



11th IEEE International Conference on Advanced Networks and Telecommunications Systems

IEEE ANTS Women in Engineering (WIE) Mini Conference

Date: 18th December 2017



“WiN with WiT”

(Women in Networking with Women in Telecommunications)

MESSAGE FROM WIE CO-CHAIRS



A warm welcome to our dear participants to the 11th IEEE ANTS International Conference. WiE initiative was conceived as a one day mini-conference as part of the decenary celebration of IEEE ANTS, last year (2016) with the aim to encourage women engineers to showcase their technical acumen. This year WiE mini-conference is on Dec 18th, on the second day of IEEE ANTS. The Program Schedule is enclosed. We would be delighted to have you all join us for the plethora of events we have lined up for you – keynotes, invited talks as well as paper presentations. Let us leverage on this forum opened for the second time in IEEE ANTS and celebrate Women in Engineering!

Dr. Mydhili Nair, MS Ramaiah Institute of Technology, Bengaluru, India



It is our honour and pleasure to welcome all delegates to the 11th IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS 2017), the WiE Track- a one day Mini-conference on 18th December 2017 organised by C. V. Raman College of Engineering, Bhubaneswar, India. This is a unique part of this conference that provides a platform for women engineers to showcase their expertise. This year we have keynote speakers from CISCO, Springer, TCS, and other invited talks both from academia and industry. I hope WiE track will provide a good forum for the women engineers to explore their knowledge who are working in the field of advanced networks and telecommunications systems.

Dr. Chhabi Rani Panigrahi, Central University of Rajasthan, India



It is our great pleasure to welcome you here in Bhubaneswar, the “Temple City”, securing first position amongst Smart Cities in India to participate in the 11th IEEE ANTS an International Conference from 17-20 December 2017 organised by C. V. Raman College of Engineering, Bhubaneswar, Odisha, India. We have done our best to offer an exciting scientific programme, composed of state-of-the-art plenary lectures and abstract-driven sessions presenting the latest research with the theme “Communications for Smart City”, and to stimulate discussions as well as educational exchanges. WiE initiative was conceived as a one day mini-conference as part of the decade celebration of IEEE ANTS, last year (2016) with the aim to showcase the technical expertise of the women engineers in the field. This year WiE mini-conference is on Dec 18th, on the second day of IEEE ANTS. It is one place where you can make direct contact with your peers, key players and check out what other researchers are doing. Take an active part in ANTS 2017 and play your role in defining the future of Indian “Smart City”, showcasing your innovative services to a large target audience and celebrate Women in Engineering!!

Dr. Tripti Swarnkar, Siksha ‘O’ Anusandhan University, Faculty of Engineering(ITER), Bhubaneswar, India



It is my immense pleasure to welcome you to the IEEE ANTS Women in Engineering (WiE) Mini Conference as a part of 11th IEEE International Conference on ANTS to be held on December 18th in Bhubaneswar, India. This mini conference aims to create a platform to exchange new ideas and discuss the latest research solutions for Women Engineers in the field of Computer Networks and Telecommunications. I hope it enables exchange of knowledge and is productive as well as enjoyable for all the attendees.

Dr. Chetna Singhal, Indian Institute of Technology (IIT) Kharagpur, India



Mini-Conference
"WiN with WiT"



Sl#	Time	Venue	Event
1	11:30am- 12:00pm	Auditorium 4 (11:30am to 13:00pm)	Swati Meherishi, Executive Editor-Applied Science and Engineering, Springer India <i>How to write for and get published in international scientific journals</i>
2	12:00 to 12:30pm		Pallavi Srinivasa, Director, Product Management and Technical Marketing, CISCO <i>Connecting citizens through National Broadband Network</i>
3	12:30 to 13:00pm		Banani Swain, Program Manager, IUX, TCS <i>A Platform Based Approach for developing Smart City Solutions</i>
4	13:00-14:00pm	Lunch Break	
5	14:00- 14:30pm	Auditorium 4 (14:00pm to 15:30pm)	Dr. Iti Saha Misra, Professor, Department of ETCE, Jadavpur University, IEEE ComSoc Chairperson, Kolkata Chapter <i>Cognitive Radio: A Prospect for 5G Communication and IOT Services</i>
6	14:30- 14:45pm		Dr. Arpita Thakre, Assistant Professor, Amrita School of Engineering, Amrita Vishwa Vidyapeetham (University), Bangalore <i>Spatial Modulation, an Overview</i>
7	14:45- 15:00pm		Dr. Basabi Chakraborty, Professor, Iwate Prefectural University, Japan <i>Discovering Social Needs through Social Network Data Mining</i>
8	15:00- 15:15pm		Dr. Tripti Swarnkar, Associate Professor, Siksha 'O' Anusandhan University, Faculty of Engineering(ITER), Bhubaneswar, India <i>Smarter Healthcare in Smart City</i>
9	15:15- 15:30pm		Dr. Mydhili K Nair, Professor, Dept. of Information Science & Engg, MS Ramaiah Institute of Technology, Bangalore <i>Role of Interdisciplinary Research in India's Smart-City Initiative</i>

WiE Technical Paper Presentation Session : Parallel Track 1

12	16:00-16:15pm		Strategic Decision for Crowd-Sensing: An approach based on Markov Decision Process <i>Arpita Ray, Chandreyee Chowdhury and Sarbani Roy (Jadavpur University, India)</i>
13	16:15-16:30pm		Dynamic Traffic Congestion Detection by K-means clustering on Arduino Interface <i>Urmila Bhanja (IGIT, Sarang, India); Sudipta Mahapatra (Indian Institute Technology, Kharagpur, India); Rajesh Kumar, Amlan Routray and Shivashis Behura (IGIT, India)</i>
14	16:30-16:45pm		Secure Key-exchange for Implantable Sensors using Inductive Coupling <i>Priti Kumari (IIITB, India); Tricha Anjali (International Institute of Information Technology - Bangalore, India)</i>
15	16:45-17:00pm		Towards Policy-driven Power Management for Cloud Computing <i>Varsha Ram Thayal (Amrita University, India); Sriram Sankaran (Amrita University, India)</i>
16	17:00-17:15pm		A Survey of Scheduling Policies in Software Defined Networks <i>Anuradha Banerjee (Kalyani Govt. Engg. College, India); Flavio Esposito (Saint Louis University, USA)</i>
17	17:15-17:30pm		FSNRP: Fuzzy-controlled Priority Scheduling of Non-Real Time Data Packets in Mobile Ad-hoc Networks <i>Anuradha Banerjee (Kalyani Govt. Engg. College, India); Abu Sufian (University of Gour Banga, India)</i>

WiE Technical Paper Presentation Session : Parallel Track 2

18	16:00-16:15pm		Performance Analysis of Integrated SAC-OCDMA and OFDM Technique over FSO <i>Urmila Bhanja (IGIT, Sarang, India); Arpita Khuntia and Swati Alamasety (Indira Gandhi Institute of Technology, India)</i>
19	16:15-16:30pm		Adaptive Freezing of Backoff in LAA-LTE <i>NagaPriyanka Parvathareddy (College of Engineering, Pune, India); Varada Potnis Kulkarni (College of Engineering Pune, India)</i>
20	16:30-16:45pm		Polling vs No Polling: QoS driven performance analysis of IEEE 802.15.6 for varying data rate in WBAN <i>Suparna Biswas, Rajni Gupta and Gitanjali Pradhan (Maulana Abul Kalam Azad University of Technology WB, India)</i>

21	16:45-17:00pm		EECP: An Energy Efficient Coverage Preserving Protocol for Heterogeneous Sensor Networks <i>Sonam Maurya (PDPM-Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India); Vinod Kumar Jain (PDPM Indian Institute of Information Technology, Design and Manufacturing Jabalpur, India)</i>
22	17:00-17:15pm		A Finite Jitter Buffer Model for Time Division Multiplexing Over Packet Networks <i>Usha Rani Seshasayee (Madanapalle Institute of Technology and Science, Andhra Pradesh, India.); Manivasakan R (IIT, Chennai, India)</i>
23	17:15-17:30pm		Secrecy Performance Analysis of Relay Selection in Adaptive DF Relaying Network with Active Adversary <i>Sarbani Ghose (Indian Statistical Institute Kolkata, India); Sushmita Ruj (Indian Statistical Institute, Kolkata, India)</i>

KEY NOTE SPEAKER - 1



Name: Swati Meherishi, Executive Editor-Applied Science and Engineering, Springer India

Talk Title: How to write for and get published in international scientific journals

Timings: 11:40am-12:10pm

Venue: C.V. Raman College of Engineering, Auditorium 4

Biography:

Swati Meherishi is Executive Editor of Applied Sciences and Engineering at Springer. She has an extensive experience publishing engineering content across two continents. She holds degrees in Physics and Philosophy from the prestigious St. Stephen's College in Delhi. Prior to Springer, Swati has managed key engineering textbook portfolios in both India and the United States. At Springer, Swati manages a growing portfolio of journals, including both Springer-owned and key academic society journals, such as Journal of the Indian Institute of Science, INAE Letters, Transportation in Developing Economies, Indian Geotechnical Journal, Transactions of the Indian Institute of Metals, and the Institution of Engineers (India) journals. She has successfully negotiated and launched new journal partnerships with several institutions of repute, including the Indian National Academy of Engineering, the Indian Institute of Science, and the Indian Institute of Packaging.

Swati also publishes books across all domains of engineering and applied science. She has successfully launched several new book series, including prestigious partnership series with the Infosys Science Foundation, Indian Institute of Metals, and IIT Kanpur. Her primary aims at Springer are to grow Springer's Engineering and Applied Sciences Portfolio in key interdisciplinary areas and to generate institutional and corporate partnerships. While her authors and editors hail from top institutes and corporate centers all around the globe, Swati's focus remains to garner quality content from top engineering schools and corporate R&D groups across India in form of both books and journals. Swati is a member of the Materials Research Society (MRS), Institute of Electrical and Electronics Engineers (IEEE), and the American Institute of Chemical Engineers (AIChE). In her free time she teaches technical communications courses to graduate students at the IITs.

WEBPAGE:

<http://www.springer.com/engineering/engineering+contacts?SGWID=0-40513-19-1435347-0>

LINKEDIN : <https://www.linkedin.com/in/swatimeherishi>

Abstract:

The face of scientific publishing is changing at a very fast pace. Transitions from print to electronic, onset of open access publishing and change in research demographics by geography, are a few of the issues being talked about in the publishing world today. How do these changes affect researchers? How can young researchers leverage these transitions to make their work visible? What is Open Access Publishing? What are citations and how are they calculated? These are just a few questions that Springer's Author Workshops address. In this particular Author Workshop Lecture, Swati Meherishi will speak briefly about the transitions in and the needs of the publishing world and how young researchers need to prepare for it. This author workshop has been devised specifically as a resource for teaching non-native English-speaking researchers, particularly young scientists how to achieve publication success. Some of the key topics covered during this presentation are:

1. Writing for International Journals: Language, Style and Accuracy
2. Selecting a Journal for your Manuscript
3. Peer Review and you
4. Plagiarism, Citations, Open Access: The Buzzwords of publishing
5. Predatory journals and publishers and how to spot them

KEY NOTE SPEAKER -2



Name: Pallavi Srinivasa, Director, Product Management and Technical Marketing, CISCO

Talk Title: : Connecting citizens through National Broadband Network

Timings: 12:10pm-12:35pm

Venue: C.V. Raman College of Engineering, Auditorium 4

Abstract:

BharathNet or National Broadband Network is an initiative to get every citizen in the country online. As you can imagine, benefits are innumerable with realization of this dream. As with any big dream and initiative, challenges are also huge. With timelines fast approaching, government, partners, policy makers come together to address this in a creative fashion. This session provides a high level view of what it takes to build such an antharjaal in our magnificent country. This sessions outlines obstacles faced so far, technologies evaluated, funding model and the deployments across various states.

Biography:

Pallavi Srinivasa is an industry veteran with over 16 years at Cisco in various leadership roles in areas of product management, technical marketing and sales. Pallavi has also spent a significant amount of time focused on driving business growth in India in the enterprise and data center portfolio in a quota carrying overlay sales capacity. Most recently, Pallavi has been leading the Enterprise Switching Portfolio. Outside of Cisco, Pallavi is also very active in mentoring STEM programs, driving diversity of leadership in technology companies and volunteering with NASSCOM on various programs. She holds a Master of Science degree from Wright State University in Ohio.

LINKEDIN: www.linkedin.com/in/pallavisrinivasa

KEY NOTE SPEAKER -3



Name: Banani Swain, Program Manager, IUX, TCS

Talk Title: A Platform Based Approach for Developing Smart City Solutions

Timings: 12:35pm-13:00pm

Venue: C.V. Raman College of Engineering, Auditorium 4

Abstract:

As the world's urban population continues to grow at an unprecedented rate, the need for intelligent, sustainable cities has never been greater. City leaders are challenged to address urbanization and deliver superior services across many sectors to citizens while managing limited resources. They must leverage data from multiple sources and build ecosystems made up of citizens, urban planners, civic developers, and merchants to co-create services that promote innovation, sustainable living, and economic development.

TCS Intelligent Urban Exchange Solution (IUX)—an integrated, cloud-based solution—helps partners and city leaders launch smart city initiatives quickly and cost-effectively with the IUX Platform, which can extend easily and economically across multiple city domains—i.e. transport, water, energy—for integrated city initiatives and decisions.

Biography:

Banani Swain is currently the Program Manager for Product Intelligent Urban Exchange (IUX) at Tata Consultancy Services and is based out of Bhubaneswar (India). The IUX where Banani is actively involved provides a platform to rapidly develop smart city application modules. Along with platform, IUX also provides pre-build applications for Smart Transport, Smart Water and Smart Energy. Her current role involves: Product planning and monitoring for IUX, Product Functional Consulting, Engineering Release of IUX, Adaption of industry standards to IUX and Adaption of recent technology trends for IUX. Banani holds MCA from Utkal University (2002), Bhubaneswar and has 14+ years of IT experience. She holds TOGAF9 and INS certification. For the last 3 years Banani is associated with IUX engineering. Prior to IUX she has successfully lead the delivery of multiple projects in various domains across multiple geographies.

INVITED TALK - 1



Name: Dr. Iti Saha Misra, Professor, Department of ETCE, Jadavpur University, IEEE ComSoc Chairperson, Kolkata Chapter

Talk Title: Cognitive Radio: A Prospect for 5G Communication and IOT Services

Timings: 14:00-14:30 | **Venue:** C.V. Raman College of Engineering, Auditorium 4

Abstract:

The mobile technology has undergone several generations since inception with target towards Fifth Generation (5G) to achieve more throughput with much lower latency to support real time mobile communication and control, including Internet of Things (IOT) with enhanced QoS. The mobile and internet technologies have now become the part and parcel of our daily life. Apart from usual voice communication people are getting acquainted with online entertainment, money transfer, payments, booking of air as well as railway tickets, hotel booking, transfer of medical information including imaging – all are part of ‘digital media’. However, all these applications demand high data rate and bandwidth to establish satisfactory QoS to the end users. The 5G cellular networks is the promise to support new such services and business by 2020. 5G is considered to be the convergence of internet services and IoT enabled, with legacy mobile networking standards over heterogeneous networks (HetNets), requiring high connectivity speeds and connecting billions of machines, thus creating severe resource limitations. Though ubiquitous nature of cellular networks make them the preferred choice for access networks, but lack of communication resources is the problem. Here lies the significance of using Cognitive Radio (CR) in some way. Cost of leasing the spectrum is expected to be much lower than the cost of purchasing a licensed band, offering a natural solution to cope up the exploding, random, and diverse mobile data traffic through CR. The 5G CR network would use innovative software defined radio techniques, interference tolerant, dynamic, self-organized network for interference cancellation, spectrum sharing and the power management with ultimate gain of the spectrum utilization. Heterogeneous cell structures such as Macro and Femto in 5G networks would enable femto users for better indoor coverage in which femto cells may be CR enabled in either underlay (cooperative) or overlay (non-cooperative) modes. Further, Femto users can communicate through mm-wave communication that increases the overall data rate and the system capacity. Macro BS may communicate with the Femto BS using licensed radio resources. In a cooperative cognitive cellular network, cognitive relay may

deploy for coverage and capacity enhancement in which cognitive radio may communicate with base station through licensed radio resource providing local coverage using cognitive radio.

Recent advances in the design of Internet of Things (IoT) technologies allow the Wireless Body Area Network (WBAN) to be connected over Internet for continuous ubiquitous monitoring of patients data. Remote Health monitoring has been regarded as one of the emerging applications of Machine-to-Machine (M2M) communications enabling ubiquitous and autonomous connectivity and monitoring between the sensors, Body Network Controller and the remote-end requiring minimal or no human intervention. However, conventional cellular M2M networks include spectrum scarcity or resource constraints with the huge demand of IoT connectivity. An alternative solution is the Cognitive M2M (M2M communications employing CR technology), which enhances efficiency, flexibility, and reliability of M2M communications. Cognitive M2M is expected to be indispensable in the era of IoT and needs research focus for seamless integration between WBAN and CR backhaul. This lecture will consider the possible path of using CR technology in 5G networks and IOT enabled 5G services, particularly in health care system.

Biography:

Dr. Iti Saha Misra is the immediate past Head and now a professor in the Department of Electronics and Telecommunication Engineering, Jadavpur University, Kolkata. She is the Senior Member of IEEE, Present ComSoc Chair, Kolkata Chapter and the Founder Chair of Women in Engineering Affinity Group, IEEE Kolkata Section. Under her leadership, WIE AG, Kolkata Section won the first prize in 2007 and IEEE ComSoc Kolkata Chapter won the 2015 and 2017 Chapter Achievement Awards. She is the recipient of prestigious Career award for Young teachers by All India Council for Technical Education (AICTE), IETE Gowri memorial award in 2007 in the best paper category for the topic of “4G networks: Migration to the Future”, co –author of several best paper awards in the wireless communication domain. She has supervised 19 doctoral research students (in which 9 already awarded, 2 under completion) and 50 theses at master’s level in the field of Mobile Communication and Antennas. Under her supervision, two PhD students have received the Young Scientist Award from IEEE URSI International Radio Conference out of their research presentation in the year 2014 and 2015 consecutively. She has authored more than 210 research papers in refereed Journals and International Conferences and has filed several patents. She is the author of widely acclaimed textbook on “Wireless Communication and Networks: 3G and Beyond” published by McGraw Hill. She has supervised many projects from Govt. of India like, DST FIST, DST PURSE, UGC-UPE, AICTE etc. Her current research interests are in the areas of VoIP, Cognitive Radio Networks, Low Cost and Energy Efficient IoT solutions, Mobility Management, Wireless Body Area Networks, Call Admission control and Packet Scheduling, Smart Antenna System etc.

INVITED TALK - 2



Name: Dr. Basabi Chakraborty, Professor, Iwate Prefectural University, Japan

Talk Title: **Discovering Social Needs through Social Network Data Mining**

Timings: 14:30-14:45 | **Venue:** C.V. Raman College of Engineering, Auditorium 4

Abstract: With the rapid growth of Internet, Information and Communication Technologies various web based social networks are emerging at a fast pace. People interact with each other through online social networks and their decision making in every sphere of life is influenced by those interactions. The vast amount of data available in online social media provides tremendous challenges to researchers and analysts, who are trying to gain insights into human interaction and collective behavior. Efficient mining and analysis of online social data can provide assistance to people in different social needs like crisis management, reputation analysis, customer profiling and product survey, thereby leading to new applications related to economy, marketing, education, business or medical science. In this talk, I would like to present our research works on extracting important topics encompassing social needs and change of topics over time in online social media like twitter, blog and video sharing websites by using data mining techniques and how the extracted knowledge can be used for fulfillment of society's needs. Specifically I would like to present the results of our work after the Great East Japan Earthquake as a case study.

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. Currently she is serving as Professor and head of Pattern Recognition and Machine Learning laboratory. Her main research interests are in the area of Pattern Recognition, Machine Learning, Soft Computing Techniques, Biometrics, Data Mining and Online Social Media Mining. She has authored more than 180 research papers in International Journals and Conferences. She is a senior member of IEEE, member of ACM, Japanese Neural Network Society (JNNS), Japanese Society of Artificial Intelligence (JSAI), and Executive committee member of ISAJ (Indian Scientists Association in Japan). She served as the chair of IEEE JC WIE (Women in Engineering) during 2010-2011. Currently she is founding chair of IEEE WIE Sendai section.

INVITED TALK - 3



Name: Dr.Arpita Thakre, Assistant Professor, Amrita School of Engineering, Amrita Vishwa Vidyapeetham (University), Bangalore

Talk Title: Spatial Modulation, an Overview

Timings: 14:45-15:00 | **Venue:** C.V. Raman College of Engineering, Auditorium 4

Abstract:

Multiple Input Multiple Output (MIMO) techniques have been used in various wireless communication standards as it provides increased data transmission rate and better reliability. MIMO system in fact increases the number of radio frequency (RF) chains, thereby increasing the cost and overall power consumption. Mesleh et. al. proposed the concept of spatial modulation for the first time where the number of RF chains will be only one irrespective of the number of transmit antenna elements. In other words, symbols will be transmitted from only one antenna at a given time. The user is free to connect the single RF chain to any one of the transmit antenna elements.

Researchers have further extended the above described idea of spatial modulation from one antenna to multiple active antennas by employing more than one RF chains at the transmitter. The above technique also known as generalized spatial modulation gives rise to higher transmit data rate provided different symbols are transmitted from the active antennas at a given time and calls for reduced switching speed of the switches connected between the RF chains and the antenna elements, although at a cost of increased power consumption, and higher detection complexity at the receiver. The idea of spatial modulation was next extended to multicarrier communication system. Over the last couple of years investigation into performance of spatial modulation in mmwave frequency bands is going on. This very short presentation will touch upon the research work done in this area till date and the reasons why this modulation technique will be incorporated into 5th Generation wireless standards.

Biography:

Arpita Thakre did her PhD from Indian Institute of Technology, Madras. She had completed the Bachelor of Technology and Master of Technology degrees from the Institute of Radiophysics and Electronics, Kolkata, India, both with a major in communications engineering. Since January 2016, she has been working as Assistant Professor at Amrita Vishwa Vidyapeetham (University), Bangalore, where she leads a team of engineers who are working on transceiver design for next generation wireless systems. She has worked for Ikanos Communications (now Qualcomm), Hellosoft (now Imagination Technologies), and Orca Radio Systems (now Imagination Technologies), developing firmware for VDSL chipset, WLAN chipset, and RF front end chipset. She has research contribution to IEEE 802.16 TGm. She was a visiting researcher with the Ilmenau University of Technology, Germany, during 2008–2009. She has more than 5 years of teaching experience at postgraduate and undergraduate engineering level.

INVITED TALK - 4



Name: Dr. Tripti Swarnkar, Associate Professor, Siksha 'O' Anusandhan University, Faculty of Engineering(ITER), Bhubaneswar, India

Talk Title: Smarter Healthcare in Smart City

Timings: 15:00-15:15 | **Venue:** C.V. Raman College of Engineering, Auditorium 4

Abstract:

Smart cities hold the promise to potentially make urban areas more efficient, more secure, and even more health conscious? Of course, the ultimate goal of any smart city is to improve urban infrastructures while minimizing costs, foster innovation in different industries, and improve the quality of life for its citizens. But, can smart cities actually improve our health? To find out, we start with answer to question: how can Machine learning, and Bioinformatics enable us to address this area and what are the business implications of these technologies and advancements? The closer we get to creating smart cities, the more we discover that the possibilities are endless, and will have a direct bearing on individual health and well-being – in ways we can only imagine today. Smart healthcare uses the latest mobile and digital technologies to make advances in eHealth and mHealth systems while also driving the growth of intelligent and connected medical devices. Smart is supporting a shift from a focus on cure towards a broader view of wellness management and healthy living.

Biography:

Tripti Swarnkar did her PhD from Indian Institute of Technology, Kharagpur. She had completed the Masters in Computer Application from NIT Raipur and Master of Technology in Computer Science from the Utkal University, Bhubaneswar, India. She has an academic experience of more than 18 years. Currently she is working as Associate Professor at Siksha 'O' Anusandhan deemed to be University Bhubaneswar. Her research is focused on understanding the implicit information from various biological omic data and leveraging machine learning algorithms for gene selection. Currently, my research interest includes Machine Learning, Deep Learning, Data Mining, Computational Biology and Medical Image Analysis. Her aspiration is to work at the interface of the multidisciplinary fields of classical biology, statistics, mathematics, and computer science, or at least be able to converse effectively with others that hail from these backgrounds. She has authored many book chapters & Scopus indexed research papers in reputed publishing avenues and has been active in organizing international conferences of repute, workshops, schools, chairing sessions and give invited talks.

INVITED TALK - 5



Name: Dr.Mydhili K Nair, Professor, Dept. of Information Science & Engg., M S Ramaiah Institute of Technology, Bangalore

Talk Title: Role of Interdisciplinary research in Smart Cities Initiative (covers Indian Context)

Timings: 15:15-15:30 | **Venue:** C.V. Raman College of Engineering, Auditorium 4

Abstract:

'Smart city' the buzz-word in India today, requires collaborative efforts between government, practitioners, industry researchers and most importantly, the city's residents. The Smart-City initiative aim is to create a sustainable and resilient infrastructure aiming to provide high quality services for transport, infrastructure, water, electricity, education, health-care etc for residents. The ISO 37120 working group defines a 'Smart-City' as a standard facilitating the application of Information & Communication Technology (ICT) such as the internet of things, cloud computing, big data and space/geographical information integration, to facilitate the planning, construction, management and smart services of cities. The goal of this talk is to focus on the research aspects in the ICT domains listed above, involved in providing these services. The talk focuses mainly on the research in the Data Science realm, in making "sense" out of the tsunami of data collected from disparate engineering systems deployed in the smart-city, such as civil, mechanical, electrical to name a few. Interesting case-studies in both Indian and Global contexts is presented.

Biography:

Dr.Mydhili K Nair is working as a Professor in MS Ramaiah Institute of Technology, Bangalore, since 2004. She has a mixed bag of academic as well as Industrial experience both spanning close to a decade each. In the IT Industry, she has adorned various roles ranging from Technical Lead to Project Manager in different IT companies. She has won the prestigious IBM Faculty Award in the year 2011 for her collaborative research association with IBM. She has authored many book chapters & Scopus indexed research papers in reputed publishing avenues such as Springer, CRC Press, IEEE etc. She has been active in IEEE Women in Engineering forums in organizing international conferences of repute, chairing sessions and give invited talks. She & her students have won many project competitions & best paper awards at State & National level. She is currently doing a project for developing teaching-learning Apps for differently abled school children under a funding from Corporate Social Responsibility.

PAPER PRESENTATIONS – Track 1

Timing: 16:00 pm to 17:30pm, Venue: C.V. Raman College of Engineering, Auditorium 4

Paper #1 Title: Strategic Decision for Crowd-Sensing: An approach based on Markov Decision Process

Authors: Arpita Ray, Jadavpur University, India; Chandreyee Chowdhury, Jadavpur University, India ; Sarbani Roy, Jadavpur University, India.

Timings: 16:00 pm to 16:15pm

Abstract: With the surging of smartphone sensing and wireless networking, Mobile Crowd Sensing (MCS) has become a promising paradigm for cross-space and large scale sensing. In the smart city context, MCS can be extremely useful in pulling crowd data for better monitoring resource demand and planning. Since these devices are portable it is carried by almost every citizen thus making it ubiquitous. However, portability comes at the cost of limited energy consumption. Thus, the problem is that, how frequently a smartphone would lend itself for crowd-sensing while striking a balance between energy and incentive. In order to solve this problem, we propose a Markov decision process formulation of the problem and solve it to identify an optimal strategy for crowd-sensing depending on remaining energy, recharging probability and current load. The proposed approach is implemented in R and extensively evaluated for different scenarios.

Paper #2 Title: Dynamic Traffic Congestion Detection by K-means clustering on Arduino Interface

Authors: Urmila Bhanja, IGIT, Sarang, India; Sudipta Mahapatra, Indian Institute Technology, Kharagpur, India, Rajesh Kumar IGIT, Amlan Routray, IGIT, India, Shivashis Behura, IGIT, India.

Timings: 16:15 pm to 16:30pm

Abstract: Vehicular traffic congestion poses a serious challenge to green environment by contributing to air pollution, noise pollution, and unnecessary fuel consumption. This paper aims to meet one of the requirements of a smart city that detects the traffic congestion in an area and diverts the traffic on an alternate route in vehicular adhoc network (VANET). VANET is a medium of wireless communication among vehicular commuters, which enables them to intimate their instantaneous physical characteristics such as speed, brake frequency, rain, fog, acceleration, position to surrounding vehicles within a periphery so as to determine the levels of congestion and find suitable ways to divert the traffic. The dynamic nature of vehicle nodes makes the topology unpredictable, which is constantly monitored using vehicular adhoc network (VANET). In this work, four different physical attributes such as rain or fog, speed and brake frequency are considered for traffic congestion detection in VANET. Furthermore, an integration of fuzzy inference rule based system (FRBS) and K-means clustering technique is explored to detect the traffic congestion on an Arduino platform under a dynamic traffic environment. This paper presents a detailed description regarding the co-ordination between vehicular units and a web server, which acts as a cloud database that preserves data for future use.

Paper # 3 Title: Secure Key-exchange for Implantable Sensors using Inductive Coupling

Authors: Priti Kumari, IITB, India; Tricha Anjali, IIT - Bangalore, India

Timings: 16:30 pm to 16:45 pm

Abstract: The usage of implantable sensors is imperative in Body Sensor Network. The challenges associated with its security are open research problems. Implantable sensors need a set of secret keys to communicate with other sensors or entities. Secret key generation and subsequent key exchange with other sensors are significant power consuming tasks. Therefore, we propose pre-distribution of keys. The drawbacks of a pre-distribution based method like higher memory consumption and difficulties in key refreshment have been overcome in this paper. The key generation process has been shifted from implantable sensor to an external device. An external device is paired with sensor through inductive coupling and is used for powering the sensor and keys transfer. A variant of Diffie-Hellman key exchange with physiological values is used to facilitate secure transfer of keys.

Paper #4 Title: Towards Policy-driven Power Management for Cloud Computing

Authors: Varsha Ram Thayal, Amrita University, India; Sriram Sankaran, Amrita University, India

Timings: 16:45 pm to 17:00pm

Abstract: Cloud computing enables users to rent computing resources on-demand towards meeting the needs of diverse applications. However, scaling of resources may incur significant impact on performance and power consumption which are the two key concerns for cloud service providers. The major goal of cloud providers is to develop policies for balancing the conflicting objectives of maximizing performance and minimizing energy consumption. Towards this goal, we analyze the impact of scale-up and scale-out techniques for varying cloud workloads through an OpenStack implementation. Our analysis reveals that these techniques vary with the nature of applications that run on the cloud as a result of which policies need to be developed on a per-application basis. We develop a threshold-based policy which determines the optimal trade-off depending on the application profile. Our proposed policy is generic and can be applied to other workloads thus facilitating efficient management of resources.

Paper #5 Title: A Survey of Scheduling Policies in Software Defined Networks

Authors: Anuradha Banerjee, Kalyani Govt. Engg. College, India; Flavio Esposito, Saint Louis University, USA

Timings: 17:00 pm to 17:15 pm

Abstract: In the present era of Software Defined networks (SDNs), multi-policy resource management is extensively used to deliver ready-to-use media-optimized applications. Switches, ports etc. resources are allocated to different flows based on priority. Priority can be either externally set or computed depending upon various factors like flow package size, priority set by the user (if any), age in the queue (time period for which the process has been waiting in the queue) etc. This facilitates high speed communication under large scale distribution, efficiently manages the network bandwidth, and makes the resources available on demand while ensuring their efficient utilization. Keeping in mind the heterogeneity of network resources (differences in capacity of handling workload, cost, energy consumption etc.) & exponential distribution of flows granularity, a significant number of scheduling strategies has evolved in the literature of SDN. This article is dedicated to the discussion of those strategies along with their advantages and disadvantages. To the best of authors' knowledge this is the first article to focus on particularly scheduling strategies in SDN.

Paper #6 Title: FSNRP: Fuzzy-controlled Priority Scheduling of Non-Real Time Data Packets in Mobile Ad-hoc Networks

Authors: Anuradha Banerjee, Kalyani Govt. Engg. College, India; Abu Sufian, University of Gour Banga, India

Timings: 17:15 pm to 17:30pm

Abstract: Mobile ad hoc networks (MANETs) is an infrastructure less networks where topology is very dynamic and nodes are energy constrained. Therefore, scheduling for data packets transfer is very important. We can classify all the data packets into two categories - real time and non-real time. Scheduling of non-real time data packets should be different to real time data packet. Here timely delivery is not an important criterion to be met. The main intention here is to reduce the number of route request messages, as much as possible, through the scheduling policy. Therefore, high priorities are given to those packets which are travelling along fragile paths compared to those traveling along the stable paths. Moreover, when a communication session is on the verge of completion, its packets should be forwarded urgently. This scheduling algorithm FSNRP is designed to considering all these factors. The performance improvement it produces is very significant compared to other scheduling protocols.

PAPER PRESENTATIONS – Track 2

Timing: 16:00 pm to 17:30pm, Venue:

Paper #7 Title: Performance Analysis of Integrated SAC-OCDMA and OFDM Technique over FSO

Authors: Urmila Bhanja IGIT, Sarang, India; Arpita Khuntia, Indira Gandhi Institute of Technology, India; Swati Alamasety, Indira Gandhi Institute of Technology, India

Timings: 16:00 pm to 16:15pm

Abstract: Recently, the free space optical communication (FSO) is gaining popularity because of its high data rate, license free spectrum, less power. The major drawbacks of FSO are absorption, scattering and atmospheric turbulence that affect the performance of FSO in terms of bit error rate (BER) and hence, limits the transmission distance. In this paper, novel integrated spectral amplitude coding optical code division multiple access (SAC-OCDMA) code is proposed referred in this work as pulse transposition-zero cross correlation (PT-ZCC) code. Orthogonal Frequency Division Multiplexing (OFDM) is of prime significance these days in long-haul communication systems because of its immunity to multipath fading, higher bandwidth proficiency, and its flexibility to interference. Therefore, the proposed PT-ZCC code is furthermore, integrated with the OFDM technique so as to improve the performance of the FSO system in terms of BER. In this work, the proposed PT-ZCC code is implemented over an integrated SAC-OCDMA and OFDM technique over FSO communication and is tested under several weather conditions. The proposed integrated scheme is evaluated for different data rates and different number of active users. The proposed work is validated using Optisystem version 14.

Paper #8 Title: Adaptive Freezing of Backoff in LAA-LTE

Authors: NagaPriyanka Parvathareddy College of Engineering, Pune, India, Varada Potnis Kulkarni, College of Engineering Pune, India

Timings: 16:30 pm to 16:45 pm

Abstract: The rapid increase in cellular data with the use of smart devices creates the demand for more licensed spectrum. Extending the carrier aggregation (CA) technique of long term evolution (LTE) to unlicensed band is considered as one of the promising solutions. The major concern is to attain the fair coexistence with the technologies that operate in these bands. In this paper, at first we have analyzed the effect of LTE on the performance of WiFi with listen before talk (LBT) coexistence mechanism. An LBT scheme with adaptable freezing time of backoff count based on negative acknowledgments (NACKs) is proposed which gives a substantial increase in throughput of both LTE and WiFi as compared to the LBT scheme. The proposed scheme is simulated for low, medium and high spatial density scenarios. It is seen to provide better throughput in the medium and the high dense networks while found to be not necessary for the low dense networks.

Paper #9 Title: Polling vs No Polling: QoS driven performance analysis of IEEE 802.15.6 for varying data rate in WBAN

Authors: Suparna Biswas, Maulana Abul Kalam Azad University of Technology WB, India; Rajni Gupta, Maulana Abul Kalam Azad University of Technology WB, India; Gitanjali Pradhan, Maulana Abul Kalam Azad University of Technology WB, India

Timings: 16:45 pm to 17:00pm

Abstract: This work presents an evaluation of IEEE 802.15.6 standard using CSMA/CA with polling in the considering the priority in terms of the different contention window length for heterogeneous data traffic in health care monitoring. Data delivery time is crucial for timely assistance needed by the patient during emergency and threshold set for latency in medical application is 250 ms. Simulation has been done using Castalia 3.3 and OMNeT++ to analyse QoS parameters e.g. latency, energy consumption, packet received per node etc. for varying size, rate and priority of medical data traffic. The simulation results show that the increase in the slot length from 2 to 15 doubles the energy consumption. During emergency when the packet rate increases then $\approx 83\%$ packets received by contention with polling at 100 packets/second/node for different priorities and slot lengths in compare to $\approx 20\%$ packets received by contention without polling within the desired time limit for medical application.

Paper #10 Title: EECP: An Energy Efficient Coverage Preserving Protocol for Heterogeneous Sensor Networks

Authors: Sonam Maurya, PDPM-Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India; Vinod Kumar Jain, PDPM Indian Institute of Information Technology, Design and Manufacturing Jabalpur, India

Timings: 16:45 pm to 17:00pm

Abstract: Wireless sensor networks (WSNs) are deployed to monitor the environmental conditions of a specific area. In many applications, sensors are required to ensure the proper coverage of entire network area for longer duration. The fuzzy based energy efficient sensor network protocol (FB-EESNP) was developed to provide efficient coverage to entire network area by deploying sensors into various specified regions. The region-wise random node deployment strategy of FB-EESNP ensures efficient coverage as compared to the random node deployment over the entire network field. However, only the node deployment strategy is not sufficient to provide coverage for longer period of time. So in this paper, we propose an energy efficient coverage preserving (EECP) protocol which prolongs the coverage lifespan of the heterogeneous sensor network. We present a novel cluster head selection mechanism to preserve the coverage of

various points of interest (POIs) which needs to be monitored continuously. The EECF protocol also proposes an improved hybrid routing concept to achieve better network lifespan by minimizing intra-cluster communication cost of cluster member nodes. The simulation results show that the proposed EECF protocol enhances the coverage and network lifespan both by 98.32% and 42.27% respectively as compared to FB-EESNP.

Paper #11 Title: A Finite Jitter Buffer Model for Time Division Multiplexing Over Packet Networks

Authors: Usha Rani Seshasayee, Madanapalle Institute of Technology and Science, Andhra Pradesh, India; Manivasakan R IIT, Chennai, India

Timings: 17:00 pm to 17:15 pm

Abstract: Jitter buffer at the receiver of a Time Division Multiplexing over packet network is modelled as a M/G/1/K queue with a vacation for the first packet arriving at an empty queue. Subsequent packets are served at a service time which is constant. The parameters of the queue considered are the update probability, buffer size and delay of the first packet arriving at the empty queue. A similar queue model is used for application layer jitter control in case of VoIP, in terms of Mean Opinion Score. Whereas this work involves the analysis of such a queue for its different performance measures such as mean waiting time, variance of the inter-departure times and probability of loss of packets in the queue for layer-2 jitter control. The measures are computed numerically to gain insight into the performance of the jitter buffer in controlling the jitter, while simultaneously keeping the delay suffered by the packet in the queue minimum. The third performance measure, the loss probability is also introduced in the optimization problem and the queue is analyzed for a suitable operating point in terms of the queueing parameters to suit its application as a receiver jitter buffer in a TDM over packet network.

Paper #12 Title: Secrecy Performance Analysis of Relay Selection in Adaptive DF Relaying Network with Active

Adversary

Authors: Sarbani Ghose, Indian Statistical Institute Kolkata, India; Sushmita Ruj, Indian Statistical Institute, Kolkata, India

Timings: 17:15 pm to 17:30pm

Abstract: In this paper, we derive and compare the performance of relay selection strategies presence of an active adversary under a cooperative setting. The system consists of a source, a destination, multiple decode-and-forward relays and an active eavesdropper. These DF relays correctly decode source message, if their signal-to-noise ratio is above a certain threshold. The channels experience independent but not identical Rayleigh fading. We assume both source and eavesdropper can exploit direct and relaying channel. Two relay selection schemes are performed by the eavesdropper, which is assumed to be a part of the system and active. A conventional all-performing relays (using maximal ratio combining) scheme is compared with the above mentioned schemes. We obtain closed-form expressions for the secrecy outage probability of these three strategies. An asymptotic analysis is presented only when relay selection is performed by the eavesdropper. From numerical results, it is observed that relay selection performed by the active eavesdropper proves to be the worst from the perspective of legitimate receiver. Also restriction on either of the two hops results in flooring of secrecy performance.

