



# Wireless Sensor and Actuator Networks: Technologies, Analysis and Design

*Roberto Verdone, Davide Dardari, Gianluca Mazzini, Andrea Conti*

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When choosing the technology options to develop a wireless sensor network (WSN), it is vital that their performance levels can be assessed for the type of application intended. This book describes the different technology options - MAC protocols, routing protocols, localisation and data fusion techniques - and provides the means to numerically measure their performance, whether by simulation, mathematical models or experimental test beds. Case studies, based on the authors' direct experience of implementing wireless sensor networks, describe the design methodology and the type of measurements used, together with samples of the performance measurements attained.

The book will enable you to answer vital questions such as:

- \* How long will my network remain alive given the amount of sensing required of it?
- \* For how long should I set the sleeping state of my motes?
- \* How many sensors should I distribute to meet the expected requirements of the application?
- \* What type of throughput should I expect as a function of the number of nodes deployed and the radio interface chosen (whether it be Bluetooth or Zigbee)?
- \* How is the Packet Error Rate of my Zigbee motes affected by the selection of adjacent frequency sub bands in the ISM 2.4GHz band?
- \* How is the localisation precision dependant on the number of nodes deployed in a corridor?

Communications and signal processing engineers, researchers and graduate students working in wireless sensor networks will find this book an invaluable practical guide to this important technology.

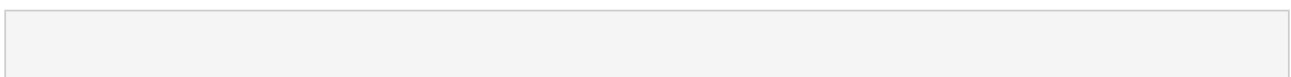
*"This book gives a proper balance between theory and application; it is a book for those R&D engineers that want to appreciate both why, how and in which domains Wireless Sensor Networks can be best applied."* - Fabio Bellifemine, Telecom Italia

*"This book is a thorough and accessible exposition on wireless sensor networks with a good balance between theory and practice; it is valuable for both students and practicing engineers, and is an essential addition for engineering libraries."* - Professor Moe Win, Associate Professor at the Laboratory for Information and Decision Systems (LIDS), Massachusetts Institute of Technology

\*Only book to examine wireless sensor network technologies and assess their performance capabilities against possible applications

\*Enables the engineer to choose the technology that will give the best performance for the intended application

\*Case studies, based on the authors' direct experience of implementing wireless sensor networks, describe the design methodology and the type of measurements used, together with samples of the performance measurements attained



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