Volume 4 Issue 9, February 2015

International Journal of Innovative Technology and Exploring Engineering

IJITEE

ISSN : 2278 - 3075
Website: www.ijitee.org

Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd.
Exploring Innovation: A Key for Dedicated Services

Address:
22, First Floor, ShivLoke Phase-IV,
Khajuri Kala, BHEL-Piplani, Bhopal (M.P.)-462021, India
Website: www.blueeyesintelligence.org
Email: director@blueeyesintelligence.org, blueeyes@gmail.com
Cell #: +91-9669981618, **WhatsApp #:** +91-9669981618, **Viber #:** +91-9669981618
Skype #: beiesp, **Twitter #:** beiesp

Editor In Chief

Dr. Shiv K Sahu
Ph.D. (CSE), M.Tech. (IT, Honors), B.Tech. (IT)
Director, Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd., Bhopal(M.P.), India

Dr. Shachi Sahu
Ph.D. (Chemistry), M.Sc. (Organic Chemistry)
Additional Director, Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd., Bhopal(M.P.), India

Vice Editor In Chief

Dr. Vahid Nourani
Professor, Faculty of Civil Engineering, University of Tabriz, Iran

Prof.(Dr.) Anuranjan Misra
Professor & Head, Computer Science & Engineering and Information Technology & Engineering, Noida International University, Noida (U.P.), India

Chief Advisory Board

Prof. (Dr.) Hamid Saremi
Vice Chancellor of Islamic Azad University of Iran, Quchan Branch, Quchan-Iran

Dr. Uma Shanker
Professor & Head, Department of Mathematics, CEC, Bilaspur(C.G.), India

Dr. Rama Shanker
Professor & Head, Department of Statistics, Eritrea Institute of Technology, Asmara, Eritrea

Dr. Vinita Kumari
Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd., India

Dr. Kapil Kumar Bansal
Head (Research and Publication), SRM University, Gaziabad (U.P.), India

Dr. Deepak Garg
Professor, Department of Computer Science and Engineering, Thapar University, Patiala (Punjab), India, Senior Member of IEEE, Secretary of IEEE Computer Society (Delhi Section), Life Member of Computer Society of India (CSI), Indian Society of Technical Education (ISTE), Indian Science Congress Association Kolkata.

Dr. Vijay Anant Athavale
Director of SVS Group of Institutions, Mawana, Meerut (U.P.) India/ U.P. Technical University, India

Dr. T.C. Manjunath
Principal & Professor, HKBK College of Engg, Nagawara, Arabic College Road, Bengaluru-560045, Karnataka, India

Dr. Kosta Yogeshwar Prasad
Director, Technical Campus, Marwadi Education Foundation's Group of Institutions, Rajkot-Morbi Highway, Gauridad, Rajkot, Gujarat, India

Dr. Dinesh Varshney
Director of College Development Counceling, Devi Ahilya University, Indore (M.P.), Professor, School of Physics, Devi Ahilya University, Indore (M.P.), and Regional Director, Madhya Pradesh Bhoj (Open) University, Indore (M.P.), India

Dr. P. Dananjayan
Professor, Department of Department of ECE, Pondicherry Engineering College, Pondicherry,India

Dr. Sadhana Vishwakarma
Associate Professor, Department of Engineering Chemistry, Technocrat Institute of Technology, Bhopal(M.P.), India

Dr. Kamal Mehta
Associate Professor, Deptment of Computer Engineering, Institute of Technology, NIRMA University, Ahmedabad (Gujarat), India

Dr. CheeFai Tan
Faculty of Mechanical Engineering, University Technical, Malaysia Melaka, Malaysia

Dr. Suresh Babu Perli
Professor & Head, Department of Electrical and Electronic Engineering, Narasaraopeta Engineering College, Guntur, A.P., India

Dr. Binod Kumar
Associate Professor, Schhool of Engineering and Computer Technology, Faculty of Integrative Sciences and Technology, Quest International University, Ipoh, Perak, Malaysia

Dr. Chiladze George
Professor, Faculty of Law, Akhaltsikhe State University, Tbilisi University, Georgia

Dr. Kavita Khare
Professor, Department of Electronics & Communication Engineering, MANIT, Bhopal (M.P.), INDIA

Dr. C. Saravanan
Associate Professor (System Manager) & Head, Computer Center, NIT, Durgapur, W.B. India

Dr. S. Saravanan
Professor, Department of Electrical and Electronics Engineering, Muthayamal Engineering College, Resipuram, Tamilnadu, India

Dr. Amit Kumar Garg
Professor & Head, Department of Electronics and Communication Engineering, Maharishi Markandeshwar University, Mulllana, Ambala (Haryana), India

Dr. T.C.Manjunath
Principal & Professor, HKBK College of Engg, Nagawara, Arabic College Road, Bengaluru-560045, Karnataka, India

Dr. P. Dananjayan
Professor, Department of Department of ECE, Pondicherry Engineering College, Pondicherry, India

Dr. Kamal K Mehta
Associate Professor, Department of Computer Engineering, Institute of Technology, NIRMA University, Ahmedabad (Gujarat), India

Dr. Rajiv Srivastava
Director, Department of Computer Science & Engineering, Sagar Institute of Research & Technology, Bhopal (M.P.), India

Dr. Chakunta Venkata Guru Rao
Professor, Department of Computer Science & Engineering, SR Engineering College, Ananthasagar, Warangal, Andhra Pradesh, India

Dr. Anuranjan Misra
Professor, Department of Computer Science & Engineering, Bhagwant Institute of Technology, NH-24, Jindal Nagar, Ghaziabad, India

Dr. Robert Brian Smith
International Development Assistance Consultant, Department of AEC Consultants Pty Ltd, AEC Consultants Pty Ltd, Macquarie Centre, North Ryde, New South Wales, Australia

Dr. Saber Mohamed Abd-Allah
Associate Professor, Department of Biochemistry, Shanghai Institute of Biochemistry and Cell Biology, Yue Yang Road, Shanghai, China

Dr. Himani Sharma
Professor & Dean, Department of Electronics & Communication Engineering, MLR Institute of Technology, Laxman Reddy Avenue, Dundigal, Hyderabad, India

Dr. Sahab Singh
Associate Professor, Department of Management Studies, Dronacharya Group of Institutions, Knowledge Park-III, Greater Noida, India

Dr. Umesh Kumar
Principal: Govt Women Poly, Ranchi, India

Dr. Syed Zaheer Hasan
Scientist-G Petroleum Research Wing, Gujarat Energy Research and Management Institute, Energy Building, Pandit Deendayal Petroleum University Campus, Raisan, Gandhinagar-382007, Gujarat, India.

Dr. Jaswant Singh Bhomrah
Director, Department of Profit Oriented Technique, 1 – B Crystal Gold, Vijalpore Road, Navsari 396445, Gujarat. India

Technical Advisory Board

Dr. Mohd. Husain
Director MG Institute of Management & Technology, Banthara, Lucknow (U.P.), India

Dr. T. Jayanthy
Principal, Panimalar Institute of Technology, Chennai (TN), India

Dr. Umesh A.S.
Director, Technocrats Institute of Technology & Science, Bhopal(M.P.), India

Dr. B. Kanagasabapathi
Infosys Labs, Infosys Limited, Center for Advance Modeling and Simulation, Infosys Labs, Infosys Limited, Electronics City, Bangalore, India

Dr. C.B. Gupta
Professor, Department of Mathematics, Birla Institute of Technology & Sciences, Pilani (Rajasthan), India

Dr. Sunandan Bhunia
Associate Professor & Head,, Dept. of Electronics & Communication Engineering, Haldia Institute of Technology, Haldia, West Bengal, India

Dr. Jaydeb Bhaumik
Associate Professor, Dept. of Electronics & Communication Engineering, Haldia Institute of Technology, Haldia, West Bengal, India

Dr. Rajesh Das
Associate Professor, School of Applied Sciences, Haldia Institute of Technology, Haldia, West Bengal, India

Dr. Mrutyunjaya Panda
Professor & Head, Department of EEE, Gandhi Institute for Technological Development, Bhubaneswar, Odisha, India

Dr. Mohd. Nazri Ismail
Associate Professor, Department of System and Networking, University of Kuala (UniKL), Kuala Lumpur, Malaysia

Dr. Haw Su Cheng
Faculty of Information Technology, Multimedia University (MMU), Jalan Multimedia, 63100 Cyberjaya

Dr. Hossein Rajabalipour Cheshmehgaz
Industrial Modeling and Computing Department, Faculty of Computer Science and Information Systems, Universiti Teknologi Malaysia (UTM) 81310, Skudai, Malaysia

Dr. Sudhinder Singh Chowhan
Associate Professor, Institute of Management and Computer Science, NIMS University, Jaipur (Rajasthan), India

Dr. Neeta Sharma
Professor & Head, Department of Communication Skils, Technocrat Institute of Technology, Bhopal(M.P.), India

Dr. Ashish Rastogi
Associate Professor, Department of CSIT, Guru Ghansi Das University, Bilaspur (C.G.), India

Dr. Santosh Kumar Nanda
Professor, Department of Computer Science and Engineering, Eastern Academy of Science and Technology (EAST), Khurda (Orisa), India

Dr. Hai Shanker Hota
Associate Professor, Department of CSIT, Guru Ghansi Das University, Bilaspur (C.G.), India

Dr. Sunil Kumar Singla
Professor, Department of Electrical and Instrumentation Engineering, Thapar University, Patiala (Punjab), India

Dr. A. K. Verma
Professor, Department of Computer Science and Engineering, Thapar University, Patiala (Punjab), India

Dr. Durgesh Mishra
Chairman, IEEE Computer Society Chapter Bombay Section, Chairman IEEE MP Subsection, Professor & Dean (R&D), Acropolis Institute of Technology, Indore (M.P.), India

Dr. Xiaoguang Yue
Associate Professor, College of Computer and Information, Southwest Forestry University, Kunming (Yunnan), China

Dr. Veronica Mc Gowan
Associate Professor, Department of Computer and Business Information Systems,Delaware Valley College, Doylestown, PA, Allman China

Dr. Mohd. Ali Hussain
Professor, Department of Computer Science and Engineering, Sri Sai Madhavi Institute of Science & Technology, Rajahmundry (A.P.), India

Dr. Mohd. Nazri Ismail
Professor, System and Networking Department, Jalan Sultan Ismail, Kaula Lumpur, MALAYSIA

Dr. Sunil Mishra
Associate Professor, Department of Communication Skills (English), Dronacharya College of Engineering, Farrukhnagar, Gurgaon (Haryana), India

Dr. Labib Francis Gergis Rofaiel
Associate Professor, Department of Digital Communications and Electronics, Misr Academy for Engineering and Technology, Mansoura City, Egypt

Dr. Pavol Tanuska
Associate Professor, Department of Applied Informetics, Automation, and Mathematics, Trnava, Slovakia

Dr. VS Giridhar Akula
Professor, Avanthi's Research & Technological Academy, Gunthapally, Hyderabad, Andhra Pradesh, India

Dr. S. Satyanarayana
Associate Professor, Department of Computer Science and Engineering, KL University, Guntur, Andhra Pradesh, India

Dr. Bhupendra Kumar Sharma
Associate Professor, Department of Mathematics, KL University, BITS, Pilani, India

Dr. Praveen Agarwal
Associate Professor & Head, Department of Mathematics, Anand International College of Engineering, Jaipur (Rajasthan), India

Dr. Manoj Kumar
Professor, Department of Mathematics, Rashtriya Kishan Post Graduate Degree, College, Shamli, Prabudh Nagar, (U.P.), India

Dr. Shaikh Abdul Hannan
Associate Professor, Department of Computer Science, Vivekanand Arts Sardar Dalipsing Arts and Science College, Aurangabad (Maharashtra), India

Dr. K.M. Pandey
Professor, Department of Mechanical Engineering,National Institute of Technology, Silchar, India

Prof. Pranav Parashar
Technical Advisor, International Journal of Soft Computing and Engineering (IJSCE), Bhopal (M.P.), India

Dr. Biswajit Chakraborty
MECON Limited, Research and Development Division (A Govt. of India Enterprise), Ranchi-834002, Jharkhand, India

Dr. D.V. Ashoka
Professor & Head, Department of Information Science & Engineering, SJB Institute of Technology, Kengeri, Bangalore, India

Dr. Sasidhar Babu Suvanam
Professor & Academic Cordinator, Department of Computer Science & Engineering, Sree Narayana Gurukulam College of Engineering, Kadayiuruppu, Kolenchery, Kerala, India

Dr. C. Venkatesh
Professor & Dean, Faculty of Engineering, EBET Group of Institutions, Kangayam, Erode, Caimbatore (Tamil Nadu), India

Dr. Nilay Khare
Assoc. Professor & Head, Department of Computer Science, MANIT, Bhopal (M.P.), India

Dr. Sandra De Iaco
Professor, Dip.to Di Scienze Dell'Economia-Sez. Matematico-Statistica, Italy

Dr. Yaduvir Singh
Associate Professor, Department of Computer Science & Engineering, Ideal Institute of Technology, Govindpuram Ghaziabad, Lucknow (U.P.), India

Dr. Angela Amphawan
Head of Optical Technology, School of Computing, School Of Computing, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia

Dr. Ashwini Kumar Arya
Associate Professor, Department of Electronics & Communication Engineering, Faculty of Engineering and Technology,Graphic Era University, Dehradun (U.K.), India

Dr. Yash Pal Singh
Professor, Department of Electronics & Communication Engg, Director, KLS Institute Of Engg.& Technology, Director, KLSIET, Chandok, Bijnor, (U.P.), India

Dr. Ashish Jain
Associate Professor, Department of Computer Science & Engineering, Accurate Institute of Management & Technology, Gr. Noida (U.P.), India

Dr. Abhay Saxena
Associate Professor & Head, Department of Computer Science, Dev Sanskriti University, Haridwar, Uttrakhand, India

Dr. Judy. M.V
Associate Professor, Head of the Department CS &IT, Amrita School of Arts and Sciences, Amrita Vishwa Vidyapeetham, Brahmasthanam, Edapally, Cochin, Kerala, India

Dr. Sangkyun Kim
Professor, Department of Industrial Engineering, Kangwon National University, Hyoja 2 dong, Chunche0nsi, Gangwondo, Korea

Dr. Sanjay M. Gulhane
Professor, Department of Electronics & Telecommunication Engineering, Jawaharlal Darda Institute of Engineering & Technology, Yavatmal, Maharastra, India

Dr. K.K. Thyagharajan
Principal & Professor, Department of Informational Technology, RMK College of Engineering & Technology, RSM Nagar, Thiruyallur, Tamil Nadu, India

Dr. P. Subashini
Assoc. Professor, Department of Computer Science, Coimbatore, India

Dr. G. Srinivasrao
Professor, Department of Mechanical Engineering, RVR & JC, College of Engineering, Chowdavaram, Guntur, India

Dr. Rajesh Verma
Professor, Department of Computer Science & Engg. and Deptt. of Information Technology, Kurukshetra Institute of Technology & Management, Bhor Sadian, Pehowa, Kurukshetra (Haryana), India

Dr. Pawan Kumar Shukla
Associate Professor, Satya College of Engineering & Technology, Haryana, India

Dr. U C Srivastava
Associate Professor, Department of Applied Physics, Amity Institute of Applied Sciences, Amity University, Noida, India

Dr. Reena Dadhich
Prof. & Head, Department of Computer Science and Informatics, MBS MArg, Near Kabir Circle, University of Kota, Rajasthan, India

Dr. Aashis. S. Roy
Department of Materials Engineering, Indian Institute of Science, Bangalore Karnataka, India

Dr. Sudhir Nigam
Professor Department of Civil Engineering, Principal, Lakshmi Narain College of Technology and Science, Raisen, Road, Bhopal, (M.P.), India

Dr. S. Senthil Kumar
Doctorate, Department of Center for Advanced Image and Information Technology, Division of Computer Science and Engineering, Graduate School of Electronics and Information Engineering, Chon Buk National University Deok Jin-Dong, Jeonju, Chon Buk, 561-756, South Korea Tamilnadu, India

Dr. Gufran Ahmad Ansari
Associate Professor, Department of Information Technology, College of Computer, Qassim University, Al-Qassim, Kingdom of Saudi Arabia (KSA)

Dr. R. Navaneetha krishnan
Associate Professor, Department of MCA, Bharathiyar College of Engg & Tech, Karaikal Puducherry, India

Dr. Hossein Rajabalipour Cheshmejgaz
Industrial Modeling and Computing Department, Faculty of Computer Science and Information Systems, Universiti Teknologi Skudai, Malaysia

Dr. Veronica McGowan
Associate Professor, Department of Computer and Business Information Systems, Delaware Valley College, Doylestown, PA, Allman China

Dr. Sanjay Sharma
Associate Professor, Department of Mathematics, Bhilai Institute of Technology, Durg, Chhattisgarh, India

Dr. Taghreed Hashim Al-Noor
Professor, Department of Chemistry, Ibn-Al-Haitham Education for pure Science College, University of Baghdad, Iraq

Dr. Madhumita Dash
Professor, Department of Electronics & Telecommunication, Orissa Engineering College , Bhubaneswar,Odisha, India

Dr. Anita Sagadevan Ethiraj
Associate Professor, Department of Centre for Nanotechnology Research (CNR), School of Electronics Engineering (Sense), Vellore Institute of Technology (VIT) University, Tamilnadu, India

Dr. Sibasis Acharya
Project Consultant, Department of Metallurgy & Mineral Processing, Midas Tech International, 30 Mukin Street, Jindalee-4074, Queensland, Australia

Dr. Neelam Ruhil
Professor, Department of Electronics & Computer Engineering, Dronacharya College of Engineering, Gurgaon, Haryana, India

Dr. Faizullah Mahar
Professor, Department of Electrical Engineering, Balochistan University of Engineering and Technology, Pakistan

Dr. K. Selvaraju
Head, PG & Research, Department of Physics, Kandaswami Kandars College (Govt. Aided), Velur (PO), Namakkal DT. Tamil Nadu, India

Dr. M. K. Bhanarkar
Associate Professor, Department of Electronics, Shivaji University, Kolhapur, Maharashtra, India

Dr. Sanjay Hari Sawant
Professor, Department of Mechanical Engineering, Dr. J. J. Magdum College of Engineering, Jaysingpur, India

Dr. Arindam Ghosal
Professor, Department of Mechanical Engineering, Dronacharya Group of Institutions, B-27, Part-III, Knowledge Park,Greater Noida, India

Dr. M. Chithirai Pon Selvan
Associate Professor, Department of Mechanical Engineering, School of Engineering & Information Technology Manipal University, Dubai, UAE

Dr. S. Sambhu Prasad
Professor & Principal, Department of Mechanical Engineering, Pragati College of Engineering, Andhra Pradesh, India.

Dr. Muhammad Attique Khan Shahid
Professor of Physics & Chairman, Department of Physics, Advisor (SAAP) at Government Post Graduate College of Science, Faisalabad.

Dr. Kuldeep Pareta
Professor & Head, Department of Remote Sensing/GIS & NRM, B-30 Kailash Colony, New Delhi 110 048, India

Dr. Th. Kiranbala Devi
Associate Professor, Department of Civil Engineering, Manipur Institute of Technology, Takyelpat, Imphal, Manipur, India

Dr. Nirmala Mungamuru
Associate Professor, Department of Computing, School of Engineering, Adama Science and Technology University, Ethiopia

Dr. Srilalitha Girija Kumari Sagi
Associate Professor, Department of Management, Gandhi Institute of Technology and Management, India

Dr. Vishnu Narayan Mishra
Associate Professor, Department of Mathematics, Sardar Vallabhbhai National Institute of Technology, Ichchhanath Mahadev Dumas Road, Surat (Gujarat), India

Dr. Yash Pal Singh
Director/Principal, Somany (P.G.) Institute of Technology & Management, Garhi Bolni Road , Rewari Haryana, India.

Dr. Sripada Rama Sree
Vice Principal, Associate Professor, Department of Computer Science and Engineering, Aditya Engineering College, Surampalem, Andhra Pradesh. India.

Dr. Rustom Mamlook
Associate Professor, Department of Electrical and Computer Engineering, Dhofar University, Salalah, Oman. Middle East.

Managing Editor

Mr. Jitendra Kumar Sen
International Journal of Innovative Technology and Exploring Engineering (IJITEE)

Editorial Board

Dr. Saeed Balochian
Associate Professor, Gonaabad Branch, Islamic Azad University, Gonabad, Iratan

Dr. Mongey Ram
Associate Professor, Department of Mathematics, Graphics Era University, Dehradun, India

Dr. Arupratan Santra
Sr. Project Manager, Infosys Technologies Ltd, Hyderabad (A.P.)-500005, India

Dr. Ashish Jolly
Dean, Department of Computer Applications, Guru Nanak Khalsa Institute & Management Studies, Yamuna Nagar (Haryana), India

Dr. Israel Gonzalez Carrasco
Associate Professor, Department of Computer Science, Universidad Carlos III de Madrid, Leganes, Madrid, Spain

Dr. Guoxiang Liu
Member of IEEE, University of North Dakota, Grand Froks, N.D., USA

Dr. Khushali Menaria
Associate Professor, Department of Bio-Informatics, Maulana Azad National Institute of Technology (MANIT), Bhopal (M.P.), India

Dr. R. Sukumar
Professor, Sethu Institute of Technology, Pulloor, Kariapatti, Virudhunagar, Tamilnadu, India

Dr. Cherouat Abel
Professor, University of Technology of Troyes, France

Dr. Rinkle Aggrawal
Associate Professor, Department of Computer Science and Engineering, Thapar University, Patiala (Punjab), India

Dr. Parteek Bhatia
Associate Professor, Deprtment of Computer Science & Engineering, Thapar University, Patiala (Punjab), India

Dr. Manish Srivastava
Professor & Head, Computer Science and Engineering, Guru Ghasidas Central University, Bilaspur (C.G.), India

Dr. B. P. Ladgaonkar
Assoc. Professor&Head, Department of Electronics, Shankarrao Mohite Mahavidyalaya, Akluj, Maharashtra, India

Dr. E. Mohan
Professor & Head, Department of Computer Science and Engineering, Pallavan College of Engineering, Kanchipuram, Tamilnadu, India

Dr. M. Shanmuga Ptriya
Assoc. Professor, Department of Biotechnology, MVJ College of Engineering, Bangalore Karnataka, India

Dr. Leena Jain
Assoc. Professor & Head, Dept. of Computer Applications, Global Institute of Management & Emerging Technologies, Amritsar, India

Dr. S.S.S.V Gopala Raju
Professor, Department of Civil Engineering, GITAM School of Technology, GITAM, University, Hyderabad, Andhra Pradesh, India

Dr. Ani Grubisic
Department of Computer Science, Teslina 12, 21000 split, Croatia

Dr. Ashish Paul
Associate Professor, Department of Basic Sciences (Mathematics), Assam Don Bosco University, Guwahati, India

Dr. Sivakumar Durairaj
Professor, Department of Civil Engineering, Vel Tech High Tech Dr.Rangarajan Dr.Sakunthala Engineering College, Avadi, Chennai Tamil Nadu, India

Dr. Rashmi Nigam
Associate Professor, Department of Applied Mathematics, UTI, RGPV, Airport Road, Bhopal, (M.P.), India

Dr. Mu-Song Chen
Associate Professor, Department of Electrical Engineering, Da-Yeh University, Rd., Dacun, Changhua 51591, Taiwan R.O.C., Taiwan, Republic of China

Dr. Ramesh S
Associate Professor, Department of Electronics & Communication Engineering, Dr. Ambedkar Institute of Technology, Bangalore, India

Dr. Nor Hayati Abdul Hamid
Associate Professor, Department of Civil Engineering, Universiti Teknologi Mara, Selangor, Malaysia

Dr. C.Nagarajan
Professor & Head, Department of Electrical & Electronic Engineering Muthayammal Engineering College,Rasipuram,Tamilnadu, India

Dr. Ilaria Cacciotti
Department of Industrial Engineering, University of Rome Tor Vergata Via del Politecnico Rome-Italy

Dr. V.Balaji
Principal Cum Professor, Department of EEE &E&I, Lord Ayyappa Institute of Engg & Tech,Uthukadu, Walajabad, Kanchipuram, Tamil Nadu, India

Dr. G. Anjan Babu
Assoc. Professor, Department of Computer Science, S V University, Tirupati, Andhra Pradesh, India

Dr. Damodar Reddy Edla
Assoc. Professor, Department of Computer Science & Engineering, National Institute of Technology, Goa, India

Dr. D.Arumuga Perumal
Professor, Department of Mechanical Engg, Noorul Islam University, Kanyakumari (Dist), Tamilnadu, India

Dr. Roshdy A. AbdelRassoul
Professor, Department of Electronics and Communications Engineering, Arab Academy for Science and Technology, Electronics and Communications Engineering Dept., POBox 1029, Abu-Qir, Alexandria, Egypt

Dr. Aniruddha Bhattacharya
Assoc. Professor & Head, Department of Computer Science & Engineering, Amrita School of Engineering, Bangalore, India

Dr. P Venkateswara Rao
Professor, Department of Mechanical Engineering, KITS, Warangal, Andhra Pradesh, India

Dr. V.Mahalakshmi M.L
Assoc. Professor & Head, Institute of Management Studies, Chennai CID Quarters, V.K.Iyer Road, Mandaveli, Chennai

1.

Authors: Chrysanthi Argiropoulou, Kosmas-Aristotelis Doucas

Paper Title: The Effect of the Canopy of Scots Pines (P. Sylvestris) in Positioning Accuracy Utilizing the Network of Permanent GPS Reference Stations of the Hellenic Positioning System (HEPOS)

Abstract: The creation of Permanent Reference Stations and the implementation of network positioning techniques can significantly improve the positioning accuracy in forested conditions. The Hellenic Positioning System (HEPOS) is the first Network of Permanent GPS Reference Stations in Greece. The aim of the paper is to test the positioning accuracy within a conifer forest of Scots pines (Pinus sylvestris) using HEPOS system and an implementation of four Real Time (RTK) GPS techniques: the Virtual Reference Stations (VRS), the Master-Auxiliary Concept (MAC) technique, the Single-Base technique and the Network-based DGPS technique. In the study area, pines with normal growth and pines with stunted growth and bushy appearance were found. So three measurement testing courses were established: first under closed canopy of isolated pines with busy appearance, second above canopy of isolated pines with busy appearance (open sky) and finally under closed canopy of pines with normal growth, that are forest cluster with high canopy density. The results were obtained by comparing the measurements of points as recorded by the GPS receiver Leica GS09 GNSS with the measurements of points as recorded by the total station Leica TCR 407, whose measurements are taken as ¨true values¨. The measurements were carried out in the national forest of Lailia, Serres, Macedonia, Northern Greece.

Keywords: Permanent reference station, VRS, MAC, Single Base, Network DGPS.

References:

1. Ahmed El-Rabbany, 2002. Introduction to GPS, the Global Positioning System, Artech House.
2. Argiropoulou Chrysanthi, K-A Doucas, V. Drosos, V. Giannoulas, 2012. Evaluation of reliability of HEllenic POsitioning System (HEPOS) in forest and forest lands (area). In 45th International Symposium on Forestry Mechanization, FORMEC 2012, Dubrovnik, Croatia 2012.
3. Brian H. Holley and Michael D. Yawn. Accuracies of various gps antennas under forested conditions, Proceedings of the 5th Southern Forestry and Natural Resources GIS Conference, Asheville, North Carolina, June 12-14, 2006.
4. Burlet, E., 2001. Global Positioning System. Grundlagen und Anwendungsmöglichkeiten im Forstwesen. Lecture Notes, ETH Zürich. pp 6, 8, 9/39.
5. Darche, M.H., 1998. A Comparison of Four New GPS Systems under Forestry Conditions. Forest Engineering Institute of Canada Special Report 128, Pointe Claire, Quebec, Canada. 16 p.
6. Delicaraoglou D. (2006). "Prospects from the network infrastructure of HEPOS for the transmission of spatial information via Web service and radio mobile modem", 9o national conference of cartography, Chania, Greece, 2006.
7. Gianniou M. (2008a). "HEPOS and modern network GPS techniques", Two days conference: "HEPOS and modern geodetic reference systems: Theory and implementation, prospects and applications", Aristotle University of Thessaloniki, Thessaloniki, Greece, 2008.
8. Gianniou M. (2008b). "HEPOS: Modern network-based GPS surveying", www. hepos.gr, (accessed January 06, 2012).
9. Gianniou, M. and Mastoris, D., (2006). Development of the Greek positioning system HEPOS. In fourth panhellenic conference HellasGIS, Athens, Greece, 2006.
10. Hofmann – Wellenhof. B. & Lichtenegger, H. & Wasle, E., 2008. GNSS: Global Navigation Satellite Systems – GPS, GLONASS, Galileo, and More. Springer, 516 p.
11. Holden, N.M. & Martin, A.A. & Owende P.M.O. & Ward, S.M., 2001. A Method For Relating GPS Performance To Forest Canopy, International Journal Of Forest Engineering, Vol. 12, no. 2: 7-12 pp.
12. Karsky, D., Chamberlain, K., Mancebo, S., Patterson, D. and Jasumback, T., 2000. Comparison of GPS Receivers under a Forest Canopy with Selective Availability Off. USDA Forest Service Project Report 7100. 21 p.
13. Ktimatologio SA (2007). Technical training requirements of forest maps, Athens, Greece, 2007.
14. Liu, C.J., and Brantigan, R., 1996. Using differential GPS for forest traverse surveys. Canadian Journal of Forestry Research 25, 1795-1805.
15. Mancebo, S., and K. Chamberlain, 2001. Performance Testing of the Trimble Pathfinder Pro XR Global Positioning System Receiver. USDA Forest Service Technical Note. l0p.
16. Mikhail, E. M. and Gracie, G. (1981). Analysis and Adjustment of Survey Measurements. Van Nostrand Reinhold Company, New York: 340 pp.
17. Piedallu, C. and Gégout, J.-C., 2005. Effects of Forest Environment and Survey Protocol on GPS Accuracy, Photogrammetric Engineering & Remote Sensing Vol. 71, No. 9, September 2005, pp. 1071–1078.
18. Pirti A., 2008. Accuracy Analysis of GPS Positioning Near the Forest Environment. Croatian Journal of Forest Engineering, 29(2): 189–201.
19. Rodríguez-Pérez, J., Álvarez, R., Flor, M., Sanz, E. and Gavela, A. (2006). Comparison of GPS Receiver Accuracy and Precision in Forest Environments. Practical Recommendations Regarding Methods and Receiver Selection. In XXIII FIG Congress, Shaping the Change, Munich, Germany, 2006.
20. Scott D. Danskin and Pete Bettinger, Thomas R. Jordan, 2006. Assessing gps accuracy, waas, and a choke ring antenna solution in a southern hardwood forest, Proceedings of the 5th Southern Forestry and Natural Resources GIS Conference, Asheville, North Carolina, June 12-14, 2006.
21. Sigrist, P. & Coppin, P. & Hermy. M., 1999. Impact of forest canopy on quality and accuracy of GPS measurements. International Journal of Remote Sensing, vol. 20, issue (18), pp: 3595–3610.
22. Stjernberg, E., 1997. A Test of GPS Receivers in Old-growth Forest Stands on the Queen Charlotte Islands. Forest Engineering Institute of Canada Special Report 125, Vancouver, BC, Canada. 26 p.
23. Wing, Michael G., Eklund, Aaron, Kellogg, Loren D., 2005. Consumer-Grade Global Positioning System (GPS) Accuracy and Reliability. Journal of Forestry, Volume 103, Number 4, June 2005, pp. 169-173(5), Publisher: Society of American Foresters.
24. www.hepos.gr, accessed December 27, 2013.

1-8

2.

Authors: Chrysanthi Argiropoulou, Kosmas-Aristotelis Doucas

Paper Title: An Improved Hadamard-Coiflets Transform for Image Compression with Arithmetic Coding

Abstract: Recently the growths of the digital imaging applications have increased the need of various image compression techniques. To remove the redundant information from the image the image compression is used. With the help of image compression we can store the essential information of the image so that the storage size, the time

9-12

and bandwidth of transmission get reduce. Recently the research on image compression techniques inspired us to propose Hadamard-Coiflets transform with arithmetic coding to increase the visual quality of image. The improved Hadamard-Coiflets transform with arithmetic coding is good techniques of compression and can able to give higher PSNR value as compared to various existing methods. Here the Hadamard-Coiflets transform is applice first and then on each block of the low frequency subband and split all values from each transformed block followed by applying arithmetic coding for image compression.

Keywords: Image Compression, Hadamard-Coiflets Transform and Arithmetic Coding.

References:

1. M.A. Losada, G. Tohumouglu, D. Fraile and A. Artes, "Multi-iteration wavelet zerotree coding for image compression", Sci. Signal Process., vol. 80 pp. 1281-1287, 2000.
2. N. Jayant, J. Johnston and R. Safranek, "Signal compression based on models of human perception", Proc. IEEE, vol. 81, no. 10, pp. 1385-1422, Oct. 1993.
3. Skodras, C. Christopoulos, and T. Ebrahimi, "The JPEG2000 still image compression standard," IEEE Signal Process. Mag., vol. 18, pp. 36–58, Sep. 2001.
4. MPEG-2video, ITU-T-Recommendation H.262-ISO/IEC 13818-2, Jan. 1995.
5. Ronald A. DeVore, Bjorn Jawerth and Bradley J. Lucier, "Image Compression Through Wavelet Transform Coding", IEEE Transactions on Information Theory, Vol. 38. No. 2, March 1992.
6. D. Taubman, E. Ordentlich, M.Weinberger, G. Seroussi, I. Ueno, and F. Ono, "Embedded block coding in JPEG2000," in Proc. Int. Conf. Image Processing, vol. 2, 2000, pp. 33–36.
7. J. M. Shapiro, "Embedded image coding using zerotrees of wavelet coefficients," IEEE Trans. Signal Process., vol. 41, no. 12, pp. 3445–3462, Dec. 1993.
8. S. Servetto, K. Ramchandran, and M. Orchard, "Image coding based on a morphological representation of wavelet data," IEEE Trans. Image Processing, vol. 8, pp. 1161–1173, Sept. 1999.
9. Criminisi, P. Pérez, and K. Toyama, "Region filling and object removal by exemplar-based image inpainting," IEEE Trans. Image Process., vol. 13, no. 9, pp. 1200–1212, Sep. 2004.
10. D. Alani, A. Averbuch, and S. Dekel, "Image coding with geometric wavelets," IEEE Trans. Image Process., vol. 16, no. 1, pp. 69–77, Jan. 2007.
11. Said and W. A. Pearlman, "A new, fast and efficient image codec based on set portioning in hierarchical trees," IEEE Trans. Circuits Syst. Video Technol., vol. 6, no. 3, pp. 243–250, Jun. 1996.
12. Marc Antonini, Michel Barlaud, Member, Pierre Mathieu, and Ingrid Daubechies, "Image Coding Using Wavelet Transform", IEEE Transactions on Image Processing, Vol. I , No 2. April 1992.
13. Iren Valova and Yukio Kosugi, "Hadamard-Based Image Decomposition and Compression", IEEE Transactions on Information Technology in Biomedicine, Vol. 4, No. 4, December 2000.1
14. Sonja Grgic, Mislav Grgic and Branka Zovko-Cihlar, "Performance Analysis of Image Compression Using Wavelets", IEEE Transactions On Industrial Electronics, Vol. 48, No. 3, June 2001.
15. Arthur Petrosian, "New Classes of Hybrid Hadamard-Wavelet Transforms for Signal-Image Processing", Proceeaings of the Second Jam EMES BMES Conference Houston TX. JSA - Oclooer 23-26, 2002.
16. Sunil Malviya ,Neelesh Gupta and Vibhanshu Shirvastava, " 2D-Discrete Walsh Wavelet Transform for Image Compression with Arithmetic Coding", 4th ICCCNT-2013.
17. Dong Liu, Xiaoyan Sun, Feng Wu, Shipeng Li and Ya-Qin Zhang,"Image Compression With Edge-Based Inpainting", IEEE Transactions on Circuits and Systems for Video Technology, Vol. 17, No. 10, October 2007.

3.

Authors:	**V. Balaji, L. Rajaji**
Paper Title:	**ARX-Model based Model Predictive Control of a pH Process using LabVIEW**

Abstract: ARX models, is a suitable model for linear control implementations. The parameter estimation problem is convex and easily handed for both SISO and MIMO system. This paper deals with a novel formulation of ARX Model –Predictive control for the pH Process in a Continuous Stirrer Tank Reactor(CSTR).An illustrative simulation is conducted to compare the proposed model based controller with the conventional Proportional – Integral – Derivative(PID) controller for the pH purification process. The simulation results confirm that MPC is one of the best possibilities for successful control for pH process.

Keywords: pH Purification, Model Predictive Control, PID controller, CSTR, LabVIEW

References:

1. James B. Rawlings, "Model Predictive ControlTechnology" Proceedings of the American ControlConference San Diego, California June 1999.
2. S. J. Qin and T. A. Badgwell, "A survey of industrialmodel predictive control technology," Control Engineering Practice, vol. 11, pp.733–764, 2003.
3. Henson, M. A., "Nonlinear Model Predictive Control: current status and future directions" Computers and Chemical Engineering, 1998.
4. Clarke, D., Mohtadi, C. and Tuffs, P.S. (1987). Generalized predictive control – part i. the basic algorithm. Automatica 23(2), 137-148.
5. J.M. Maciejowski: Predictive control with constraints. Prentice-Hall,Pearson Education Limited, Harlow, UK, 2002.
6. Camacho, E. F., "Model Predictive Control", Springer Verlag, 2004.
7. S.J. Qin, T.A. Badgwell, An overview of industrial model predictive control technology, in Chemical Process Control, Tahoe City, 1996, pp.232-256.
8. LabVIEW (2014) System Identification Toolkit User Manual. National Instruments
9. K. Valarmathi, D. Devaraj and T. K. Radhakrishnan.Intelligent techniques for system Identification ancontroller Tuning in ph process. Brazilian Journal of Chemical Engineering Vol. 26, No. 01, pp. 99 – 111 January - March, 2009.
10. Radhakrishnan V.R. and S.W. Wah, Wiener Type Model for pH Neutralization Process,Proceedings of RSCE2002 and 16th SOMChE, (2002), Malaysia.

13-16

4.

Authors:	**P. Radha, B. Srinivasan**
Paper Title:	**Hybrid Artificial Bee Colony Algorithm and Semi Supervised Learning Prediction Model for the Risk of Cardiovascular Disease in Type-2 Diabetic Patients**

Abstract: Cardiovascular disease (CVD) factor is one of the important causes of mortality among diabetes patients. Statistics shows that more than 22% of people with type 2 diabetes mellitus suffer from CVD and which in turn leads to cardiovascular disease. But still some of the works doesn't mainly focus on the semisupervised learning methods

17-24

with feature selection methods to enhance the prediction accuracy of the classification methods. The aim of this research was to identify significant CVD factors influencing type 2 diabetes controls to improve prediction accuracy. In proposed methods the preprocessing and dimensionality reduction of the patients records is done by using Kullback Leiber Divergence(KLD) –Principal component analysis (PCA) ,then attribute values measurement is completed by using kernel density estimation (KDE) which measures the attributes values based on probability mass function with Gaussian kernel function, feature selection is performed by using artificial bee colony with differential evolution (ABC-DE). Hybrid prediction model Improved Fuzzy C Means (IFCM) clustering algorithm aimed at validating chosen class label of given data and subsequently applying semisupervised Modified Self-Organizing Feature Map Neural Network (MSOFMNN) classification algorithm to the result set. The proposed method examines the behavioral factors that contribute to CVD risk factors among those with type 2 diabetes (T2D) with higher prediction accuracy, less error rate.

Keywords: Artificial bee colony (ABC), Classification, Hybrid Prediction Model, Kernel density estimation (KDE), Modified Self-Organizing Feature Map Neural Network (MSOFMNN).

References:

1. Sarwar N, Gao P, Seshasai SR, et al, "Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies", Emerging Risk Factors Collaboration, vol.375,no.9733, pp.2215-22,2010.
2. Rydén, L, Standl, E, Bartnik, M, Van den Berghe, G, Betteridge, J, De Boer, MJ & Wood, D. (2007). Task Force on Diabetes and Cardiovascular Diseases of the European Society of Cardiology (ESC); European Association for the Study of Diabetes (EASD). Guidelines on diabetes, pre-diabetes, and cardiovascular diseases: executive summary: The Task Force on Diabetes and Cardiovascular Diseases of the European Society of Cardiology (ESC) and of the European Association for the Study of Diabetes (EASD). European Heart Journal, vol.28, no.1, pp. 88-136.
3. National Collaborating Centre for Chronic Conditions. Type 2 Diabetes National Clinical Guideline for Management in Primary and Secondary Care (update), 2011.
4. Chamnan P, Simmons RK, Sharp SJ, et al, "Cardiovascular risk assessment scores for people with diabetes: a systematic review", Diabetologia vol. 52, no.10, pp.2001-14, 2009.
5. Pellegrini E, Maurantonio M, Giannico IM, et al. "Risk for cardiovascular events in an Italian population of patients with type 2 diabetes", Nutrition, Metabolism and Cardiovascular Diseases,vol.21,no.11, pp.885-92,2011.
6. Acharya, UR, Tan, PH, Subramaniam, T, Tamura, T, Chua, KC, Goh, SC, et al, "Automated identification of diabetic type 2 subjects with and without neuropathy using wavelet transform on pedobarograph", Journal of Medical Systems, vol.32,no.1,pp. 21–29,2008.
7. Chapelle ,O, Scholkopf, B & Zien. A, "Semi-Supervised Learning", vol. 2. Cambridge, MA, USA: MIT press, 2006.
8. X. Zhu, "Semi-supervised learning literature survey," Department of Computer Science University of Wisconsin, Madison, WI, USA, Technical Report 1530, 2007.
9. Gaede P, Vedel P, Larsen N, Jensen GV, Parving HH, Pedersen O , "Multifactorial intervention and cardiovascular disease in patients with type 2 diabetes", New England Journal of Medicine, ,vol.348, no.5, pp.383–393,2003.
10. Gaede P, Lund-Andersen H, Parving HH, Pedersen O , " Effect of a multifactorial intervention on mortality in type 2 diabetes", New England Journal of Medicine, Med ,vol.358,no.6 ,pp.580–591,2008 .
11. Nissen, SE, & Wolski, K , " Effect of rosiglitazone on the risk of myocardial infarction and death from cardiovascular causes", New England Journal of Medicine, vol.356,no.24, pp.2457-2471,2007.
12. George Dimitoglou, Adams, JA, Carol MJ, "Comparison of the C4.5 and a Naive Bayes Classifier for the Prediction of Lung Cancer Survivability", Journal of Computing, vol. 4, no.8, 2012.
13. Rish I, Hellerstein, J, Thathachar, J, " An analysis of data characteristics that affect Naive Bayes performance", New York. IBM Technical Report; 2002. http://www.research.ibm.com/ PM/icml01.pdf (2007).
14. Hall M, "Correlation-based feature selection for machine learning", PhD thesis. Hamilton, New Zealand: Department of Computer Science, University of Waikato; 1999. http:// www.cs.waikato.ac.nz/_mhall/thesis.pdf (2007).
15. Su CT, Yang CH, Hsu KH, Chiu WK, "Data mining for the diagnosis for type II diabetes from three-dimensional body surface anthropometrical scanning data", Computers & Mathematics with Applications ,vol.51,no.1, pp.1075—92, 2006.
16. Yu, L, & Liu, H (2003), " Feature selection for high-dimensional data: A fast correlation-based filter solution", In Proceedings of the 20th international conference on machine learning, pp. 856–863.
17. Dalakleidi, KV, Zarkogianni, K, Karamanos, VG , Thanopoulou, AC & Nikita, KS, "A hybrid genetic algorithm for the selection of the critical features for risk prediction of cardiovascular complications in Type 2 Diabetes patients", IEEE 13th International Conference on Bioinformatics and Bioengineering (BIBE), pp.1 – 4,2013.
18. Huda, Shamsul, et al, "Exploring novel features and decision rules to identify cardiovascular autonomic neuropathy using a hybrid of wrapper-filter based feature selection" , Sixth IEEE International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), pp. 297-302, 2010.
19. Myatt, GJ, "Making sense of data a practical guide to exploratory data analysis and data mining", New Jersey: John Wiley & Sons, 2007.
20. Han, J & Kamber, M, "Data mining: Concepts and techniques", 2nd edition, Morgan Kaufmann Publishers, 2006.
21. Suguna, N & Thanushkodi, KG, "An Independent Rough Set Approach Hybrid with Artificial Bee Colony Algorithm for Dimensionality Reduction", American Journal of Applied Sciences, vol.8, no.3, pp. 261 – 266, 2011.
22. Bao, L & Zeng, Jc, "Comparison and Analysis of the Selection Mechanism in the Artificial Bee Colony Algorithm", Proceedings of IEEE 9th International Conference on Hybrid Intelligent Systems, pp.411-416, 2009.
23. Patra, S, Ghosh, S , Ghosh,A , " Change detection of remote sensing images with semi-supervised multilayer perceptron" , Fundamenta Informaticae ,vol.84 ,pp.429–442,2008.
24. Chawla, NV, Bowyer, KW, Hall, LO & Kegelmeyer, WP , "SMOTE: Synthetic minority over-sampling technique", Journal of Artificial Intelligence Research (JAIR), vol.16, pp.321–357,2002.

5.

Authors: **B. Shankar**

Paper Title: **Innovative Approaches to Cost Effective Housing: A Case Study of Kudremala Slum, Mysore**

Abstract: In developing countries like India, the number of slums and squatter settlements are increasing particularly in large cities. Mysore City one of the large cities in India and there are large number of slums and squatter settlements. Kudremala slum is one of the squatter settlements and the housing and development of infrastructure was not addressed by the Karnataka Slum Clearance and Improvement Board due to its land tenure problem for quite a long time. Kudremla had 120 households when the project was initiated. The innovative housing project was initiated by the local community jointly with the Non-government organisation by mobilising funds from international funding agency SELVIP and government agencies. The paper presents the processes of innovative approaches to cost effective housing in Kudremala slum through partnership of CBO and NGO, resource mobilisation efforts and use of cost effective technology including the self-help techniques in promoting housing and

development of infrastructure.

Keywords: Community Based Organisation, Self-help Housing, Nongovernmental Organisation, Land Tenure, Cost-effective Technology.

References:

1. Shankar B., "Inclusive Urban Planning: Challenges and Strategies of Karnataka State", Poster Paper, IDES_CPS, Civil Engineering Series-Advances in Civil Engineering ACE, Ed., pp-11-15, 2011, New York.
2. Shankar B and Chidambara Swamy, " Urban Poverty Alleviation: Experiences of Community Development Initiatives in Karnataka", International Journal of Recent Trends in Engineering, Vol.1, No.6 , Academy Publishers, Finland May 2009
3. M.S Shivashanmughan and Istiyak Ahmed : "Role of NGOs in the Shelter Process of Low-income people with Special Emphasis on Housing Finance", Research Report No. 10 IHSP, HUDCO, New Delhi.
4. Dr. Shankar . B (1998), Housing through NGOs and CBOs – A Case Study of Kudremala Slum, Administrative Training Institute, Mysore.
5. Monendez, Aurelio (1993): "Access to Basic Infrastructure by the Urban Poor", Economic Development Institute of the World Bank, The World Bank, Washington D.C.
6. UNCHS, Shelter for the Homeless: the role of Non-government Organizations, Kenya.
7. Government of India, National Building Organization, 1996 and National Report, Habitat II 1996.
8. Government of Karnataka, Comprehensive Housing Policy of Karnataka, Housing Department, Bangalore.

6.

Authors:	**S. F. Syed Vasiyullah, M. Gopalakrishnan**
Paper Title:	**Profit based Unit Commitment using Improved Pre- Prepared Demand (IPPD) Table and Memory Management Algorithm (MMA)**

Abstract: In this paper, Improved Pre-prepared Power Demand (IPPD) table and Memory management algorithm is used to solve Profit Based Unit Commitment (PBUC) problem. In conventional market, Unit commitment (UC) is the process of determining the On/Off status of the generating unit to meet forecasted load by satisfying certain operating constraints that minimize the operating cost. In restructured power market, unit commitment involves commitment of generating unit of an Individual Generation company (GENCO) for maximization of his profit rather than satisfying the power demand of its consumer. In this proposed method, PBUC problem is solved in two steps. In first step unit commitment scheduling is done by IPPD table and then the problem of fuel cost and revenue function is done by Memory Management Algorithm. The IPPD table gives the information of committed unit for any predicted power demand and information about forecasted price to reduce complexity in the problem during calculation. Memory management algorithm uses Best fit and Worst bit allocation for scheduling the generator in order to receive maximum profit by considering power and reserve generation. This approach has been tested on a 3 unit system using MATLAB and the simulation result is compared with the result of previous published method obtained by other optimizing technique.

Keywords: Deregulation Improved Pre-Prepared Power demand (IPPD) table, Generation Company (GENCO), Memory Management Algorithm (MMA), and Profit Based Unit Commitment (PBUC).

References:

1. A.J. Wood, B.F. Wallenberg, Power Generation Operation and Control, second ed., Wiley, New York, 1996.
2. Charles W. Ritcher, Gerald B. Sheble, "A Profit based unit commitment GA for the competitive environment," IEEE transactions on power systems, Vol 15,No.2 ,May 2000
3. Pathom Attaviriyanupap, Hiroyuki kita, Jun Hasegawa "A Hybrid LR-EP for solving new profit based UC problem under competitive environment", IEEE Transactions on power systems, Vol.18, No.1, February 2003
4. P. Attaviriyanupap, H. Kita, E. Tanaka, J. Hasegawa, A hybrid LR-EP for solving new profit-based UC problem under competitive environment, IEEE Transactions on Power Systems 18 (2003) 229–237.
5. Pokharel ,B.K Shrestha ,G.B Lie,and Fleten, "profit based unit commitment for Gencos in deregulated electricity market"Proceeding of the IEEE power engineering Society general meeting ,2005
6. Y. Yamin, Q. EI-Dwairi, S.M. Shahidehpour, A new approach for GENCOs profit based unit commitment in day-ahead competitive electricity markets considering reserve uncertainty, IEEE Transactions on Power Systems 29 (2007)
7. K. Chandram, N. Subrahmanyam, New approach with Muller method for profit based unit commitment, in: Proceedings of IEEE Power Systems, 2008, pp. 1–8.
8. K.Chandram, N. Subrahmanyam and M.Sydulu 'Improved Pre-prepared power demand table and Mullers method to solve the profit based unit commitment problem'. Journal of electrical engineering and technology. Vol .4.No.2 .2009.
9. B.Rampriya and K.Mahadevan 'Scheduling the units and Maximizing the profit of Gencos using LR-PSO technique' .International Journal on electrical engineering and informatics .Vol.2. No.2 .2010.
10. K.Rajangam, V.P.Arunachalam and R.Subramanian
11. 'Profit based unit commitment with forecasted power demand table' European journal of scientific research .Vol.77.No.2 2012.
12. C.Christopher Columbus , Sishaj Simon "A Profit based unit commitment : A parallel ABC approach using a workstation cluster" computers and electrical engineering, Vol.38,2012
13. C.Christopher Columbus, Sishaj Simon. K.Chandrasekaran " Nodal ant colony optimization for solving profit based unit commitment problem for Gencos" Applied soft computing .Vol 12 .2012
14. C.Christopher Columbus , Sishaj Simon "profit based unit commitment for Gencos using parallel NACO in a distributed cluster" Swarm and Evolutionary Computation , Vol 10.2013.
15. P.Shivasankari and Vikas Dubey , " A practical approach for profit based unit commitment in deregulated electricity market" , international journal of advanced research in Computer science and software engineering . Vol.3, 2013.
16. N.P Padhy , " Unit Commitment –Abiboliographical Survey", IEEE Transaction on Power system .Vol.19.2004

29-34

7.

Authors:	**Shibi K. John, T. V. U. Kiran Kumar, Alice Abraham**
Paper Title:	**An End-to-End Video Transmission System over Multimedia Wireless Sensor Networks**

Abstract: Multimedia transmission requires timely delivery for its real time application. Multimedia wireless sensors have special characteristics that make them different from traditional Wireless sensors. In this paper we propose an End-to-End Video streaming system over wireless multimedia sensor networks. First part of this paper explains the video encoding and the second part contains the route discovery along with Low Density Parity Check based forward error correction scheme to ensure error free data delivery The goal of the proposed system is to provide high

35-38

quality video with maximum signal to noise ratio and minimum mean square error . The system is fully implemented in MATLAB

Keywords: Wireless multimedia sensor network, video encoding, Peak signal to noise ratio, Low density parity check, Mean square error.

References:

1. Akyildiz, Ian F., Tommaso Melodia, and Kaushik R. Chowdhury. "A survey on wireless multimedia sensor networks." Computer networks 51.4 (2007): 921-960.
2. Soro, Stanislava, and Wendi Heinzelman. "A survey of visual sensor networks." Advances in Multimedia 2009 (2009).
3. Hou, X., D. Tipper, and J. Kabara. "Label-based multipath routing (lmr) in wireless sensor routing." Proceedings of the 6th International Symposium on Advanced Radio Technologies (ISART 04), Boulder, CO. 2004.
4. Wang, Wei, et al. "On energy efficient encryption for video streaming in wireless sensor networks." Multimedia, IEEE Transactions on 12.5 (2010): 417-426.
5. Stockhammer, Thomas, Miska M. Hannuksela, and Thomas Wiegand. "H. 264/AVC in wireless environments." Circuits and Systems for Video Technology, IEEE Transactions on 13.7 (2003): 657-673.
6. Zaidi, Syed Muhammad Asad, et al. "Multi-Channel Multi-Path video transmission over wireless sensor networks." Consumer Communications and Networking Conference (CCNC), 2013 IEEE. IEEE, 2013.
7. G. Pekhteryev, Z. Sahinoglu, P. Orlik, and G. Bhatti, "Image transmission over ieee 802.15.4 and zigbee networks," in Circuits and Systems. ISCAS 2005. IEEE International Symposium on, 2005, p. 3539.
8. T. Wark, P. Corke, J. Karlsson, P. Sikka, and P. Valencia, "Real-time image streaming over a low-bandwidth wireless camera network," in Intelligent Sensors, Sensor Networks and Information. ISSNIP 2007. 3rd International Conference on, 2007, p. 113.
9. J. Wang, M. Masilela, and J. Liu, "Supporting video data in wireless sensor networks," in Multimedia. ISM 2007. Ninth IEEE International Symposium on, 2007, p. 310.
10. S. Pudlewski and T. Melodia, "A distortion-minimizing rate controller for wireless multimedia sensor networks," Computer Communications, vol. 33, no. 12, pp. 1380 – 390, 2010.
11. W.-T. Chen, P.-Y. Chen, W.-S. Lee, and C.-F. Huang, "Design and implementation of a real time video surveillance system with wireless sensor networks," in Vehicular Technology Conference. VTC Spring2008. IEEE, 2008, p. 218.
12. P. Kulkarni, D. Ganesan, P. Shenoy, and Q. Lu, "Senseye: A multitier camera sensor network," in Multimedia, 13th ACM International Conference On,, 2005.
13. S. Nath, Y.Ke, P. B. Gibbons, B. Karp, and S. Seshan, "A distributed filtering architecture for multimedia sensors," in Intel Research TechnicalReport, 2004.
14. S. Hengstler, D. Prashanth, S. Fong, and H. Aghajan, "Mesheye: A hybrid-resolution smart camera mote for applications in distributed intelligent surveillance," in Information Processing in Sensor Networks. IPSN 2007. 6th International Symposium on, 2007, pp. 360 – 369.
15. Politis, M. Tsagkaropoulos, and S. Kotsopoulos, "Optimizing video transmission over wireless multimedia sensor networks," in Global Telecommunications Conference. IEEE GLOBECOM 2008. IEEE, 2008, p. 1.
16. S. Guo and T. Little, "Qos-enabled video streaming in wireless sensor networks," in INetwork Computing and Applications (NCA), 2010 9th IEEE International Symposium on, 2010, p. 214.
17. S. Qaisar and H. Radha, "Multipath multi-stream distributed reliable video delivery in wireless sensor networks," in Information Sciences and Systems, (CISS 2009). 43rd Annual Conference on, 2009, pp. 207– 212.
18. S. Gonzalez-Valenzuela, H. Cao, and V. Leung, "A multi-channel approach for video forwarding in wireless sensor networks," in Consumer Communications and Networking Conference (CCNC), 2010 7th IEEE, 2010, p. 1.

8.

Authors:	**Th. Kiranbala Devi, Nganthoi Naorem**
Paper Title:	**Seismic Vulnerability Assessment of Existing Buildings: It's Importance**

Abstract: Earthquake induced damage has been increased over the few years. Gujarat (2001), Sumatra (2004), Pakistan (2005) and Haiti (2010) are the examples of devastating damage due to earthquake. Collapse of non – engineered and engineered buildings and structures is the chief contributor to the loss of lives and injuries to people. Vulnerability Atlas of India states that there are about 11 million seismically vulnerable houses in Seismic Zone- V , while the corresponding figure for Seismic Zone – IV is 50 million. In all, there are about 80 million building units in India, which are vulnerable, and pose unprecedented risk, if earthquake strikes. However, severe damage was observed in a relatively small percentage of existing buildings even after damaging earthquakes in the World. Identifying such vulnerable buildings to future earthquake is important. To identify such buildings, three levels of seismic vulnerability assessment methods starting from simple to sophisticated procedure, (a) Rapid Visual Screening (RVS) , (b) Simplified Vulnerability Assessment (SVA) and (c) Detailed Vulnerability Assessment (DVA) can be carried out according to the problems detected in the building.

Keywords: Collapse, damage, seismic zone, structures, vulnerable

References:

1. Agarwal, S.K. , Chourasia, Ajay, and Parashar, J. (2004), "Estimation of Seismic Vulnerability of Buildings in Delhi" , DST Report, CBRI, Roorkee.
2. Agarwal, S.K., and Chourasia, Ajay, (2006)," Estimation of Seismic Vulnerability of Buildings of Delhi Municipal Area:, " 1st India Disaster Management Congress, Nov. 28-30, 2006, New Delhi.
3. Agarwal, S.K., Chourasia, Ajay, and Parashar, J. (2002), "Seismic Evaluation & Retrofitting of Existing Buildings" , 12th Symposium on Earthquake Engineering , Indian Institute of Technology, Roorkee.
4. ATC- 21(1988)," Rapid Visual Screening of Buildings for Potential Seismic Hazards: Supporting Documentation". Applied Technology Council, Redwood City, CA, USA.
5. CBRI Report (1994), " Pilot Project on Repair and Strengthening of Earthquake Damaged Houses in Maharastra". CBRI Roorkee.
6. FEMA 273-1997,(1997), "NEHRP Guidelines for the Seismic Rehabilitation of the Buildings", JRS.J.A. Blume & Associates, Engineers, San Francisco, C.A. 94103.
7. FEMA 178-1992,(1992), "NEHRP Handbook for the Seismic Evaluation of Existing Buildings", Building Seismic Safety Council, Washington, D.C.
8. IS :456-2000,(2000), "Criteria for Practice for Plane and Reinforced Concrete", Bureau of Indian Standards, New Delhi.
9. IS :1893-2002,(2002), "Criteria for Earthquake Resistant Design of Structure ", Bureau of Indian Standards, New Delhi.
10. IS :1905-1987,(1987), "Code of Practice for Structural Use of Unreinforced Masonry", Bureau of Indian Standards, New Delhi.
11. IS :13935-1993,(1993), "Repair and Seismic Strengthening of Existing Buildings - Guidelines", Bureau of Indian Standards, New Delhi.
12. Ravi Sinha and Alok Goyal, " A National Policy for Seismic Vulnerability Assessment of Buildings and Procedure for Rapid Visual Screening of Buildings for Potential Seismic Vulnerability".

39-46

13. Shunsuke Otani ,(2000)," Seismic Vulnerability Assessment Methods for Buildings in Japan" Proc. Earthquake Engineering and Engineering Seismology, Vol. 2, Number – 2 , September,2000, pp.47 – 56.
14. USGS – Science for Changing World

9.

Authors: **Nian Zhang, Tilaye Alemayehu, Pradeep Behera**

Paper Title: **Nonlinear Autoregressive (NAR) Forecasting Model for Potomac River Stage using Least Squares Support Vector Machines (LS-SVM)**

Abstract: This paper investigates the ability of a least-squares support vector machine (LS-SVM) model to improve the accuracy of streamflow forecasting. Cross-validation and grid-search methods are used to automatically determine the LS-SVM parameters in the forecasting process. To assess the effectiveness of this model, streamflow records from Geological Survey (USGS) gaging station 1652500 on Four Mile Run of the Potomac River, were used as case studies. The performance of the LS-SVM model is compared with the recurrent neural networks model trained by Levenberg-Marquardt backpropagation algorithm. The results of the comparison indicate that the LS-SVM model is a useful tool and a promising new method for streamflow forecasting.

Keywords: Water Quantity Prediction, Least Squares Support vector Machine.

References:

1. N. Zhang, "Urban Stormwater Runoff Prediction Using Recurrent Neural Networks," The Eighth International Symposium on Neural Networks (ISNN), Guilin, China, 2011.
2. N. Zhang, "Prediction of Urban Stormwater Runoff in Chesapeake Bay Using Neural Networks," The Eighth International Symposium on Neural Networks (ISNN), Guilin, China, 2011.
3. N. Zhang and S.H. Lai, "Runoff Quantity Analysis of Urban Catchments Based on Neural Networks Method," The IASTED International Symposia on Imaging and Signal Processing in Healthcare and Technology (ISPHT), Washington, DC, May 16-18, 2011.
4. N. Zhang and S.H. Lai, "Water Quantity Prediction Based on Particle Swarm Optimization and Evolutionary Algorithm Using Recurrent Neural Networks," 2011 International Joint Conference on Neural Networks (IJCNN), San Jose, CA, July 31-August 5, 2011.
5. G. Ji, J.C. Wang, Y. Ge, and H.J. Liu, "Urban Water Demand Forecasting by LS-SVM with Tuning Based on Elitist Teaching-Learning-Based Optimization", The 26th Chinese Control and Decision Conference (2014 CCDC), pp. 3997-4002, 2014.
6. Z. Liu, X. Wang, L. Cui, X. Lian, J. Xu, "Research on Water Bloom Prediction Based on Least Squares Support Vector Machine," 2009 WRI World Congress on Computer Science and Information Engineering, vol.5, pp. 764 - 768, 2009.
7. Y. Xiang and L. Jiang, "Water Quality Prediction Using LS-SVM and Particle Swarm Optimization," Second International Workshop on Knowledge Discovery and Data Mining, pp. 900- 904, 2009.
8. W. Liu, K. Chen, and L. Liu, "Prediction Model of Water Consumption Using Least Square Support Vector Machines Optimized by Hybrid Intelligent Algorithm," 2011 Second International Conference on Mechanic Automation and Control Engineering (MACE), pp. 3298- 3300, 2011.
9. L. Liang and F. Xie, "Applied Research on Wastewater Treatment Based on Least Squares Support Vector Machine," 2011 International Conference on Remote Sensing, Environment and Transportation Engineering (RSETE), pp. 4825- 4827, 2011.
10. X. Zhang, S. Wang, and Y. Zhao, "Application of Support Vector Machine and Least squares Vector Machine to Freight Volume Forecast," 2011 International Conference on Remote Sensing, Environment and Transportation Engineering (RSETE), pp. 104- 107, 2011.
11. R.J. Liao, J.P. Bian, L.J. Yang, S. Grzybowski, Y.Y. Wang, and J. Li, "Forecasting Dissolved Gases Content in Power Transformer Oil Based on Weakening Buffer Operator and Least Square Support Vector Machine–Markov," Generation, Transmission & Distribution, IET, vol. 6, no. 2, pp. 142- 151, 2012.
12. L. Hou, Q. Yang, J. An, "An Improved LSSVM Regression Algorithm," International Conference on Computational Intelligence and Natural Computing, vol. 2, pp. 138- 140, 2009.
13. X. Zhang, Y. Zhao, and S. Wang, "Reliability Prediction of Engine Systems Using Least Square Support Vector Machine," 2011 International Conference on Electronics, Communications and Control (ICECC), pp. 3856- 3859, 2011.
14. N. Zhang, C. Williams, E. Ososanya, and W. Mahmoud, "Streamflow Prediction Based on Least Squares Support Vector Machines," ASEE-2013 Mid-Atlantic Fall Conference, Washington, D.C., October 11-13, 2013.
15. T. A. Stolarski, "System for Wear Prediction in Lubricated Sliding Contacts," Lubrication Science, 1996, 8 (4): 315 -351.
16. Suykens J A K,Vandewalle J, "Least Squares Support Vector Machine Classifiers," Neural Processing Letter, 1999, 9(3):293-300.
17. J.A.K. Suykens, T. Van Gestel, J. De Brabanter, B. De Moor, and J. Vandewalle, "Least Squares Support Vector Machines," World Scientific, Singapore, 2002.
18. J.A.K. Suykens and J. Vandewalle, "Least Squares Support Vector Machine Classifiers," Neural Processing Letters, 9:293–300, 1999.
19. J.A.K. Suykens, J. De Brabanter, L. Lukas, and J. Vandewalle, "Weighted Least Squares Support Vector Machines: Robustness and Sparse Approximation," Neurocomputing, vol. 48, no. 1-4, pp. 85–105, 2002.
20. D.J.C. MacKay, "Comparison of Approximate Methods for Handling Hyperparameters," Neural Computation, vol. 11, pp. 1035–1068, 1999.
21. De Brabanter K., Karsmakers P., Ojeda F., Alzate C., De Brabanter J., Pelckmans K., De Moor B., Vandewalle J., Suykens J.A.K., "LS-SVMlab Toolbox User's Guide version 1.8," Internal Report 10-146, ESAT-SISTA, K.U.Leuven (Leuven, Belgium), 2010.
22. J. A. Nelder and R. Mead, "A Simplex Method for Function Minimization," Computer Journal, 7, 308-313, 1965.
23. S. Xavier-de-Souza, J.A.K. Suykens, J. Vandewalle, and D. Bolle, "Coupled Simulated Annealing," IEEE Transactions on Systems, Man and Cybernetics - Part B, vol. 40, no. 2, pp. 320–335, 2010.

47-51

10.

Authors: **Surabhi Chetia, T. S. Muralidhar, Pedenla Lama, Juganta Das**

Paper Title: **Utility of Interface Technology for Conversion of Hand Gestures to Digital Display – Voice Converter**

Abstract: the increase in human-machine interactions in our daily lives has made user interface technology progressively more important. Physical gestures as intuitive expressions will greatly ease the interaction process and enable humans to more naturally command computers or machines. Many kinds of existing devices can capture gestures, such as a "Wiimote," joystick, trackball and touch tablet. Some of them can also be employed to provide input to a gesture recognizer. But sometimes, the technology employed for capturing gestures can be relatively expensive, such as a vision system. In the proposed system, accelerometer based gesture recognition technique is used. The proposed system uses 3-Axes MEMS accelerometer with PIC16F877A Microcontroller. The accelerations of a hand in motion in three perpendicular directions are detected by three axes accelerometers respectively and based on the hand gestures appropriate voices are played through APR Voice which is also interfaced with the microcontroller. Objective of the project work to develop a device for conversion of sign language to suitable text and speech as output.

Keywords: interface technology, Physical gestures, APR Voice, 3-Axes MEMS accelerometer, PIC16F877A

52-56

Microcontroller

References:

1. Chambers, G.S. Venkatesh, S., West, G.A.W., Bui. H.H, "Hierarchical recognition of intentional human gestures for sports video annotation' In: Proceedings. 16th International Conference on Pattern Recognition, vol. 2, pp. 2002, 1082–1085.
2. Cheok. A.D, Ganesh Kumar. K., Prince. S, "Micro-accelerometer based hardware interfaces for wearable computer mixed reality applications" In: Proceedings. Sixth International Symposium on Wearable Computers, 2002, pp. 223–230.
3. Deng. J.W, Tsui. H.T, "An HMM-based approach for gesture segmentation and recognition" In: Proceedings. 15th International Conference on Pattern Recognition. vol. 3, 2000, pp. 679–682.
4. Kelly. D, McDonald. J, Markham. C, "A person independent system for recognition of hand postures used in sign language" Pattern Recogn. Lett. 31(11), 2010, 1359–1368.
5. LIS3LV02DQ Datasheet, 'MEMS Inertial Sensor', 3-Axis-±2g/±6g Digital Output Low Voltage Linear Accelerometer.
6. Reifinger. S, Wallhoff. F, Ablassmeier. M, Poitschke. T, Rigoll. G, "Static and Dynamic Hand-Gesture Recognition for Augmented Reality Applications. In: Human-Computer Interaction". HCI Intelligent Multimodal Interaction Environments. LNCS, vol. 4552, 2007, pp. 728–737. Springer, Heidelberg.
7. Zaki. M.M, Shaheen. S.I, "Sign language recognition using a combination of new vision based features". Pattern Recogn. Lett. 32(4), 2011, 572–577.
8. Yang Quan, "A Classification Method for Chinese Sign Language Recognition" Industrial Electronics and Applications (ICIEA), 2010 the 5th IEEE Conference. 15-17 June 2010, 1537 – 1542.
9. Bui. T.D, "Recognizing Postures in Vietnamese Sign Language with MEMS Accelerometers Sensors". Journal IEEE. Volume: 7, Issue: 5. May 2007, page 707 – 712.
10. Dharma P. Agrawal, "Apparatus for instantaneous translation of sign language". Publication number US 8493174 B2, Application number US 12/831,230. Publication date. 23 Jul 2013
11. Archana. S. Ghotkar and Dr. Gajanan K. Kharate. "Study of vision based hand gesture recognition using Indian sign language". International Journal on Smart Sensing and intelligent systems, March 2014, vol.7, no.1.
12. Qi Wang a, Xilin Chen b, Liang-Guo Zhang, Chunli Wang, Wen Gao. "Viewpoint invariant sign language recognition". Computer Vision and Image Understanding 108, 2007, 87–97.
13. Jeroen F. Lichtenauer , Emile A. Hendriks , Marcel J.T. Reinders , "Sign Language Recognition by Combining Statistical DTW and Independent Classification" , IEEE Transactions on Pattern Analysis & Machine Intelligence .Issue No.11, vol.30, November 2008, pp: 2040-2046.
14. Ashok K Sahoo, Gouri Sankar Mishra and Kiran Kumar Ravulakollu, "Sign Language Recognition: State of Art". ARPN Journal of Engineering and Applied Sciences. feb 2014, vol. 9, no. 2,

11.

Authors: **R. Suganthi, P. Kamalakannan**

Paper Title: **Synthesizing Model for Clustering Frequent Data Items in Multi-Database**

Abstract: Mainly, most of the large organizations have numerous databases and they do process and transact over the multiple branch database. The important issue of the multi database is selecting the frequent items from various branch databases and forwarding the items to head quarters to take the decision among all kinds of patterns. Here global decision is important role in head quarter level and some steps are followed to take critical decision in top level. First step is synthesizing high frequency item set based on local item set. Second step is to measure the association [13] among various items listed under high frequency. And the accuracy level of data set is improved by using the synthesizing and clustering algorithm.

Keywords: Multi database, Synthesizing patterns, local pattern analysis, patterns

References:

1. T. Ramkumar, S. Hariharan, S. Selvamuthukumaran, A survey on mining multiple data sources, Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery 3 (1) (2013) 1–11.
2. Han/Kamber/Pei, Tan/Steinbach/Kumar, and Andrew Moore , Data Mining Techniques Classification and Prediction 1997 : 33-70
3. Adhikari, Synthesizing global exceptional patterns in different data sources, Journal of Intelligent Systems 21 (3) (2012) 293–323
4. Adhikari, P. Ramachandrarao, W. Pedrycz, Developing Multi-Database Mining Applications, Springer-Verlag, London, 2010.
5. Wu X, Zhang S. Synthesizing high-frequency rules from different data sources. IEEE Trans Knowl Data Eng 2003, 15:353–367..
6. Adhikari A, Rao PR. Synthesizing heavy association rules from different real data sources. Pattern Recognit Lett 2008, 29:59–71
7. Nedunchezhian R, Anbumani K. Post mining– discovering valid rules from different sized data sources. Int J Inf Technol 2006, 3:47–53.
8. Adhikari, Clustering local frequency items in multiple databasess, Journal of Information Science 237 (2013) 221–241
9. J. Han, M. Kamber, Data Mining: Concepts and Techniques, Morgan
10. Kauffmann Publishers, 2001.
11. Ramkumar T, Srinivasan R. The effect of correction factor in synthesizing global rules in a multi-database mining scenario. J Appl Comput Sci 2009, 3:33– 38
12. Frequent Itemset Mining Dataset Repository. http://fimi.cs.helsinki.fi/data/
13. Kum HC, Chang JH, Wang W. Sequential pattern mining in multidatabases via multiple alignment. Data Min Knowl Discov 2006, 12:151–180:
14. Savasere A, Omiecinski E, Navathe S. An efficient algorithm for mining association rules in large databases. In: Proceedings of the Twenty First International Conferences on Very Large Data Bases. Zurich, Switzer-land; 1995, 432–444
15. Lenca P, Meyer P, Vaillant B, Lallich S. On selecting interestingness measures for association rules: user ori-ented description and multiple criteria decision aid. Eur J Oper Res 2008, 184:610–626
16. Liu H, Lu H, Yao J. Toward multi-database min-ing: identifying relevant databases. IEEE Trans Knowl Data Eng 2001, 13:541–553