WIRELESS SENSOR NETWORKS : ARCHITECTURE, PROTOCOLS AND SIMULATION

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PREFACE

The field of wireless communication and networks is evolving day by day, a very interesting and challenging area- Wireless Sensor Networks (WSNs) is rapidly emerging. WSNs have attracted a wide range of potential applications in varied areas like military, civilian, space, agriculture, production and industry, Healthcare and many more. A wireless sensor consists of large number of low-cost, low-power and multifunctional sensor nodes that may be randomly and densely deployed. Sensor nodes are small electronic components capable of sensing varied types of information from environment including temperature; light; humidity; gases; radiation; specific types of computer data and more. Once deployed, the sensor nodes must be able to autonomously organize themselves into a wireless communication network. The most important issue surrounding sensor networks is Energy. As sensors are deployed with limited battery source, it becomes difficult and even impossible to change or recharge batteries for sensor nodes. As compared to traditional wireless networks, WSNs are characterized with various parameters like node deployment, higher reliability of sensor nodes, power, computation and memory constraints.

Various characteristics and constraints presents new challenges for efficient design and development of WSNs. So, because of this WSN's is gaining popularity in research work among students in academic and industry for solving various design issues, energy problems, security threats and other problems of WSNs.

The purpose of this book is to provide a comprehensive and systematic introduction to WSNs in terms of

architecture, security, energy efficiency, routing protocols and simulation of WSNs in NS-3 Simulator.

The book is intended for a wide range of audience which includes graduate and post graduate students, academic researchers, industry R&D cells and engineers as a base and excellent source of information regarding WSN's and Actor Networks to learn the state-of-the-art technologies in networking aspect and simulation aspect of WSNs.

Structure of the Book: The book has total of 8 chapters covering the fundamental aspects of WSNs: Introduction, Architecture, Routing Protocols, Energy Efficiency based Routing Protocols for WSN, Security and Defence, Applications, Simulation Tools and Simulating WSN in NS-3 Simulator.

✍ *Anand Nayyar*

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✍ *Anand Nayyar*

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