Wireless Sensor Networks: *Network Architectures, Protocols and Applications*

(May 30th to June 8th 2016)

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Overview

Wireless sensor networks (WSNs) are special type of networks made up of a large number of tiny sensor nodes, presenting severe resource constraints, such as, energy, processing capacity and communication capability. The WSN is an emerging area with potential applications in environmental monitoring, surveillance, military, health and security, with research challenges in energy efficiency, network lifetime and network reliability, etc. Recently, sensing and communication technology such as Internet of Thing (IoT) Paradigm has been designed for heterogeneous services.

This course focuses on topics, such as, design of efficient protocols, algorithms and architectures in wireless sensor networks. The course content includes protocol design in MAC and network layer including clustering algorithms. Further, the course includes autonomic sensing and IoT paradigm. Design of secure protocols in heterogeneous sensor network will be one of the important aspects in this programme.

The primary objectives of the course are as follows:

i) Exposing participants to the fundamentals of next generation sensor network platforms and applications including ***cyber-physical systems***, ***healthcare***, ***smart city*** and ***Internet of Things(IoT).***
ii) Design of energy efficient MAC protocols for Wireless Sensor Networks in ***IoT environment***
iii) Development of ***routing*** and ***fusion algorithms*** for efficient dissemination of sensor data and service discovery in next generation networks.
iv) Hands-on-experience to sensor ***network simulators*** *(preferably, NS3 and QualNet)*.
v) Discussing the key research problems including ***autonomic sensing*** and ***secure protocol design***.

Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

Modules	**There are 9 modules in this course (all are compulsory): May 30 - June 08 2016** Number of participants for the course will be limited to (preferably) **Fifty.**
Credits	**2**
You Should Attend If…	▪ you are an engineer or research scientist interested in designing protocols in sensor network and sensing applications. ▪ you are a student or faculty from academic institution interested in learning how to do research on wireless sensor networks and state of art sensing paradigm.
Fees	The participation fees for taking the course is as follows: Participants from abroad : US $200 Participants from Industry /Consultancy firm : Rs. 8000/- Faculty (Internal & External) and scientists : Rs. 4000/- Students (with award of grade) : Rs. 2000/- Students (without award of grade) : Rs. 1000/- The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided accommodation on payment basis.

The Faculty

Sajal K. Das (Fellow IEEE) received the B.S. degree from Calcutta University, Kolkata, India, in 1983, the M.S. degree from the Indian Institute of Science, Bangalore, India, in 1984, and the Ph.D. degree from the University of Central Florida, Orlando, FL, USA, in 1988, all in computer science.
Prior to that, he was a Distinguished Scholar Professor of computer science and engineering and also the Founding Director of the Center for Research in Wireless Mobility and Networking (CReWMaN) at the University of Texas (UT) at Arlington, Arlington, TX, USA. He holds five US patents and coauthored three books: Smart Environments: Technology, Protocols, and Applications (Wiley, 2005); Mobile Agents in Distributed Computing and Networking (Wiley, 2012); and Handbook on Securing Cyber-Physical Critical Infrastructure: Foundations and Challenges (Morgan Kaufmann, 2012). His current research interests include wireless and sensor networks, mobile and pervasive computing, cyber-physical systems and smart environments, security and privacy, biological and social networks, applied graph theory, and game theory. He has published over 500 papers and 49 book chapters in these areas. Dr. Das serves as the founding Editor-in-Chief of Pervasive and Mobile Computing, and Associate Editor of the IEEE TRANSACTIONS ON MOBILE COMPUTING, Journal of Parallel and Distributed Computing, and Journal of Peer-to-Peer Networking. He is the founder of the IEEE WoWMoM symposium and co-founder of the IEEE PerCom and ICDCN conferences. He has served as General and Program Chair as well as Technical Program Committee member of numerous IEEE and ACM conferences. He is a recipient of the IEEE Computer Society Technical Achievement Award (2009) for pioneering contributions to sensor networks and mobile computing.

Rashmi Ranjan Rout (Member IEEE) received Ph.D. from Indian Institute of Technology Kharagpur, WB, India. During his PhD, he worked on network coding in sensor networks. He received the B.E. degree from F. M. University, Odisha, India and M. Tech degree from Motilal Nehru National Institute of Technology, Allahabad, India, both in Computer Science and Engineering.
He is working as an Assistant Professor, Computer Science and Engineering, National Institute of Technology, Warangal, AP, India since June 2012. His research interest includes network coding, data routing, wireless ad-hoc and sensor networks, delay-tolerant networks, P2P overlay networks, mobile computing. He has published several journals (including IEEE Trnansactions on Wireless Communications and IEEE sensors journals) and conference papers in the area of sensor networks and overlay networks. He is a member of IEEE, ACM and ISTE. He has been involved in reviewing process in various international journals including IEEE TWC, IET WSN, Adhoc Networks (Elsevier), IEEE Comm. letters, Journal of networks and computer applications (elsevier), IEEE Sensors journal. He has conducted faculty development programs at NIT Warangal in the area of Advanced Wireless Networks and Pervasive and Mobile computing. Currently he is working on Sensor networks, Service discovery in Internet of Things and Cloud.

Course Co-ordinator

Dr. Rashmi Ranjan Rout
Mobile: 08332969418
E-mail: rashrr@nitw.ac.in

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http://www.gian.iitkgp.ac.in