophenyl)prop-2-en-1-one [MPTCPP] with molecular formula C16H11Cl3O2 was synthesized using Claisen–Schmidt condensation reaction method. 1H NMR spectra was recorded to identify the various functional groups present in the compound and confirm the chemical structure. The single crystals were grown using slow evaporation solution growth technique. The UV–Visible spectrum study reveals that the crystal is transparent in the entire visible region and the absorption is observed at 364 nm. The Kurtz powder second harmonic generation (SHG) test shows that the MPTCPP is NLO active and its SHG efficiency is three times that of urea. Single crystal XRD study shows that the compound crystallizes in the monoclinic system with a space group Cc. The corresponding lattice parameters of the crystal are a = 28.215(5) Å, b = 3.9740(4) Å, c = 16.178(3) Å and V = 1503.0(4) Å^3. The micro hardness test was carried out and the work hardening coefficient value (n) of the crystal was found to be 1.48. This indicates that the crystal is hard and is suitable for device application. The thermal study reveals that the thermal stability of the crystal is good.

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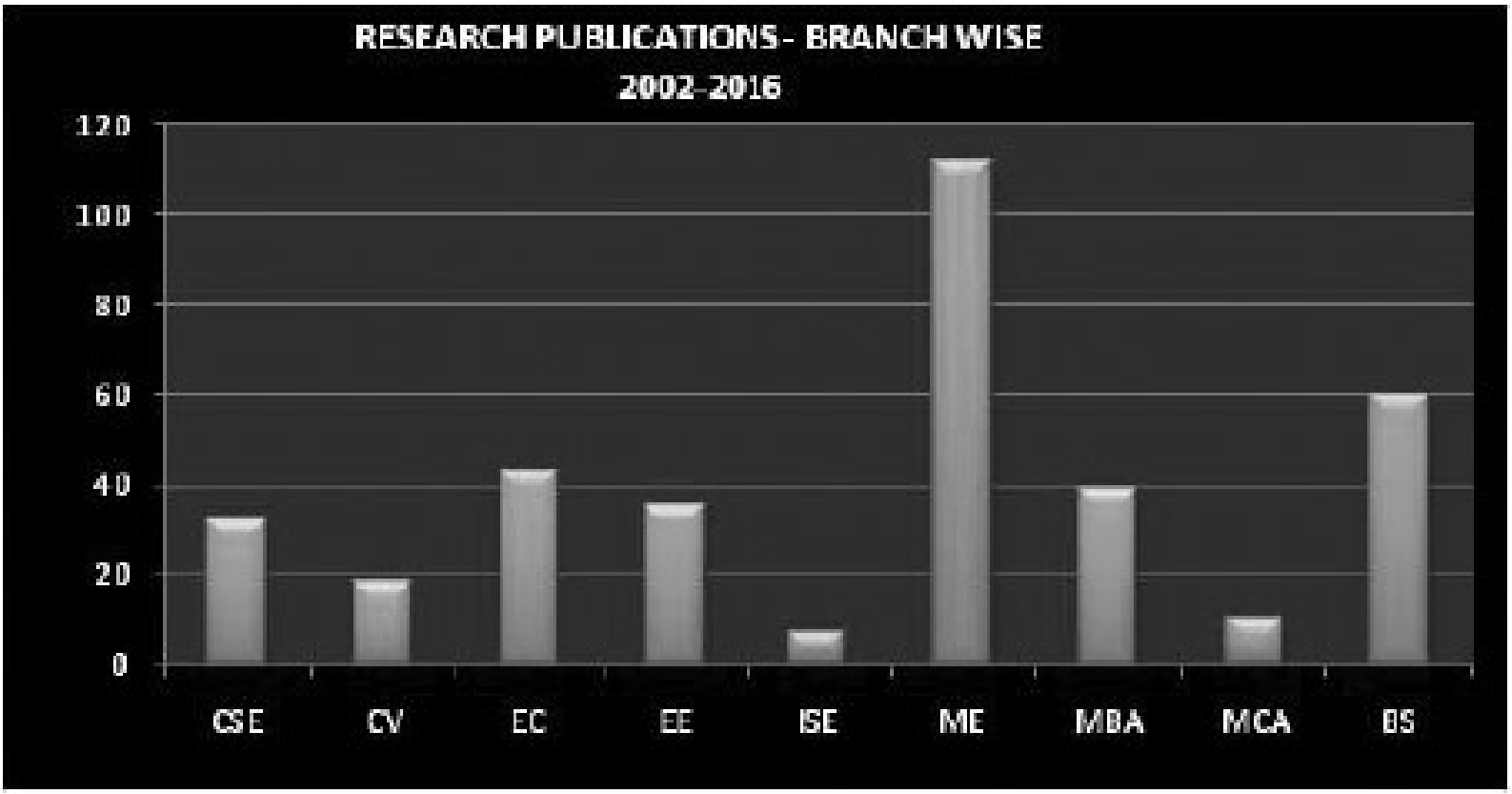

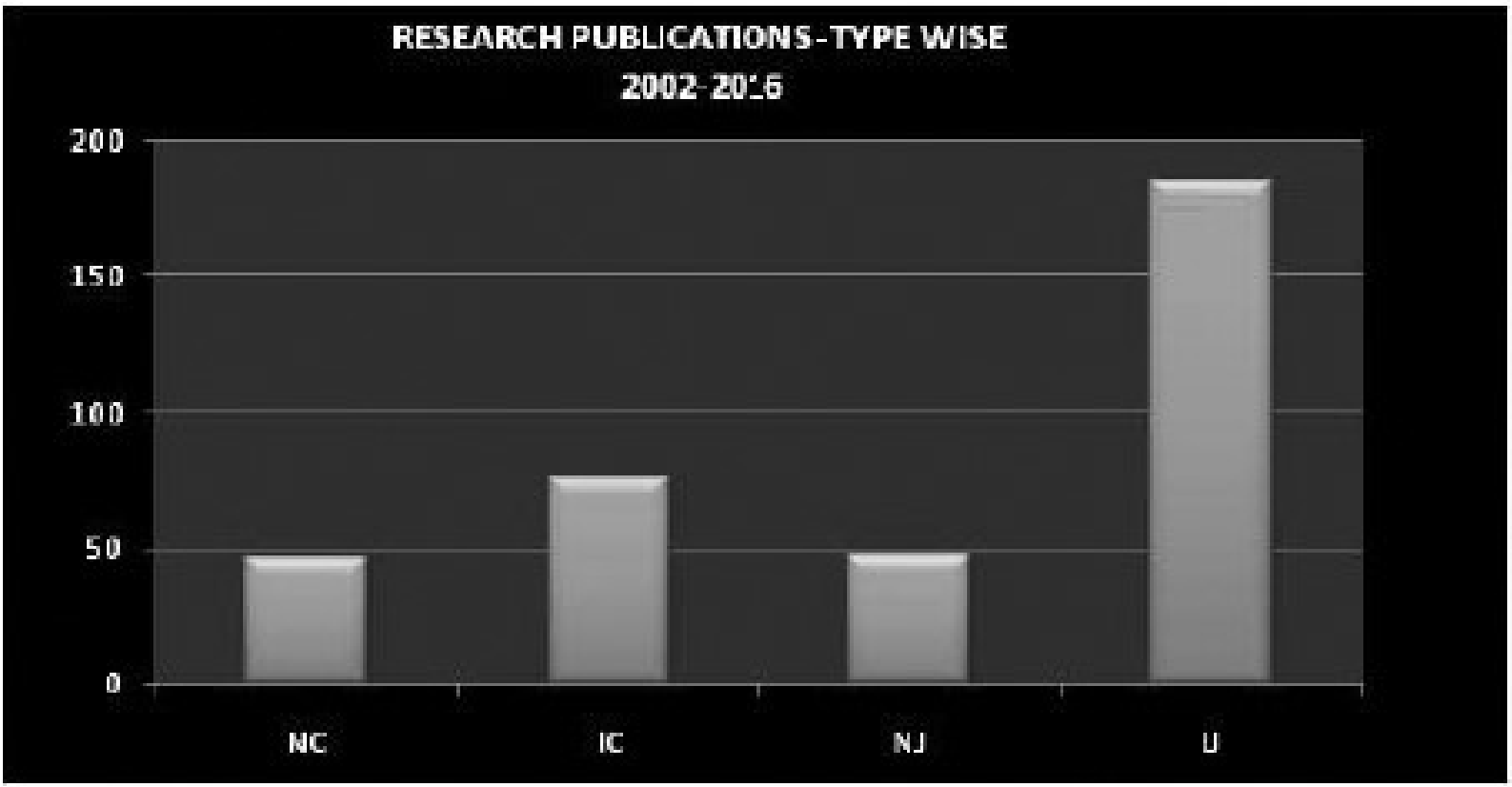

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Affiliated to Visveswaraya Technological University and recognized by All India Council for Technical Education

Vamanjoor, Mangaluru - 575 028

Website: www.sjec.ac.in E-mail: sjec@sjec.ac.in Ph: 91-824-2263753/54/56 Fax: 91-824-2263751