Keynote Talk-1
Communication Networks: Traffic Data, Network Topologies, and Routing Anomalies

Speaker:

Ljiljana Trajkovic, Ph.D., P.Eng., Fellow of IEEE
President, IEEE Systems, Man, and Cybernetics Society (2014-15)
President, IEEE Circuits and System Society (2007)
Professor, Simon Fraser University, Canada

Abstract:

Understanding modern data communication networks such as the Internet involves collection and analysis of data collected from deployed networks. It also calls for development of various tools for analysis of such datasets. Collected traffic data are used for characterization and modeling of network traffic, analysis of Internet topologies, and prediction of network anomalies. In this talk, I will describe collection and analysis of real-time traffic data using special purpose hardware and software tools. Analysis of such collected datasets indicates a complex underlying network infrastructure that carries traffic generated by a variety of the Internet applications. Data collected from the Internet routing tables are used to analyze Internet topologies and to illustrate the existence of historical trends in the development of the Internet. The Internet traffic data are also used to classify and detect network anomalies such as Internet worms, which affect performance of routing protocols and may greatly degrade network performance. Various statistical and machine learning techniques are used to classify test datasets, identify the correct traffic anomaly types, and design anomaly detection mechanisms.

Brief biography:

Ljiljana Trajkovic received the Dipl. Ing. degree from University of Pristina, Yugoslavia, in 1974, the M.Sc. degrees in electrical engineering and computer engineering from Syracuse University, Syracuse, NY, in 1979 and 1981, respectively, and the Ph.D. degree in electrical engineering from University of California at Los Angeles, in 1986.

She is currently a Professor in the School of Engineering Science at Simon Fraser University, Burnaby, British Columbia, Canada. From 1995 to 1997, she was a National Science Foundation (NSF) Visiting Professor in the Electrical Engineering and Computer Sciences Department, University of California, Berkeley. She was a Research Scientist at Bell Communications Research, Morristown, NJ, from 1990 to 1997, and a Member of the Technical Staff at AT&T Bell Laboratories, Murray Hill, NJ, from 1988 to 1990. Her research interests include high-performance communication networks, control of communication systems, computer-aided circuit analysis and design, and theory of nonlinear circuits and dynamical systems.

Dr. Trajkovic serves as President (2014 – 2015) of the IEEE Systems, Man, and Cybernetics Society and served as President-Elect (2013), Vice President Publications (2012 – 2013 and 2010 – 2011), Vice President Long-Range Planning and Finance (2008 – 2009), and a Member at Large of its Board of Governors (2004 – 2006). She served as 2007 President of the IEEE Circuits and Systems Society. She was a member of the Board of Governors of the IEEE Circuits and Systems Society (2001 – 2003 and 2004 – 2005). She is Chair of the IEEE Circuits and Systems Society joint Chapter of the Vancouver/Victoria Sections. She was Chair of the IEEE Technical Committee on Nonlinear Circuits and Systems (1998). She is General Co-Chair of SMC 2016 and served as General Co-Chair of HPSR 2014, Technical Program Co-Chair of ISCAS 2005, and Technical Program Chair and Vice General Co-Chair of ISCAS 2004. She served as an Associate Editor of the IEEE Transactions on Circuits and Systems (Part I) (2004 – 2005 and 1993 – 1995), the IEEE Transactions on Circuits and Systems (Part II) (1999 – 2001 and 2002 – 2003), and the IEEE Circuits and Systems Magazine (2001 – 2003). She was a Distinguished Lecturer of the IEEE Circuits and Systems Society (2010 – 2011 and 2002 – 2003). She is a Fellow of the IEEE.

Keynote Talk-2
Inertial Sensor Based Wearable Devices on Healthcare

Speaker:

Pau-Choo (Julia) Chung, Ph.D., Fellow of IEEE

Professor, National Cheng Kung University, Taiwan

Vice President of IEEE Computational Intelligence Society (CIS) on Membership Activities

Abstract:

Despite the fact that the concept of using long-term personal records has been well recognized for decades, sparse patient physical exam records are still the main base for disease diagnosis and treatment. One of the main reasons for this is the lack of devices and systems for effectively collecting personal data and turning the data into health-meaningful information.

The current development of wearable devices with IoT presents a huge potential for fulfilling the needs of long-term data collecting and enabling patients to be monitored in real-time. Thus various types of wearable devices have been developed. Wearable vital sign measuring devices with IoT enable the elderly with chronic diseases to be monitored, connected to healthcare providers and offered treatment at the right moment. Smart drug dispensers provide automatic reminders and medication recording capability for better treatment. In this talk, we will focus on the introduction of the inertial sensors based wearable devices for motion analysis and their applications to healthcare. Methods for turning the measured inertial signals into information for better understanding the elderly situation will also be presented. Along the talk a brief overview on the development of wearable devices and IoT and their impacts on reshaping healthcare will also be given.

Brief biography:

Pau-Choo (Julia) Chung (S'89-M'91-SM'02-F'08) received the Ph.D. degree in electrical engineering from Texas Tech University, USA, in 1991. She then joined the Department of Electrical Engineering, National Cheng Kung University (NCKU), Taiwan, in 1991 and has become a full professor in 1996. She was elected Distinguished Professor of NCKU in 2005. She served as the Director of Electrical Laboratory (2005-2008), the Director of the Center for Research of E-life Digital Technology (2005-2008), the Director of Institute of Computer and Communication Engineering (2008-2011), the Vice Dean of College of Electrical Engineering and Computer Science (2011), and the Chair of Department of Electrical Engineering, NCKU. She also served as the Program Director of the Intelligent Computing Division of the Ministry of Science and Technology (previously called National Science Council), Taiwan.

Dr. Chung's research interests include image/video analysis and pattern recognition, biosignal analysis and machine learning. She applies most of her research results to innovative healthcare and medical applications. Dr. Chung served as the program committee member in many international conferences. She was a Member on IEEE International Steering Committee, IEEE Asian Pacific Conference on Circuits and Systems (2006-2008), the Special Session Co-Chair of ISCAS 2009 and 2010, the Special Session Co-Chair of ICECS 2010, and the TPC of APCCAS. Dr. Chung was the Chair of IEEE Computational Intelligence Society (CIS) (2004-2005), Tainan Chapter. She was the Chair of the IEEE Life Science Systems and Applications Technical Committee and a member of the BioCAS Technical Committee and the Multimedia Systems & Applications Technical Committee of the CAS Society. She also serves as the Associate Editor of IEEE Transactions on Neural Networks and Learning Systems and served as the Editor of Journal of Information Science and Engineering, Associate Editor of Soft Computing, Associate Editor of Multidimensional Signal Processing, the Guest Editor of IEEE Transactions on Circuits and Systems-I, and the Secretary General of Biomedical Engineering Society of the Republic of China. She is one of the co-founders of Medical Image Standard Association (MISA) in Taiwan.

Pau-Choo Chung was a member in Board of Governor (BoG) of CAS Society (2007-2009, 2010-2012). She served as an IEEE CAS Society Distinguished Lecturer (2005-2007). She is an ADCOM member of IEEE CIS and the Chair of Distinguished Lecturer Program of IEEE CIS. She is a Member of Phi Tau Phi honor society and is an IEEE Fellow since 2008. Currently she is the Vice President of IEEE Computational Intelligence Society (CIS) on membership activities.

Keynote Talk-3
Women in Engineering taking the lead for a better world

Speaker:

Margaretha A.K. Eriksson
Director-Elect, IEEE Region 8 (2015-16)
Irbis Konsult AB and Halmstad University, Sweden

Abstract:

This talk will focus on women's stride in in society and Science, Technology, Engineering, and Mathematics (STEM) specifically, looking back in history, as well as into the future. Several examples of women in STEM will be shared, including speaker's own family history of four generations of strong and prosperous women, and what made them the individuals they became. An outline will be given on how role models and mentors support women's progress in society, and what makes a person a mentor or role model. Useful career advice for creating a successful and rewarding career, achieving a balanced work and family lifestyle will be delivered. Finally, essential details on what it takes to be a professional person will be shared.

Brief Biography:

Margaretha Eriksson is the president and founder of Irbis Konsult AB. Margaretha provides training and management consulting in cybersecurity and engineering management. With the University of Halmstad, she has created academic courses in Risk analysis and IT system security and Web based information security. As Engineering Management consultant she has worked with Ericsson, Tetra Pak, Volvo, and Bombardier in the field of product management, information management and information security. She has also worked as technical writer and technical translator for IBM, SAP, Oracle, Microsoft, and as Subject Matter Expert on electronics terminology for the European Union term data base. Margaretha holds a M. Sc. from the Royal Institute of Technology in Stockholm, Sweden. She has also studied cyber security and social anthropology. She is the co-author of one book on cyber security, and papers on product information management, translation issues, and applied cyber security. Margaretha has designed and taught courses at Stockholm University, Örebro University and Halmstad University in Sweden. Margaretha Eriksson serves on the IEEE Board of Directors as Region 8 Director Elect. She participates in the Global Strategy Ad Hoc Committee as a member. Margaretha is member of MGA as IEEE Region 8 Director Elect, and she was twice been the President of IEEE Sweden Section. She served as Section Chair 1999-2002 and 2009-2010. She was representative to the IEE in UK 2002-2004. Margaretha has been named a Distinguished Lecturer for the R8 PACE Committee.

She is a member of WIE and was on the WIE Committee 2002-2005 and as WIE Newsletter Editor 2005-2006. She is also founder of the WIE affinity group in Sweden.

She was member of the Board of Governors of the IEEE Engineering Management Society 2002-2007

Keynote Talk-4

Today's Industry Applications of Power Electronics and update on IEEE's Industry Applications Society

Speaker:

David B. Durocher
President, IEEE Industry Applications Society (2015-16)
Manager, Global Mining, Metals & Minerals Industry,
Eaton Corporation in Wilsonville, OR, USA

Abstract:

This presentation will focus on industry applications for a) A medium voltage adjustable frequency drive using high-efficiency IGBTs installed as an upgrade for a steel mill runout table transfer system resulting in monthly energy savings of US $45,000, b) Application of large scale three-phase uninterruptable power supply (UPS) systems applied in a Greenfield Data Center, delivering high-efficiency power conversion in one of the world's highest energy density systems and c) The role that power electronics will play in tomorrow's Microgrid applications for industry and how users can capitalize on the future of open energy markets. This will be followed by a review of the IAS's last 50 years of accomplishments and a video outlining the Society's path forward into the future.

Brief Biography:

David B. Durocher (IEEE SBM '77-M '97-SM '99) received a B.S.E.E. degree from Oregon State University, Corvallis, in 1978. He is currently Global Mining, Metals & Minerals Industry Manager, with Eaton Corporation in Wilsonville. He has over 35 years of experience with Westinghouse and Eaton serving in a variety of product engineering, sales and global marketing roles, authoring numerous technical papers that have been presented at conferences around the world and published in IEEE Industry Applications, Plant Engineering and EC&M Magazine. Dave is a Senior Member IEEE and presently serves as a member of the IEEE IAS Mining Industry Committee, Cement Industry Committee, Pulp & Paper Industry Committee and as President of the IEEE Industry Applications Society.

Keynote Talk-5

A Global View of the Commercial Scale Renewable Energy and the Smart Grid

Speaker

Saifur Rahman, Ph.D., Fellow of IEEE
Professor, Virginia Tech, USA
President-Elect (2016-17), IEEE PES

Abstract:

With the focus on environmental sustainability and energy security, power system planners are looking at renewable energy as supplements and alternatives. But such generation sources have their own challenges - primarily intermittency. Many believe that the smart grid – due to its inherent communication, sensing and control capabilities – will have the ability to manage the load, storage and generation assets (including renewables) in the power grid to enable a large-scale integration of distributed generation. In a smart grid, information about the state of the grid and its components can be exchanged quickly over long distances and complex networks. It will therefore be possible to have the integration of sustainable energy sources, such as wind, solar, off-shore electricity, etc. for smoother system operation. But in order for this to be possible, the electric utility will have to evolve, and change their ways of operation to become an intelligent provider of these services. This lecture introduces the operational characteristics of renewable energy sources, and various aspects of the smart grid - technology, standards and regulations. It also addresses the interplay among distributed generation, storage and conventional generation to provide an efficient operational strategy in the context of the smart grid.

Brief Biography:

Professor Saifur Rahman is the founding director of the Advanced Research Institute (www.ari.vt.edu) at Virginia Tech where he is the Joseph R. Loring professor of electrical and computer engineering. He also directs the Center for Energy and the Global Environment (www.ceage.vt.edu). He is the President-elect of IEEE Power & Energy Society for 2016 and 2017. He is a Life Fellow of the IEEE and an IEEE Millennium Medal winner. He was the founding editor-in-chief of the IEEE Electrification Magazine and the IEEE Transactions on Sustainable Energy. He is currently serving as a member of the Board of Governors of the IEEE Society on Social Implications of Technology (SSIT). In 2006 he served on the IEEE Board of Directors as the vice president for publications. He served as the chair of the US National Science Foundation Advisory Committee for International Science and Engineering from 2010 to 2013. He is a Distinguished Lecturer for the IEEE Power & Energy Society, and has lectured on smart grid, energy efficiency, renewable energy, demand response, distributed generation and critical infrastructure protection topics in over 30 countries on all six continents.

Keynote Talk-6
The Evolution of Interior Permanent Machines and their Control Techniques for Traction and Wind Power Applications
Speaker

Fazlur Rahman, Ph.D., Fellow of IEEE
Professor and Head, Energy Systems
The University of New South Wales, Sydney, Australia

Abstract:

This keynote traces the development of the interior permanent magnet machine for traction and wind power generator applications. These two application areas have seen significant developments in recent years, both in terms of machine design and control techniques. Mechanical sensorless control is very desirable in these applications, because of harsh operating conditions and lack of space, accessibility and maintenance prevailing in these two types of applications. This talk also reviews and describes the current developments in sensorless control techniques for such drives.

Brief Biography:

Muhammed F. Rahman graduated in Electrical Engineering in 1970 from the Bangladesh University of Engineering and Technology, Dhaka. He obtained his Masters and Ph.D. in 1975 and 1978, respectively, from University of Manchester Institute of Science and Technology, U.K. He subsequently worked as a Systems Design Engineer at the General Electric Company (U. K.) for two years before joining the National University of Singapore in 1980. He joined the University of New South Wales, Australia in 1988 as a Senior Lecturer, where is currently a Professor. His research interests are in Power Electronics, Motor Drives, Electrical Machines and Motion Control System. He is a Fellow of the IEEE.

Invited Talk-1
Event Detection from Millions of Tweets related to Disasters using High-Performance Feature Selection Technique

Speaker

Takako Hashimoto, Ph.D.
Chair, IEEE Women in Engineering (WIE) 2015
Coordinator, IEEE R10 WIE (2011-2014)
Past Chair, IEEE Japan Council WIE (2012-2013)
Visiting Researcher, University of California, Los Angeles, USA (2015)
Professor, Chiba University of Commerce, Japan

Abstract:

Social media offers a wealth of insight into how significant events such as the Great East Japan Earthquake, and the Nepal Earthquake affect individuals. The scale of available data, however, can be intimidating: during the Great East Japan Earthquake, over 8 million tweets were sent each day from Japan alone. Conventional word vector-based event-detection techniques for social media that use Latent Semantic Analysis, Latent Dirichlet Allocation, or graph community detection often cannot scale to such a large volume of data due to their space and time complexity. To alleviate this problem, we propose an efficient method for event detection by leveraging a fast feature selection algorithm called CWC. Our proposed method makes it possible to detect events from vast datasets. To demonstrate our method's effectiveness, we extract events from a dataset of over two hundred million tweets sent in the 21 days following the Great East Japan Earthquake and five million tweets sent in the 14 days after the Nepal Earthquake. With CWC, we can identify events from this dataset with great speewd and accuracy.

Brief Biography:

Takako Hashimoto graduated from the Ochanomizu University in 1985, and received a Ph.D. in computer science, specialization in multimedia information processing, from the Graduate School of Systems and Information Engineering of University of Tsukuba in 2005. She worked at the software R&D center of Ricoh Co. Ltd., in Japan for 24 years, and participated in the development of many software products as a technical leader. She has a rich project management experience including international collaborative research handling as well. From April of 2009, she was involved in Chiba University of Commerce as Associate Professor. In 2015, she has become Professor of Chiba University of Commerce. In 2015, she has stayed at University of California, Los Angeles as a visiting researcher. She has served as an Associate Editor of Journal of IEICE Data Engineering and Information Management and IPSJ Transactions On Databases (TOD). She is a Board Member of the Database Society of Japan and IEEE Japan Council. Currently, she has focused on the data mining research and the social media analysis, especially topic extraction from millions of tweets related to the East Japan Great Earthquake. She is developing the high performance feature selection technique for big data. She's also conducting global researches for developing the social media analysis platform in multi-language/cultural environment.

Invited Talk-2
Feature-Based Discrimination for some Respiratory Disease

Speaker

Norliza Mohd Noor , Ph.D.
Associate Professor, Universiti Teknologi Malaysia (UTM), Kuala Lumpur Campus
2015 IEEE Region 10 Individual Benefits & Services Coordinator

Abstract:

Respiratory disease is among the top cause of death in the world where two million deaths worldwide are due to tuberculosis every year, and lung cancer is the leading killer cancer among its group, contributing 17.8 percent of all total cancer deaths. Pneumonia remains an important cause of morbidity and mortality in the US as both primary and secondary infection. In Malaysia, lung diseases such as tuberculosis, pneumonia, heart failure, emphysema, lung cancer and interstitial lung disease are common in Malaysia. Radiologists' interpretation of the chest radiograph provide the cheapest and fast method in diagnosing the lung disease, however, experienced and fatigue may hinder the accuracy of the diagnosis. Computer aided diagnostics may provide as a second opinion tool to assist the medical practitioner. Several methods in feature extraction were investigated for discrimination between lung disease present and absent namely for lobar pneumonia and pulmonary tuberculosis using chest radiograph. Linear discriminant function and quadratic discriminant function were used as the discrimination method. The performance evaluation of these methods was evaluated using Type 1 Error and Type 2 Error, ROC curve and area under the curve.

Brief Biography:

RaNorliza Mohd (pronounced as Mohamed) Noor is currently attached as Associate Professor in UTM zak School of Engineering and Advanced Technology, Universiti Teknologi Malaysia (UTM), Kuala Lumpur Campus. She received her B. Sc. In Electrical Engineering from Texas Tech University in Lubbock, Texas and her Master of Electrical Engineering (by research) and PhD (Electrical Engineering) from UTM. Her research area is in image processing and image analysis. Her current work concentrates on medical image analysis for lung diseases. She has published many papers in journals and in indexed conference proceedings, and has published one academic book and two book chapters. She is a senior member of IEEE where she has been a member for more than 25 years starting as student member while studying in USA. In 1998-2001, she held several key positions in IEEE Malaysia Section. She is the founding chapter chair for IEEE Signal Processing Society Malaysia Chapter in 2002 and she held the position till 2006. She is an active IEEE volunteer and held key positions in IEEE Signal Processing Society Malaysia Chapter and IEEE Engineering Medicine and Biology Society Malaysia Chapter till now. She has co-organised many IEEE conferences in Malaysia under these two chapters. In 2014, she was the co-chair for IEEE Region 10 Symposium (TENSYMP2014) that was held in Kuala Lumpur. She was elected as the IEEE Malaysia Section Chair for two years 2013-2014, and currently she is the IEEE R10 Individual Benefits and Services Coordinator and MGA Geographic Unit Operations Support Committee – Technical Chapter Representative.

Invited Talk-3

On Application of Evolutionary Computational Techniques for Optimal Feature Subset Selection

Speaker

Basabi Chakraborty, Ph.D.
Professor, Faculty of Software and Information Science, Iwate Prefectural University, Japan

Abstract:

Feature subset selection is an essential preprocessing task for pattern classification, data mining or machine learning applications. It basically depends on selecting a criterion function for evaluation of the feature subset and a search strategy to find the optimal feature subset from a large number of feature subsets. Evolutionary computational approaches are well suited for optimization problems and are good candidates for use as search techniques for optimal feature subset selection.

In this lecture I would like to present our research works on developing some measures for feature evaluation. I will also present some approaches for optimal feature subset selection based on Genetic Algorithm (GA) and Particle Swarm Optimization (PSO) using the developed measures as the evaluation function. Finally I will mention some practical applications to show the effectiveness of the proposed techniques.

Brief Biography:

Basabi Chakraborty received B.Tech, M.Tech and Ph. D degrees in RadioPhysics and Electronics from Calcutta University, India and worked in Indian Statistical Institute, Calcutta, India until 1990. From 1991 to 1993 she worked as a part time researcher in Advanced Intelligent Communication Systems Laboratory in Sendai, Japan. She received another Ph. D in Information Science from Tohoku University, Sendai in 1996. From 1996 to 1998, she worked as a postdoctoral research fellow in Research Institute of Electrical Communication, Tohoku University, Japan. In 1998 she joined as a faculty in Software and Information Science department of Iwate Prefectural University, Iwate, Japan. Her main research interests are in the area of Pattern Recognition, Image Processing, Soft Computing Techniques, Biometrics, Data Mining and Online Social Media Mining. She is a senior member of IEEE, member of ACM, Japanese Neural Network Society (JNNS), Japanese Society of Artificial Intelligence(JSAI), Executive committee member of ISAJ (Indian Scientists Association in Japan), IEEE JC WIE (Women in Engineering).

Invited Talk-4
Video Processing and Communications Researches

Speaker

Supavadee Aramvith, Ph.D.
Head, Communication Engineering Division, Department of Electrical Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand
2015 IEEE Region 10 Women in Engineering (WIE) Coordinator

Abstract:

In this talk, my researches on video processing and communications conducted at video technology research group, Chulalongkorn University. There are several areas of researches. Firstly, wireless video coding and transmission researches are discussed. The aim is to deliver very good quality video under channel error constraint. Secondly, we have conducted many years of researches on video analytics for surveillance applications. Thirdly, current project that integrates the knowledge of video analytic, video coding, and wireless communications is on-going. We are developed the prototype of video based security monitoring using high speed wireless communication system. The fourth area is the accessible applications which is Electronics Thai Sign Language Communication System. The last area is social media analysis on East Japan Earthquake which is the collaboration with Gakushuin University, Japan.

Brief Biography:

Ms Supavadee Aramvith took her M.S. in 1996 and Ph.D in 2001 in Electrical Engineering at the University of Washington, Seattle, USA. She studied and completed in 1993 her B.Sc. gaining the First Class Honors in Computer Science at Mahidol Univerity, Thailand. She was awarded of the Royal Thai Government Scholarship – Ministry of Science, Technology, and Environment (1994-2000) and the Invitation Fellowship for Research in Japan (Short-term), Information System Synthesis Laboratory, Graduate School of Information Science and Technology, Osaka University, Japan, April 16 – May 30 2005. Supavadee research interests include computer vision techniques in surveillance applications; digital video coding and processing; transmissions of digital video over wireless and IP networks; image/video retrieval techniques - video classification; and applications in multimedia communication System.

Tutorial-1

New Criminal and Victim Identification Methods for Sexual Offenses against Women and Children

Speaker

Adams Wai Kin Kong, Ph.D.
Associate Professor, Nanyang Technological University, Singapore

Abstract:

With recent advances in Internet and multimedia technology, the involvement of digital images in sexual offenses against women and children has been increasing significantly. These sexual offenses can be rapes, child sexual abuses and gang rapes. Even in one child sexual abuse case, evidence images and videos can be over 100 gigabytes. In Canada alone, Cybertip.ca received over 21,000 tips about online child exploitation between 2002 and 2008 and found 12,696 websites offering child sexual abuse images. Identifying criminals from this digital evidence can be very challenging because they are usually careful to hide or cover their faces and tattoos. All traditional biometric identification methods, e.g., faces, tattoos and fingerprints are not applicable to these evidence images. This talk will present a set of new computational methods for identifying criminals and victims in this digital evidence.

Brief biography:
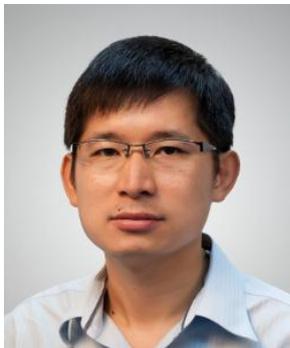
Dr. Adams Wai Kin Kong received the Ph.D. degree from the University of Waterloo, Canada. Currently, he is an associate professor at the Nanyang Technological University, Singapore. His papers have been published in TPAMI, TIP, TIFS, TSMC, TCSVT, CVPR and Pattern Recognition. One of his papers was selected as a spotlight paper by TPAMI and another one was selected as Honorable Mention by Pattern Recognition. With his students, he received best student paper awards in The IEEE Fifth International Conference on Biometrics: Theory, Applications and Systems, 2012 and IEEE International Conference on Bioinformatics and Bioengineering, 2013. In the summer of 2008, he served as an expert witness to the U.S. Department of Justice for a case of child sexual abuse. He is working closely with Singapore Police Force for a number of forensic projects. He has developed seven patents; four of his patents have been approved, and the others have been filed. His research interests include biometrics, forensics, image processing and pattern recognition.

Tutorial -2

Cities in data enriched world

Speaker

Iva Bojic, Ph.D.
MIT, USA, MIT Senseable City Lab in Singapore

Abstract:

Cities are not only important because every day more and more people live in them, but also because they are very often centers of innovation and prosperity. In addition to official statistic that is collected on a city level, cities are also places where people leave most of their digital trails. Precisely these almost unlimited sources of city data make local governments insufficient to deal with the data on their own in order, among other things, to improve the quality of life for their citizens. Luckily, the number of cities where this is acknowledged as a problem is rising on a daily basis. One of very successful examples how this problem can be addressed is to build publicly available platforms where city data is shared with anybody who shows an interest in it. In that way, local governments do not stand anymore alone in their efforts to increase life quality.
mechanisms.

Brief biography:

Dr. Iva Bojic is a computer scientist with a research emphasis in telecommunications and urban studies. She holds two masters – one in Computer Science and the other one in Mathematics, both of which are from University of Zagreb, Croatia. Her doctoral thesis on "Self-organizing Synchronization in Machine-to-Machine Communication Systems" was awarded the Silver Plaque Josip Loncar – the Dean's award for outstanding doctoral dissertation and particularly successful scientific research. In 2012 Dr. Bojic received the "Google Anita Borg" award from Google for strength of academic performance, leadership experience and demonstrated passion for computer science. The same year she was also awarded the "Richard E. Merwin" award by the IEEE organization for demonstrating outstanding involvement in IEEE and excellence in academic achievement. Dr. Bojic continued her post-doctoral research at the MIT Senseable City Lab where she joined in 2014 as a Fulbright scholar. After one year at MIT, she moved to Singapore where now she is a senior postdoc working at Campus for Research Excellence and Technological Enterprise, Singapore-MIT Alliance for Research and Technology.

Tutorial-3
Biometrics Authentication – An Insight

Speaker:

Chetana Hedge, Ph.D.
Associate Professor, RNS Institute of Technology, India

Abstract:

In this computer-driven era, identity theft and the loss or disclosure of data and related intellectual property are growing problems. Biometrics is automated method of recognizing a person based on a physiological or behavioral characteristic. Biometric-based solutions are able to provide for confidential financial transactions and personal data privacy. The need for biometrics can be found in federal, state and local governments, in the military, and in commercial applications. Development of effective authentication algorithms on novel biometric traits like signature (with visual cryptographic techniques), hand vein-patterns, Electrocardiogram (ECG), Finger Knuckle Print (FKP) etc. will support the security system of various organizations. The tutorial is aimed at explaining and demonstrating various such algorithms.

Brief biography:

Prof. Chetana Hegde received B.Sc. from Karnataka University Dharwad, India with 1st Rank and two gold medals. She has done Masters in Computer Applications from Karnataka University Dharwad, India with 5th Rank. She did M Phil in Computer Science from Madurai Kamaraj University and PhD in the area of Biometrics from Bangalore University, India. She is a Senior Member of IEEE, Treasurer of WIE Affinity group of IEEE Bangalore Section and Associate Professor at RNS Institute of Technology, Bangalore, India.

Prof. Chetana Hegde has published 24 research papers in peer reviewed conferences and refereed journals like IEEE, Springer Verlag and ACM. She was supported by Government of India under Young Scientist Scheme in the form of travel grant. She bagged the best paper award at IEEE TENCON 2011 held at Bali, Indonesia. She has authored four books in the subjects like Object Oriented Programming with C++, C#.NET etc. She was an invited author to contribute a chapter to a book entitled "Multibiometrics Systems: Modern Perspectives to Identity Verification", published by LAMBERT Academic Publishing, Germany. As a passionate teacher for programming languages, she has guided more than 50 post graduate students for their project works. She has been awarded with a Best Teacher Award from the Institution.

Workshop

Human Machine Interface: Hand Gesture Recognition in Navigational Platform for Rehabilitation of People with Mobility Issues

Speaker:

Rajesh Kannan Megalingam, Ph.D.,
Director, Humanitarian Technology (HuT) Labs,
Asst. Professor, Dept. of ECE, Amrita School of Engineering, Amrita Vishwa Vidyapeetham University, India

Abstract:

Appropriate assistive technologies can have a significant impact on the level of independence of people with disabilities. Powered wheelchair is one such technology where these users feel very comfortable to navigate the environment being seated. The research work proposed is to ease the lives of those among us who are unfortunate enough to have lost the ability to move their limbs due Stroke, significant amount of paralysis in the regions below their neck (SCI - Spinal Cord Injury), old age and other disabilities (SSEP). Such physically challenged find extremely difficult for locomotion, so they depend upon various assistive aids. The most common choice for them is the use of seated wheeled navigation systems for indoor navigation. Although today various types of wheeled navigation systems, particularly powered wheelchairs, are available in the industry, there is a limit in the number of designs with features that suits for people who fall in the above category. As such they lack specific features and control methods to be used in the rehabilitation process of these people. In this workshop the participants are introduced to various hand gesture recognition methods in use, those used to interface with wheelchair control particularly Joystick control as the HMI and how it helps rehabilitation. As a tested HMI, the hand gesture recognition method developed at the Humanitarian Technology (HuT) Labs of Amrita Vishwa Vidyapeetham University, Amritapuri Campus, Kerala, India, will be discussed in detail. A novel and simple hand gesture recognition method (Patent Pending) using IR sensors, low cost control device called 'gpaD' - Gesture Pad, the system design, implementation, the response time calculations of the system, the success rate in hand gesture recognition, performance evaluation with stroke and SCI patients - all will be part of the discussion. Some of the possible future hand gesture control methods are included as well. At the end, a short video of the working model will also be presented.

Brief biography:

Dr. Rajesh Kannan Megalingam is the Director of HuT (Humanitarian Technology) Labs and Asst. Professor at ECE Dept., Amrita Vishwa Vidyapeetham University, Amritapuri Campus, India, which is the number one private university in India. He completed his undergraduate in Engineering from College of Engineering, Anna University, Chennai in 1997 and masters and PhD at Amrita Vishwa Vidyapeetham University in 2010 and 2015 respectively. His research areas include Embedded Systems, Robotics, Low Power VLSI, and Healthcare. He has seven and half years of work experience and more than eleven years of research experience. He has worked as VLSI Design and Verification Engineer at various companies like STMicro Electronics, In silicon Incorporation etc. in Bay Area, California, USA, for six years. He has published more than 80 research papers at various international conferences, journals, and book chapters. He has won several awards including the Outstanding Branch Counselor and Advisor award from IEEE, NJ, USA, Outstanding Branch Counselor Award from IEEE Kerala Section, and the Award of Excellence from Amrita University, the highest award by the university.

Industrial Panel: Invited Talk - 1
IAS Chapters and Membership Overview – Products and Services

Speaker:

Dr. Peter Magyar,
Fellow of IEEE,
Chair, IAS Chapters and Membership Department (CMD)

Brief Biography:

Dr. Peter Magyar (IEEE M´91, SM´04, F´07) received the Dipl. eng. and the Dr. tech. degrees from the Budapest University of Technology, Hungary, in 1967 and 1975, respectively. From 1967 to 1991, he was with the Department of Automation of the same university as an assistant professor and a research associate. From 1982, he led the Laboratory of Microprocessor Controlled Drives of the same department. The profile of the laboratory was education and industrial research and development in the field of digitally controlled power electronics systems. Dr. Magyar has been author and co-author technical papers and books and filed more than 30 patents. His research interest focused on control and mathematical modelling of electrical drives and power converters.

In 1981, he was recipient of the Alexander von Humboldt fellowship, Bonn, Germany, and spent a research year at the Braunschweig University of Technology, Germany. From 1991 to 2003, he was head of development power electronics and drives with Hanning-Works and with D-Tech Ltd., both Germany. Currently, he is retired from Hella KGaA Hueck&Co., Germany, where he was with the Advanced Development Department from 2004 to 2009. His working field has been control of electrical drives, car steering control and automatic car parking manoeuvre systems. He is working as consultant in the field of electric cars and electrical drives. He has been expert evaluator of the European Commission (2003, 2010-).

Dr. Magyar has been member of the Hungarian Association of Electrical Engineering (1964-) and of the IEEE Societies CS, IA, IE, PEL (1992-) and PE (2008-) as well as the IAS Technical Committees Industrial Drives (2003-) and Industrial Power Converter (2005-). He is recipient of the IAS Distinguished Service Award 2006, and has been elected to the grade of IEEE Fellow for contributions to digital control of electrical drive systems (2007).

Dr. Magyar has been IEEE volunteer in various positions. *In the Germany Section*, he was secretary (1998-2000), vice chair (2001-2002) and chair (2003-2004) of the IAS/PELS/IES German Chapter, chapter coordinator (2005-2010) and nominations and appointments officer (2007-2012) of the Section's Executive Committee. *In the R8 Committee*, he was Division II representative (2007-2008) and chair (2009-2010) of the R8 Chapter Coordination Subcommittee. *At IEEE TAB*, he was member (2010) of the IEEE TAB Nominations & Appointments Committee. *In the IA-Society*, he was IAS chapters area chair R8 East & South (2005-2008), member of the IAS Executive Board as member-at-large (2005) and chair of the IAS Inter Society Cooperation Committee (2006-2008). Currently, he has been chair (2009 -) of the IAS Chapters and Membership Development (CMD) Department (http://ias.ieee.org/chapters-a-membership.html) and IAS liaison (2011-) of the R8 Chapter Coordination Subcommittee.

His IEEE volunteer working field covers the chapter and member activity of IAS in general, especially leading 8 CMD committees related to conference support, chapter development and promotion, membership development and member promotion for ~12,500 members, 142 section chapters and 120 student branch chapters.

Industrial Panel: Invited Talk - 2
Motor Drives for High Performance Applications

Speaker:

Mohammad S. Islam, Ph.D.
Chief Scientist at Halla Mechatronics in Bay City, Michigan

Abstract:

Several high performance motor drive applications, requires the motor to produce smooth torque with very stringent torque ripple and acoustic noise requirements. This seminar will be presenting various motor drives considered for high performance applications where low torque ripple and low acoustic noise are required with particular emphasize on permanent magnet synchronous motors (PMSM). The seminar will discuss the factors influencing the harmonic content of the induced voltage, effect of slot/pole combination, winding distribution and magnetic saturation for PM brushless motors. Design considerations including FE modeling will be presented to minimize cogging torque and the harmonic contents in the back-emf, thus reducing the overall torque ripple for PM brushless machines. Acoustic noise performance for various slot/pole combinations of PMSMs will also be discussed.

Brief biography:

Mohammad S. Islam received the B.Sc. and the M.Sc. degrees from Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh, and the Ph.D. degree from the University of Akron, Ohio, USA, all in electrical engineering, in 1994, 1996, and 2001 respectively.

Currently, Dr. Islam is working as Chief Scientist at Halla Mechatronics in Bay City, Michigan where he is responsible for motors, sensors, actuators and EMC/EMI related issues for automotive applications. From 1994 to 1996, he was with the electrical and electronic engineering department of BUET as a lecturer. From 2001 to 2013 he had been working for Delphi Steering/GM/Nexteer Automotive in Saginaw, Michigan as staff research engineer at the Innovation Center.

Dr. Islam is widely known in the automotive industry for the development of innovative, low-cost sensors and actuators, particularly torque and position sensors, steering actuators and permanent-magnet (PM) brushless motors. Since their inception, the sensors and motors have been produced in the millions by many automotive OEMs worldwide such as GM, FORD, BMW, FIAT, OPEL etc. He has been issued 24 US patents with several more pending, has published 17 IEEE journal and 26 conference papers, 1 book chapter which will have a long-lasting impact on technical advancements in the field of electric machines, sensors and actuators for automotive applications and beyond.

Dr. Islam is currently serving as the vice chair of transportation systems committee and the chair of awards department at IEEE IAS. Recently, the Institute of Electrical and Electronics Engineers (IEEE) announced the elevation of Dr. Mohammad Islam as a Fellow of IEEE effective January 1, 2016 with the citation "*for development of electromagnetic sensors and actuators for automotive applications*"

Industrial Panel: Invited Talk - 3
Current Scenario of Power Industries in Bangladesh

Speaker:

Md. Rabiul Alam
CEO and Director, Energypac Engineering Ltd.
Chairman, Energypac Power Generation Ltd.

Abstract:

The total installed power capacity of Bangladesh has increased many folds in the last half a decade from 7119 MW in October 2011 to 11,877MW in September 2015. Mr. Rabiul Alam, as the head of the leading manufacturer of power products and power systems, weighs in on what this exponentional growth of the power and energy sector means for the power equipment industry in Bangladesh, and the ability of local industries to serve the growing demands of this sector.

Brief biography:

Mr. Rabiul Alam, is one of the founding directors of Energypac, the country leader in providing end-to-end power solutions for over three decades. Mr. Alam is widely regarded as one of the pioneers of the power industry in Bangladesh and has devoted his career to the advancement of this sector. He holds the position of Chairman of Energypac Power Generation Ltd., and CEO and Director at Energypac Engineering Ltd as well as occupying various directorial positions in Energypac Agro Ltd., Energypac Electronics Ltd., Energypac Power Systems Ltd., and Energypac Infrastructure & Development Ltd., Tec Advantage Ltd. and Chartered Life Insurance Company Ltd. amongst others. Mr. Alam is the President of the Transformers Manufacturers Associations of Bangladesh. He has also been involved with IEEE Bangladesh Section since its founding and has served as part of its executive committee for several terms during this time.