

10th IEEE International Conference on Advanced Networks and Telecommunications Systems

6-9 NOVEMBER 2016 – Indian Institute of Science, BANGALORE, INDIA



IEEE ANTS Women in Engineering (WIE) Mini Conference

Date: 8th November 2016



“WiN with WiT”

MESSAGE FROM WIE CO-CHAIRS



I am very glad to be a part of organizing committee of WIE Mini Conference which we are conducting for the first time under Tenth IEEE ANTS Conference at IISc, Bangalore. This conference mainly aims to encourage women researchers to present their findings and to build career path in the fields of Networks and Telecommunication. I wish this conference a grand success.

Dr. Deepa Shenoy, UVCE, Bengaluru, India



A warm welcome to our dear participants to the Tenth IEEE ANTS International Conference. As part of this decennary celebration, we have introduced a mini-conference for one day encouraging Women in Engineering (WIE), to showcase their technical acumen. The broad theme for this mini-conference is **"WiN with WiT"** (Women in Networking with Women in Telecommunications). This is on Nov 8th. 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, workshops, panel discussions as well as paper presentations. Let us leverage on this forum opened for the first time in IEEE ANTS and celebrate Women in Engineering!

Dr. Mydhili Nair, MSRIT, Bengaluru, India



It is a pleasure to welcome you to the 10th IEEE ANTS International Conference from 6-9 Nov 2016 in Bangalore, India. ANTS-2016 is very special to me, since for the first time WIE Mini conference is conceptualized as part of the conference. We have designed the WIE Mini Conferences to include Keynotes, two workshops: **"Transform your thinking"** & **"Think Design & Double U LeAP"** for participants from Academia & industry respectively and a panel discussion on **"Growing the Tech Career Ladder"** along with parallel paper presentation sessions. I hope you will find the conference productive, informative, and enjoyable. Before I close, I'd like to thank each of you for attending the conference and bringing your expertise to the gathering. Wishing ANTS-2016 a huge success.

Dr. Sujatha DN, BMSCE, Bengaluru, India



It is my great pleasure to welcome all the distinguished scientists and engineers attending the IEEE ANTS Women in Engineering (WiE) Mini Conference. The objective of WiE is to provide a multi-discipline forum for women researchers and technologists in the fields of networks and telecommunication technologies to present new ideas and contributions in the form of technical papers panel discussions on applications in the ever-growing area of wireless communications. I would like to take this opportunity to express my gratitude to all members of the International and National Advisory Committee, whose able guidance and suggestions are invaluable to the success of the conference. Finally, I would like also to express my sincere thanks to all speakers, session chairs, authors and attendees both coming from abroad and domestics for their active participation and contributions which will make the conference successful and rewarding.

Dr. Sakshi Kaushal, UIET, Panjab, India



The WIE Mini Conference at the 10th IEEE ANTS Conference is aimed at encouraging women researchers from various fields. The focus is help them to build their career in the fields of Networks and Telecommunication through various workshops by eminent women in technology. I extend a warm welcome to everyone to be a part of this conference and hope that you would take back home something valuable.

Dr. Pushpa C N, UVCE, Bengaluru, India



It is my immense pleasure to welcome all of you to IEEE ANTS Women in Engineering (WiE) Mini Conference as a part of 10th IEEE International Conference on ANTS to be held on 8th November in Bangalore India. The main objective of this mini conference is to create a platform to exchange new ideas and discuss the challenges for Women Engineers in the field of Computer Networks and Telecommunications. I greatly hope that this conference will bring huge success in achieving exchange of knowledge, will be productive and enjoyable to all attendees from inside and outside the country. I take this opportunity to thank all the committee members for their hard work in organizing this grand event.

Dr. Basabi C, Iwate Prefectural University, Japan



Mini-Conference "WiN with WiT"



PROGRAM
SCHEDULE

Sl#	Time	Venue	Event
1	09:00-09:10	J N Tata Auditorium	Inauguration & Welcome
2	09:10-09:30		Key Note Address by Swati Kamat , Sr. Vice President - Technology, Airtel Talk Title: Telecom in India – Next Five Years
3	09:30-10:00		Key Note Address by Tulika Pandey , Scientist 'F' at Ministry of Electronics & Information Technology, Govt. of India Talk Title: Women in Science, Technology, Engineering & Mathematics
4	10:00-10:30		Key Note Address by Pallavi Srinivasa , Director, Product Management and Technical Marketing, CISCO Talk Title: Software Defined Networking
5	10:30-11:00	Tea Break	
6	10:30-13:00	Join Main Conference for <ul style="list-style-type: none"> > KEYNOTES: "Sensors for IoT" & "Narrow Band IoT" > PANEL – "IoT Experiences from Early Deployments" 	
7	13:00-14:00	Lunch Break	
8	14:00-15:30	Room A	WIE Workshop for Academia: Design Thinking Title: Transform your thinking – Think Design Kajal Arunkumar , Offering Program Manager – Transformational Change & Innovation, Innovation & Advanced Technology, Intuit
9	14:00-15:30	Room B	WIE Workshop for Industry: Leadership Skills Title: Double U LeAP Yeshasvini Ramaswamy , Managing Director, e2e People Practices Pvt. Ltd.
10	15:30-16:00	Tea Break	
11	16:00-18:00	Room A	PANEL DISCUSSION: "Career Growth for Women Professionals" Title: Growing the Tech Career Ladder Panelists: <ul style="list-style-type: none"> > Vidya Laxman– CIO, TESCO > Sushma C- Intuit > Vijaya K Matt – IBM Moderator: Yeshasvini

Invited Talk + WiE Technical Session : Parallel Track 1			
12	16:00-16:15	Room B	Invited Talk: Dr.Aparna C. Sheila-Vadde , Lead Engg, NDE Lab, GE Global Research, Bangalore Talk Title: Industrial IoT: Roadmap and Challenges
13	16:15-16:20		Q & A Session
14	16:20-16:40		Paper Presentation: "Implementation of MapReduce over structured Peer-to-Peer overlay of underutilized resources" Authors: Shashwati Banerjea; Mayank Pandey; Manoj Gore; Rishabh Dugar; Ashish Kumar(Motilal Nehru National Institute of Technology Allahabad, India)
15	16:40-16:45		Q & A Session
16	16:45-17:05		Paper Presentation: "SDN based Implementation of Publish/Subscribe Paradigm using OpenFlow Multicast" Authors: Misha Hungyo; (NOKIA, India) & Mayank Pandey(Motilal Nehru National Institute of Technology Allahabad, India)
17	17:05-17:10		Q & A Session
18	17:10-17:30		Paper Presentation: "Opportunistic and Cooperative Hybrid Spectrum Access Protocol for Cognitive Radio Network" Authors: Shubha Sharma; (Nanyang Technological University, Singapore) & Vivek A Bohara; Mansi Peer(Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi)
19	17:30-17:35		Q & A Session
20	17:35-17:55		Paper Presentation: "Energy Consumption Evaluation and Analysis in 6LoWPAN using Real and Emulated Zolertia Z1 Motes" Authors: Shubhangi Kharche; Sanjay Pawar (Usha Mittal Institute of Technology SNDT, Mumbai, India)
21	17:55-18:00		Q & A Session
Invited Talk + WiE Technical Session : Parallel Track 2			
22	16:00-16:15		Invited Talk: Dr.Sakshi Kaushal , Associate Professor, Computer Science and Engineering, U.I.E.T, Panjab University, Chandigarh Talk Title: Traffic Engineering & Analysis of VOIP-based Unified Telecom Systems
23	16:15-16:20		Q & A Session
24	16:20-16:40		Paper Presentation: "Optimal Power Allocation for Cognitive Radio Multicast Networks under Primary Users' Outage Loss Constraint" Authors: Sangeeta Bhattacharjee; Tamaghna Acharya; (Indian Institute of Engineering Science and Technology, Shibpur, India) & Uma Bhattacharya(Bengal Engineering

		Room C	Science University, Shibpur)
25	16:40-16:45		Q & A Session
26	16:45-17:05		Paper Presentation: "Cloud based Content Delivery Network using Genetic Optimization Algorithm for Storage Cost" Authors: Sajitha Banu(National Institute of Technology, India), Dr. S R Balasundaram (NIT, Trichy, India)
27	17:05-17:10		Q & A Session
28	17:10-17:30		Paper Presentation: "A Transfer Learning Framework for Energy Efficient Wi-Fi Networks and Performance Analysis Using Real Data" Authors: Shreyata Sharma; Sumit Jagdish Darak; Anand Srivastava; (Indraprastha Institute of Information Technology Delhi, India) & Honggang Zhang (Zhejiang University, China)
29	17:30-17:35		Q & A Session
30	17:35-17:55		Paper Presentation: "An Efficient Mobile Sink Routing in Wireless Sensor Network using Dynamic Steiner Tree" Authors: Meera G S (University of Kerala); Vaibhav Gupta (BITS Pilani, KK Birla Goa Campus, India); Priya Sekhar(University of Kerala, India).; Sreejith V; Anupama K. R (BITS Pilani, KK Birla Goa Campus, India)
31	17:55-18:00		Q & A Session

KEY NOTE SPEAKER - 1



Name: Swati Kamat, Sr. Vice President - Technology, Airtel

Talk Title: Telecom in India – Next Five Years

Timings: 09:10-09:30 | J N Tata Auditorium

Biography: Swati Kamat is a senior telecom management professional with 28 years of rich experience in department of telecommunication and various private sector companies. She completed her B.E. in Electronics & Telecommunication in 1987 and joined as Indian Engineering Service Officer in Department of Telecommunication in 1989. She held important positions with **DOT** for 17 years and worked in Fixed line, Mobile Technologies & Administrative role in various locations across country. She won many accolades like Sanchar Seva Padak twice in her tenure with DOT. She also won Ms Engineer Award from Institute of Engineers Pune for exceptional work in field of Telecommunications. Swati joined Tech Mahindra in 2007 and started new practice in Network Services. She was responsible for bagging multi- year projects with Large Tier-1 Telco's in Canada, US & some European countries. Later, she moved to Airtel as Chief Technical Officer (**CTO**) – Kerala & Tamil Nadu and then to Bangalore as **CTO-Karnataka**. During her stint in Kerala, Tamil Nadu and Karnataka as **CTO**, the circles bagged the Best Circle Awards for technical achievement's, growth and success in Airtel. She also held **Global Delivery Head - Network Services** position during her short stint back in Tech Mahindra and travelled extensively across the globe. Presently, she is working as **Sr. Vice President** in Airtel and leading teams responsible of Planning, Deployment, Quality, and Operation for all telecom circles in the North & West Region. Last year Airtel rolled out 88,000 Multi Technology Cell Sites, which is the highest number across Globe by any operator in one year, after China Telecom. This increased foot print of all technologies across all circles and she was part of the leadership team who made it happen. She is passionate about diversity in Engineering & General Management and has been part of Leadership team responsible for diversity agenda across Tech Mahindra & Airtel.

KEY NOTE SPEAKER -2



Name: Tulika Pandey, Scientist 'F' at Ministry of Electronics & Information Technology, Govt. of India

Talk Title: Women in Science, Technology, Engineering & Mathematics

Timings: 09:30-10:00 | J N Tata Auditorium

Biography:

Ms. Tulika Pandey is an Electronics and Communications Engineer. She has been with the Government of India since 1992 and currently holds the position of Scientist 'F' with the Department of Electronics & Information Technology, Ministry of Communications & Information Technology, Government of India. She has been involved in implementation strategy and action plan formulations for wider reach of ICT facilitated benefits; Integration of appropriate technology interfaces between human and cyber world; Steering of Research and Development projects for development of contextual ICT technology, tool, applications and content. She has traversed through the path of Microelectronics development, E-Learning, Technology Development for Indian Languages, Digital Libraries, E-Infrastructure, Internet Governance and Convergence, Communications & Broadband Technologies in her 23 year stint with the Government of India.

Ms Pandey has co-authored research papers in the area of network engineering and several position papers and strategy papers for national policy formulations on Internet and ICT related areas. She has spearheaded the activities of Internationalization of Internet, Internet Proliferation and its last mile outreach within India. She has been representing the concerns of India and government in particular in the International and National forums of Internet Governance, Internationalization of Internet and Women in ICT.

Ms Pandey is a member of –

- IEEE Women in Engineering Society
- Standards for Telecom Equipments of the Telecom Engineering Centre (TEC, Dept. of Telecommunications, Govt. of India
- International Advisory Board of the International Conference on "COMmunication System & NETworkS (COMSNETS)".
- United Nation's 'Internet Governance Forum' and was instrumental in establishing the Indian Chapter of Internet Governance Forum (IIGF)
- Governmental Advisory Committee of 'Internet Corporation for Assigned Names and Numbers'.

Ms Pandey's current pursuit is harnessing the technologies of Internet of Things (IoT) and convergence of Cognitive Radio with IP for enhancing ubiquitous technology interventions in human life with minimal trespassing of security and privacy.

KEY NOTE SPEAKER -3



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

Talk Title: Software Defined Networking

Timings: 10:00-10:30 | J N Tata Auditorium

Abstract: Software Defined Networking entered our lives few years back. What is the initial thought process behind this? We don't hear much about it off late. Did it succeed and create any viable products or architectures in the industry? How has the industry transformed its view of Software Defined Networking from then to now? What do consumers of this technology have come to expect and accept? Let's uncover answers to all these questions along with what's available on the ground today that is as close to SDN as possible. After glancing through this, you will also figure out future possibilities in this ever changing domain and perhaps ways you can contribute to this world.

Biography:

Pallavi Srinivasa is a senior product manager with campus switching systems technologies group (CSSTG) focusing on campus-related activities for the Cisco Catalyst 6500 and 4500 Series platforms. Pallavi product manages the Supervisor 720, including the latest supervisor supporting virtual switching system. Recently, she has focused on network virtualization in the enterprise campus for the two platforms. She has been at Cisco for 8 years in various roles including technical marketing engineer and over 14 years of experience in Product Management, Marketing in the areas of Cloud Services, Data Center, and Campus Switching. She holds a Master of Science degree from Wright State University in Ohio.

WIE Workshop for Academia: Design Thinking



Nitin Kant

Senior Development Manager

Transformational Change & Innovation, Innovation & Advanced Technology, Intuit



Kajal Arukumar

Offering Program Manager

Talk Title: Workshop for Academia: Transform your thinking – Think Design

Timings: 14:00-15:30 | Room A

Abstract: Intuit is a well-known and widely documented example of a company, which successfully incorporated design thinking in its transition to a more customer-centric corporate culture. Design thinking's impact is perceptible throughout the organization. Design for Delight (D4D) is comprised of a set of methods and techniques that Intuit uses to get to delight and innovation. They're not tied to a project plan or any other process, which means you can use them at any time, depending on what you need to accomplish.

Biography:

Nitin is a Senior Development Manager at Intuit. He is leading Quickbooks Enterprise team. He has built a great credibility towards delivering solid outcomes for Intuit Finance team through great partnership with stakeholders. He is passionate about solving problems by leveraging his deep customer empathy. As an Innovation catalyst, he has helped teams to cultivate the mindset of "Innovation at Core". This enabled Intuit functional teams to improve their processes and better serve the employees. He has done Post Graduation in Information technology and B.E (Electronics and Telecommunication). He has a great penchant for adventure sports and music.

Kajal is currently, leading all of the Innovation and Unstructured Time programs at Intuit. Enabling and facilitating innovation and transformational change across Intuit on key initiatives and strategies that are services and technology driven. Helping develop innovation framework to drive experiential learning of key initiatives and strategies such as Strategic Capabilities and Network Effects Platform, NEXT program. In the past have helped develop framework and scalability on programs like Assessing for Awesome (hiring and talent processes), Style of Influence™(SOI), Customer Benefit (Customer Driven Innovation) and organization level events like Intuit Leadership Conference, CTOF and TechForum.

WIE Workshop for Industry: Leadership Skills



Name: Yeshasvini Ramaswamy, Managing Director, e2e People Practices Pvt. Ltd.

Title: Workshop for Industry: Double U LeAP

Timings: 14:00-15:30 | Room B

Abstract: *Despite years of advances in both legal and corporate policy, many qualified women don't get the jobs they want. Misperceptions, stereotypes and misplaced emotions on the part of either sex can still sabotage a woman's career hopes—unless she takes a more strategic approach to her career.*

The Double U LeAP session shows you how to strategically use your strengths and abilities—your competitive edge—while mastering your emotions in even the most unwelcoming atmosphere. You'll learn how to build a network of support, take smart risks and view competition in a more positive light. Discover how to conduct yourself in a manner that earns you respect, and pursue your goals with positive energy. Based on seven years of research on women as leaders and grounded in participants' own professional context, this program is a unique opportunity to build leadership capabilities and expand one's performance range. Through experiential learning, participants will gain powerful new techniques and practice them in real time. In turn, these techniques will help participants to dig deeper and understand themselves more fully, enabling them flourish at work and in life.

Specifically, successful participants will at the end of the session be able to:

- identify their core strengths and learn how to use them as leaders
- deepen their self-awareness to get the best out of every situation
- become more attuned to their energy levels and learn to recover
- analyze their professional relationships to support their personal vision
- tap into their fears to explore and overcome their personal limits

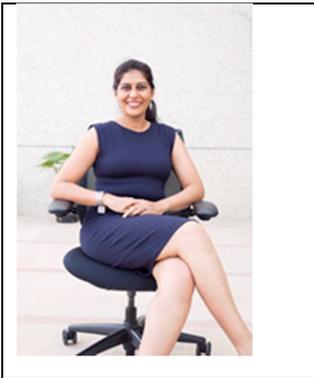
Biography:

Yeshasvini has a vast work experience spanning UK, US, Australia, Dubai and China with global Fortune 100 companies. She Co-created India's first student committed PG entrepreneurship program with guaranteed start-up funding and accelerated incubation efforts that saw 46 start-ups with a combined turnover of >\$ 22mn USD and creation of >2000 jobs. She is nominated by the US State Dept. to represent India among emerging 25 women leaders in the Most Powerful Women Program. She is contributes through roles in NASSCOM and CII & Serves as Global Advisor to I-create, a not for profit that helps the disadvantaged view entrepreneurship as a career option. I-create has accelerated rural entrepreneurship and supported 16,000 entrepreneurs. She also serves on the Board of Samatvam Trust that helps disadvantaged underprivileged children in diabetes care.

PANEL DISCUSSION

“Growing the Tech Career Ladder”

PANELISTS

		
Vidya Laxman CIO, TESCO	Rashmi Mohan Technologist, an engineer and a budding entrepreneur	Parul Jain Architect, Intuit



Moderator: Yeshasvini

Managing Director, e2e People Practices Pvt. Ltd.

Abstract:

The session will have the panelists share opportunities in tech roles in the industry, how to prepare for these tech roles, the challenges for growing your career in the tech space and how to overcome these challenges.

The session will further focus on the current gender diversity situation among technology companies in India and will address the issue of attraction, retention and advancement of women in the technical ladder. Questions for discussion will be

- What are the barriers to the retention and advancement of women in technology?
- How can companies secure their investments by retaining female technical talent across all levels in the company (entry to leadership positions)?

Profile of Vidya Laxman:

Vidya Laxman is Technology Director at Tesco Bengaluru. She is member of the Technology Management Group, in the core CSR committee and board of Tesco Bengaluru. She is currently heading the Global Data Warehouse and Analytics along with delivery of the customer journey across all channels. In her 18+ years of international career, she has worked in technology and market facing roles with both startups and global players. Her geographical diverse and rich experiences encompass incubating and growing global technology businesses and driving organizational change.

- Prior to Tesco Bengaluru, Vidya spent nearly 3 years as Chief Operating Officer (COO) for Thoughtworks Studios division, where she managed the global operations that included development, finance, human resources, public policy, and communications. She also supported marketing, and sales efforts in the local market. Earlier, she worked in companies like Sunguard, Wachovia Bank and Fidelity.
- Vidya holds a Bachelor's degree in Computer engineering from RVCE, Bangalore. She is very active in different bodies like National Association of Software and Services Companies (NASSCOM), American Chambers of Commerce, etc. She is on the advisory board of Anita Borg Institute (GraceHopper) – Women in technology. She is passionate about social causes and is actively engaged in her local community. Her other interests include long distance running and the highlight is completing OXFAM 100km and coming 3rd in the mixed group.

Profile of Rashmi Mohan

Rashmi Mohan is a technologist, an engineer and a budding entrepreneur. Until recently, she was a Sr. Engineering Manager at Yahoo Labs in Bangalore. She has spent 15+ years in various technical and management roles in the industry. She has a background in Front end engineering and led a group of scientists and engineers within Yahoo Labs. Her work involved working with researchers and applied scientists in building prototypes and proof of concepts of the most cutting edge ideas being developed in the Labs. She lives the journey of taking these ideas from research to product every day. Rashmi is particularly interested in the cause of promoting and encouraging women in technology to aspire and reach greater heights in their careers. She is the ACM India council secretary and is actively involved in the CS community. Rashmi has been associated with the Grace Hopper Conference in Bangalore for five years as a mentor, advisory committee member and founding member of the all women Hackathon. She has been leading the conference as a Program Chair for the past 2 years. Rashmi is also a mentor at the Oracle Startup Cloud Accelerator. She has a Bachelors degree in Computer Science from Santa Clara University.

Profile of Parul Jain

Parul is a seasoned Architect with over 16 years of experience in software industry. Parul has a passion to solve business problems that are mission critical and have a wide impact to society using technology. She has been

working in the Identity and Security domain for over a year now at Intuit, specializing in the Identity for Connected World. Prior to Intuit, Parul tried an entrepreneurial stint for about six months, an exciting journey for sure while building a platform for career prediction based on linked in and anonymous messaging for professionals on android. She holds great experience in advertising domain from her Yahoo days, where she lead multi-function teams with design and architecture of highly distributed, scalable and performant systems in the space of Search as well as Display Advertising and Cloud Platform. She hold a Master's degree in Comp. Sc. and Engg. from IIT Delhi. She is married to Rohit who is a co-founder at Pravega Ventures. Has two boys, Mrinal (11 yrs) and Pranjal (6 yrs), very demanding :) She is a fun loving person, like to travel to new places, is fond of trekking and outdoor activities, dwell into adventures whenever there is an opportunity. When she is not at work she helps her kids learn the art of problem solving using Scratch, Arduino, robotics etc. She banks on her experience to coach girls to pursue technology.

Moderator: Yeshasvini Ramaswamy, Managing Director, e2e People Practices Pvt. Ltd

Yeshasvini has a vast work experience spanning UK, US, Australia, Dubai and China with global Fortune 100 companies. She Co-created India's first student committed PG entrepreneurship program with guaranteed start-up funding and accelerated incubation efforts that saw 46 start-ups with a combined turnover of >\$ 22mn USD and creation of >2000 jobs. She is nominated by the US State Dept. to represent India among emerging 25 women leaders in the Most Powerful Women Program. She is contributes through roles in NASSCOM and CII & Serves as Global Advisor to I-create, a not for profit that helps the disadvantaged view entrepreneurship as a career option. I-create has accelerated rural entrepreneurship and supported 16,000 entrepreneurs. She also serves on the Board of Samatvam Trust that helps disadvantaged underprivileged children in diabetes care.

INVITED TALK - 1



Name: Dr. Aparna C. Sheila-Vadde, Lead Engg, NDE Lab, GE Global Research, Bangalore.

Talk Title: Industrial IoT (IIoT): Roadmap and Challenges

Timings: 16:00-16:15 | Room B

Abstract: Industrial IoT (IIoT) is the integration of composite physical machinery with industrial networks and data analytics solutions to increase operational efficiency and reduce costs. It includes advanced sensor technologies, machine-to-machine communication, real-time data analytics, and machine learning algorithms to enrich the decision-making capabilities of the industries. The driving philosophy behind the IIoT is that “smart machines” are better than humans at capturing and communicating data precisely and reliably. This data can enable companies to identify inefficiencies and problems earlier, saving time, money and supporting business intelligence efforts. This talk covers some of the work done at GE in the IIoT sector focusing on the benefits obtained in using advanced sensor technologies in Industrial IoT applications.

Biography:

Dr. Aparna C. Sheila-Vadde is a Lead Engineer at the NDE Lab in GE Global Research, Bangalore. She has been with GE for the last 10+ years and has worked on design and characterization of different electromagnetic sensors for various applications. Prior to GE, Aparna worked at Western Digital Corp and Read-Rite, in Fremont, CA, USA for 3.5 years on GMR sensor design for hard-drives. Aparna has a Ph.D in Electrical and Computer Engineering from Carnegie Mellon University, USA, MS in ECE from Indian Institute of Science and B.Tech in ECE from Kerala University.

Aparna led the Women’s Network of GE Global Research in 2011-2012 and was actively involved in organizing Women in Technology and Science Meet for Graduate Students and promoting Science and Engineering among Girl Students in high schools.

INVITED TALK - 2



Name: Dr.Sakshi Kaushal

Associate Professor, Computer Science and Engineering,
U.I.E.T, Panjab University, Chandigarh.

Talk Title: Traffic Engineering & Analysis of VOIP-based
Unified Telecom Systems

Timings: 16:00-16:15 | Room C

Abstract: Recent technology advances has brought evolved version of legacy networks with large number of features and higher scalability. Internet Protocol (IP) has been a strong enabler for this evolution and provides flexibility to network design for supporting wide range of user devices. In telecom, a number of applications on Voice, Video and Data based on IP have lead to convergence in communication domain and hence formed Unified IP based Communication (UC) platform. The national programme of Digital India has 9 pillars and one of which is to provide network access to all the citizens. Another programme 'Make in India' has given further thrust to the objective and challenges of developing technology and manufacturing network equipment within India. Although the technology and products are available from multi-national companies like Alcatel, CISCO, ZTE, etc but they are proprietary and quiet expensive. So, if we use open source technologies for telecom equipments like FreeSWITCH, Open SIP, Asterix, etc and develop solutions which are specific to India, then it will cut down cost for Indian consumers like Defense, Railways, etc. Voice traffic analysis is an important aspect of designing and operation of a switching system. It is important to compare VoIP traffic calculation methodology with traditional TDM based modeling and to show that Erlang-B model is applicable to VoIP. The methodology will be elaborated for traffic calculation methodology for calculating capacity of IP PBX system. Full capacity load of a sample hardware and software setup with FreeSwitch as IP PBX system with single server architecture will be tested with an emulator that also monitors VoIP quality and calculates jitter, packet loss, etc.

Biography: Sakshi Kausal received her PhD in Computer Science and Engineering from Thapar University Patiala, India in 2009. She has 14 years of research and teaching experience and is presently working as an Associate Professor at University Institute of Engineering and Technology, Panjab University, Chandigarh, India. Her research includes modeling and simulation, wireless networks, Information security, mobility in networks, and Cloud Computing, etc. and has published more than in 45 papers in refereed International Journals and Conferences. She has organized various academic and technical events.

PAPER PRESENTATIONS

Title: "Implementation of MapReduce over structured Peer-to-Peer overlay of underutilized resources"

Authors: Shashwati Banerjea; Mayank Pandey; Manoj Gore; Rishabh Dugar; Ashish Kumar (Motilal Nehru National Institute of Technology Allahabad, India)

Timings: 16:20-16:40 | Room B

Abstract:

The growth of data at an unprecedented rate poses challenge on its storage and analysis. To cope up with this, new machines are procured on a regular basis. On the other hand, a lot of computing resources in Institute labs, government offices etc. remain underutilized, since they are used for Internet and basic utilities. The aggregation of these underutilized resources can be more than handful to satisfy the computing needs of any large scale computation. This paper presents an approach of applying MapReduce framework on non-dedicated nodes. The target of this work is to efficiently use underutilized resources such as storage, processing power etc. on nodes to perform MapReduce applications. We have implemented a prototype of our model by forming a peer-to-peer (P2P) relationship among them and compared the performance with Hadoop, which is a popular large scale data processing framework under similar churn conditions.

Title: "SDN based Implementation of Publish/Subscribe Paradigm using OpenFlow Multicast"

Authors: Misha Hungyo; (NOKIA, India) & Mayank Pandey(Motilal Nehru National Institute of Technology Allahabad, India)

Timings: 16:45-17:05 | Room B

Abstract:

In the traditional Publish/Subscribe (Pub/Sub) paradigm, most of the responsibilities lie with the broker, thus making it burdened. It also takes a considerable amount of time to first route the publications and subscriptions towards the broker, and then to further route the notifications to the subscribers. This leads to delays in data delivery. Besides delay and bandwidth consumption, the number of flows installed on a Ternary Content-Addressable Memory(TCAM)switch is another important factor to be considered for better QoS (Quality of Service). Software Defined Networking(SDN)has evolved as a new networking paradigm, in which the data plane and the control plane decoupled from each other. This decoupling nature of SDN can be used to reduce the burden on the broker. In this work, we have proposed an SDN based implementation of multicast in Pub/Sub based networks to reduce delay, the false positive rates and the flow table size, thus improving the QoS. It also helps in reducing the extra cost involved in the traditional method of multicasting, wherein extra-multicast switches are employed and IPv6 multicast addresses are used.

Title: "Opportunistic and Cooperative Hybrid Spectrum Access Protocol for Cognitive Radio Network"

Authors: Shubha Sharma; (Nanyang Technological University, Singapore) & Vivek A Bohara; Mansi Peer (Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi)

Timings: 17:10-17:30 | Room B

Abstract:

This paper presents a hybrid opportunistic spectrum access (OSA) and cooperative spectrum sharing (CSS) protocol for cognitive radio networks. In the proposed protocol, secondary (i.e. cognitive) network (SN) switches its mode between OSA and CSS based on the state of primary network (PN). The activity status of PN is modeled as a two state discrete time Markov chain model in which steady state probabilities of PN are used to derive the outage probability of the hybrid system. Due to hybrid nature of the protocol, SN is always benefited since it can communicate either via OSA or CSS mode. In CSS mode, we analyze a two-phase hierarchical spectrum sharing protocol based on cooperative decode and forward relay transmission wherein it is assumed that the secondary system is equipped with multiple antennas. Closed form expressions for outage probability have been derived for both SN and PN. Through the theoretical and simulation results, the effect of network parameters, such as steady state probability of primary transmitter (PT), the distance between primary and secondary nodes, the transmit power at secondary transmitter (ST), has been shown on the performance of SN. The performance of the proposed scheme has also been validated by comparing it with conventional OSA. The numerical results show that the hybrid approach outperforms the conventional OSA.

Title: "Energy Consumption Evaluation and Analysis in 6LoWPAN using Real and Emulated Zolertia Z1 Motes"

Authors: Shubhangi Kharche; Sanjay Pawar (Usha Mittal Institute of Technology SNET)

Timings: 17:35-17:55 | Room B

Abstract:

In IPv6 Over Low Power Wireless Personal Area Networks (6LoWPAN) the network reliability, availability and lifespan depends on the energy consumed by the wireless sensor motes as well as the network as a whole. In order to improve the aforementioned parameters the energy consumption must be kept at minimum. The mote and network level energy consumption is evaluated, analyzed for real and emulated Zolertia Z1 motes so as to know the factors on which it depends. The mote level energy consumption is evaluated based on the amount of current drawn and the supply voltage for the time spent by the mote in processing, transmitting and receiving the packets. To ease the evaluation on per mote basis a small scale 6LoWPAN is considered. The network level energy consumption is evaluated based on the routing protocol overhead, the neighbor discovery protocol (NDP) overhead, the received signal strength indication (Received Signal Strength Indication), the positions of the motes, the percentage duty cycle and various states of motes like processing, receiving and transmitting. Three major observations are drawn from the experiments and simulations; First, maximum energy is consumed at the mote level in receiving state and found to be higher than that in transmitting and processing states on an average by 10.94 and 27.24 percent respectively. Second, energy consumed at the network level depends on the composite effect of the received signal strength, average overhead bytes in control as well as in data packets, the percentage duty cycle of the motes and activities carried

out by the motes in various states. Third, the data transmission efficiency of the motes depends on the received signal strengths.

Title: "Optimal Power Allocation for Cognitive Radio Multicast Networks under Primary Users' Outage Loss Constraint"

Authors: Sangeeta Bhattacharjee; Tamaghna Acharya; (Indian Institute of Engineering Science and Technology, Shibpur, India) & Uma Bhattacharya (Bengal Engineering & Science University, Shibpur)

Timings: 16:20-16:40 | Room C

Abstract:

In this paper, we consider an underlay cognitive radio (CR) multicast network where secondary users (SUs) coexist with primary users (PUs). The cognitive radio network (CRN) consists of a cognitive base station (CBS) and multiple multicast groups. Each multicast group comprises of a number of SUs and is served by the CBS using a common PU channel. Our objective is to minimize the aggregate group outage probability for the CR multicast network. To protect PUs' transmission, a probabilistic model of interference is considered unlike the traditional interference temperature constraint. In addition, an average transmit power constraint is imposed on CBS's transmission. The problem is formulated using constrained optimization framework and an optimal transmit power control policy is proposed. The power adaptation strategy clearly illustrates the dependence of CBS's transmission power on various system parameters including PUs' channel conditions and target rates, link interferences as well as multicast group target rates and SUs' channel conditions. Simulation results are presented to validate the proposed power allocation scheme.

Title: "Cloud based Content Delivery Network using Genetic Optimization Algorithm for Storage Cost"

Authors: Sajitha Banu (National Institute of Technology, India), Dr. S R Balasundaram

Timings: 16:45-17:05 | Room C

Abstract:

Use of cloud computing technology and its services have paved its way into many applications and this is also true in case of Content Delivery Networks. The storage services of cloud environment are replacing the traditional Content Delivery Networks for more reliability and easy availability of contents to users. Most research in Content Delivery Networks mainly focuses on delivering contents to the users with less latency and traffic cost. Apart from this the overall cost incurred for the content providers in cases of bandwidth and storage should also be taken into consideration. Most existing Content Delivery Networks focus only on the bandwidth and in some cases latency. In this paper a novel Content Delivery Model is proposed that makes use of a Genetic Optimization Algorithm (GOA) combined with an efficient storage model that can achieve better content placement and delivery in Cloud based Content Delivery Networks. The proposed approach updates itself dynamically to avoid unwanted use of storage that achieves a much better placement of contents thus reducing the storage cost.

Title: “A Transfer Learning Framework for Energy Efficient Wi-Fi Networks and Performance Analysis Using Real Data”

Authors: Shreyata Sharma; Sumit Jagdish Darak; Anand Srivastava; (Indraprastha Institute of Information Technology Delhi, India) & Honggang Zhang (College of Information Science and Electronic Engineering, Zhejiang University, China)

Timings: 17:10-17:30 | Room C

Abstract:

In the recent past, there has been an exponential increase in data intensive services over the communication networks. This trend would sustain in future communication networks as well, especially in the Wi-Fi networks. This could be attributed to rapid growth of business and institutional entities and the need for cellular data off-loading for which localized WiFi networks are preferred due to higher offered data rate. In such networks, a major portion of energy consumption occurs at the access network entities making energy efficient operation of WiFi access points (APs) extremely crucial. In this paper, an actor-critic (AC) reinforcement learning (RL) framework is designed to enable traffic based ON/OFF switching of APs in Wi-Fi network. Furthermore, previously estimated traffic statistics is exploited in future scenarios which speeds up the learning process and provide additional improvement in energy saving. The important feature of the present study is the validation of the proposed framework on real data collected from an institute’s Wi-Fi network. The simulation results for 20 APs of a Wi-Fi network shows that the proposed framework can lead to around 75% saving in energy consumption as compared to the case when AP switching is not considered.

Title: “An Efficient Mobile Sink Routing in Wireless Sensor Network using Dynamic Steiner Tree”

Authors: Meera G S (University of Kerala); Vaibhav Gupta (BITS Pilani, KK Birla Goa Campus, India); Priya Sekhar (University of Kerala, India); Sreejith V; Anupama K. R (BITS Pilani, KK Birla Goa Campus, India)

Timings: 17:35-17:55 | Room C

Abstract:

Sink mobility in WSN is considered to be a challenge for routing the data, as it creates rapid topological changes in the network. Most of the routing protocols available in the literature are prone to high control overhead and are less efficient. An elastic routing technique utilizing overhearing feature, is an efficient protocol with less control overhead for routing the data, from a single static source to a mobile sink. But, when there are multiple static sources, the delivery of data to the mobile sink pose huge delay and high traffic. Here we propose an efficient routing algorithm utilizing the feature of overhearing to route the packets from all the source nodes to the mobile sink. We use a modified version of iterative-1 Steiner tree algorithm with elastic routing, for finding the shortest path to the mobile destination, with minimum control packet overhead. Calculation of Steiner points is dynamic in nature, so as to adapt to the topological changes. The simulation results show that the proposed approach is better in-terms of data rate, energy efficiency and control overhead. Test-bed results indicate that the proposed approach can be used effectively in WSN, where topological changes are frequent.

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