

GLOBAL INITIATIVE ON ACADEMIC NETWORK (GIAN)

Ministry of Human Resources Development
Government of India

A Two-week Course

On

Wireless Sensor Networks and Underlying Characteristics

14th December – 23rd December 2016



JNTUH College of Engineering Hyderabad
Kukatpally, Hyderabad – 500085
TELANGANA STATE

About GIAN:

Govt. of India approved a new program titled Global Initiative of Academic Networks (GIAN) in Higher Education aimed at tapping the talent pool of scientists and entrepreneurs, internationally to encourage their engagement with the institutes of Higher Education, viz., all IITs, IIMs, Central Universities, IISc Bangalore, IISERs, NITs and IIITs subsequently cover good State Universities where the spinoff is vast. The GIAN website may be visited for detailed information.

Overview

Wireless Sensor Network (WSN) is a wireless network formed by spatially distributed devices equipped with sensors to monitor physical or environmental conditions such as light, heat, pressure etc.,. WSN provides a virtual layer where physical world information can be captured by any computational system. So, WSN becomes a key technology for realizing vision of Internet of Things (IoT). Various characteristics of WSNs are covered as SNs have small local memory, processing of raw data and inclusion of wireless transceiver has made them versatile and useful in monitoring of an unattended area. Various underlying issues and associated parameters are studied in detail. As all WSN units get power from the battery, it is critical to conserve energy as much as possible. There are many civilian applications where access to the event area is possible and SNs can be placed at predefined locations. First topologies that are appropriate for these applications are defined and associated performance issues are characterized. There are many underlying issues that need careful considerations and this course provides an insight of various parameters that affect the performance and have long-lasting impact. Security considerations are also covered in this course to illustrate the balance between algorithmic complexity, power consumption and security requirements. Final comments about future research work are added to help audience think about potential open research areas.

Objectives:

The primary objectives of the course are as follows:

- Understanding Wireless technology and recent advances in Sensor Networks.
- Providing exposure to engineers and researchers from both industry and universities.
- Building confidence and capability amongst the participants in the applications of wireless technologies and techniques.
- Providing exposure to practical problems and their solutions, through case studies.
- Building adequate background by introducing recent but useful results in a simple and effective manner.

Benefits of Attending the Course:

Persons who have attended the course and followed the material should learn latest developments in wireless networks, and strengthening their skills in research and development in the area of Wireless Sensor Networks.

Who should attend:

This course is intended for faculty, researchers and students at all levels (Ph.D. scholars/ M.Tech./ B.Tech.) who want to learn state-of-the-art in Wireless Sensor Networks. Industry personnel involved in process control, automation, defense applications, unattended 24x7 monitoring, human health conditions **For the participation in the course, registration with GIAN is mandatory.**

Registration to the portal is one time affair and will be valid for lifetime of GIAN. Once registered in the portal, an applicant will be able to apply for any number of GIAN courses as and when necessary. One time Non-refundable fee of Rs. 500/- is to be charged for this service. For registration, the website is: www.gian.iitkgp.ac.in/GREGN/index

Number of participants for the course will be limited to fifty.

Course Fee:

The participation fees for taking the course are as follows:

Participants from abroad	: US \$500
Industry/ Research Organizations	: Rs.15000/-
Academic Institutions	: Rs.10000/-
Students	: Rs.2000/-
SC/ST students	: Rs.1000/-

There will be a concession of 50% of the fee for the faculty working in the constituent and affiliated colleges of JNTUH. The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility, Tea, Snacks, Lunch. The participants will be provided with accommodation on payment basis.

Important Dates:

Last date for receiving applications: ~~15-11-2016~~
10-12-2016

Course Dates 14th December – 23rd December 2016

Evaluation and Grading:

There will be evaluation at the end of each module on the understanding of the concepts by the participant made during the course. Based on the evaluations finally a letter grade will be awarded to the participant. A completion certificate shall also be issued.

The Guest Faculty:



Dharma P. Agrawal is the Ohio Board of Regents Distinguished Professor and the founding director for the Centre for Distributed and Mobile Computing in the Department of Electrical Engineering and Computing Systems. He has been a faculty member at the ECE Dept., Carnegie Mellon University (on sabbatical leave), N.C. State University,

Raleigh and the Wayne State University. His current research interests include applications of sensor networks in monitoring Parkinson's disease patients and neurosis, applications of sensor networks in monitoring fitness of athletes' personnel wellness, etc.,. His recent contribution in the form of a co-authored introductory text book on *Introduction to Wireless and Mobile Computing* has been widely accepted throughout the world and fourth edition is in press. His co-authored book on *Ad hoc and Sensor Networks, 2nd edition*, has been published in spring of 2011. His co-authored books entitled *Wireless Sensor Networks: Deployment Alternatives and Analytical Modeling*, and *Innovative Approaches to Spectrum Selection, Sensing, On-Demand Medium Access in Heterogeneous Multihop Networks*, and *Sharing in Cognitive Radio Networks* have being published by Lambert Academic. He is a founding Editorial Board Member, *International Journal on Distributed Sensor Networks*, *International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC)*, *International Journal of Ad Hoc & Sensor Wireless Networks* and the *Journal of Information Assurance and Security (JIAS)*. He has served as an editor of the *IEEE Computer magazine*, and the *IEEE Transactions on Computers*, the *Journal of Parallel and Distributed Systems* and the *International Journal of High Speed Computing*. He was awarded a *Third Millennium Medal*, by the IEEE for his outstanding contributions. He has delivered keynote speech at 34 different international conferences. He has graduated **70 PhDs and 58 MS students**. He has been named as an **ISI Highly Cited Researcher**, is a Fellow of the **IEEE**, the **ACM**, the **AAAS** and the **World Innovation Foundation**, and a recent recipient of **2008 IEEE CS Harry Goode Award**. Recently, in June 2011, he was selected as the **best Mentor for Doctoral Students** at the University of Cincinnati. Recently, he has been inducted as a **charter fellow of the National Academy of Inventors**. He has also been elected a **Fellow of the IACSIT**.

Course Coordinator:



Dr. A. Kavitha is currently working as an Assistant Professor in the Department of Computer Science and Engineering at JNTUH College of Engineering, Hyderabad. She has more than 13 years of teaching experience. She obtained her Ph.D in Computer Science from University of Hyderabad. Her research interests include Wireless Adhoc and Sensor Networks, Mobile Computing and Embedded Systems.

About the Institute:

JNTUH College of Engineering Hyderabad, Kukatpally, Hyderabad since its inception in the year 1965 earned great reputation and fame not only in India but also all over the world. In 2008, when JNTU is divided into four universities by the Ordinance of the Govt. of A.P., the college is retained as a constituent college of JNT University Hyderabad and was renamed as JNTUH College of Engineering Hyderabad.

Contact Information:

Course Coordinator:

Dr.A.Kavitha., Assistant Professor,
Department of Computer Science and Engineering,
JNTUH College of Engineering Hyderabad
Hyderabad – 85.

Mail id: athotakavitha@jntuh.ac.in

Mobile: 91-9885232926

Local Coordinator, GIAN:

Dr. G .Krishna Mohana Rao
Professor of Mechanical Engineering &
JNTUH College of Engineering
Mail id: kmgurram@jntuh.ac.in