Title: Security Issues in Wireless Sensor Networks

The summary of the content:

Sensor nodes are small in size, self-organized, limited computational power, able to sense events, process data, and communicate with each other via radio links to transfer information. Wireless sensor networks (WSN) consist of a large number of sensor nodes in the operational field. The WSNs are usually deployed in remote places and left unattended. The operational conditions are most often harsh or even hostile. The WSNs transfer sensitive information in remote and dangerous places. The WSNs monitor the environmental conditions, such as temperature, pressure, motion, sound, vibration, and pollution. The nature of deployment and handling type of information, they should be equipped with appropriate security mechanisms. Due to their natural resource constraints traditional security techniques became major obstacles for implementation. Therefore, effective security mechanisms are required to operate sensor networks in hostile and unattended environments.

Wireless sensor networks (WSN) produce low-cost solutions to many real-world challenges. Further, they are motivated by military applications such as battle field surveillance. Today they were used in many industrial and consumer applications. These include process monitoring and control, health care applications in hospitals, environment and habitat monitoring, home automation, and traffic control.

In this tutorial, we discuss the topology of wireless sensor networks, applications, threats, and possible security measurements. Part 1 discusses the WSN topology, security threats and applications. In Part 2, we present the current security models, possible security models in WSNs, and the pit falls of security models. In the third part, we discuss the research directions in WSNs.

The biography of the presenter(s)

Yenumula B. Reddy, Professor of Computer Science, Grambling State University. His research contributions span a number of areas including wireless communications, intrusion detection, data mining, neural networks, intelligent systems, and genetic algorithms. He has published more than 90 papers in Journal/Conference proceedings (IEEE/IARIA/IFIP/IASTED) and more than 100 student project presentations in conferences. He is associate editor of proceedings of ITNG 2009, ITNG 2010, ITNG 2011, and associate editor of the book ‘Soft Computing Applications in Industry’. He is editorial board member of Journal BITM Transactions on EECC, Science Academy Transactions on Computer and Communication Networks (SATCCN), and International Journal of Engineering and Industries (IJEI). He is program committee member of ITNG, IASTED-ASM, IASTED-MSO, SENSORCOMM, Review committee member of journals IEEE-TVC, IEEE-TVT, and Journal of Communications. Dr. Reddy has been selected by Louisiana Board for International faculty exchange Program 2010 to conduct ‘High Performance Computing’ course at pole University. He is chair of ‘International Symposium on Networking and Wireless communications’ in connection with ITNG 2008, 2009, 2010, 2011 and award winner of best track in ITNG 2008 and ITNG 2009. He has successful funding record from the federal and state grant agencies.