In this book, the authors describe the fundamental concepts and practical aspects of wireless sensor networks. The book provides a comprehensive view to this rapidly evolving field, including its many novel applications, ranging from protecting civil infrastructure to pervasive health monitoring. Using detailed examples and illustrations, this book provides an inside track on the current state of the technology. The book is divided into three parts. In Part I, several node architectures, applications and operating systems are discussed. In Part II, the basic architectural frameworks, including the key building blocks required for constructing large-scale, energy-efficient sensor networks are presented. In Part III, the challenges and approaches pertaining to local and global management strategies are presented – this includes topics on power management, sensor node localization, time synchronization, and security. At the end of each chapter, the authors provide practical exercises to help students strengthen their grip on the subject. There are more than 200 exercises altogether.

Key Features:

• Offers a comprehensive introduction to the theoretical and practical concepts pertaining to wireless sensor networks

• Explains the constraints and challenges of wireless sensor network design; and discusses the most promising solutions

• Provides an in-depth treatment of the most critical technologies for sensor network communications, power management, security, and programming
• Reviews the latest research results in sensor network design, and demonstrates how the individual components fit together to build complex sensing systems for a variety of application scenarios
• Includes an accompanying website containing solutions to exercises (http://www.wiley.com/go/dargie_fundamentals)

This book serves as an introductory text to the field of wireless sensor networks at both graduate and advanced undergraduate level, but it will also appeal to researchers and practitioners wishing to learn about sensor network technologies and their application areas, including environmental monitoring, protection of civil infrastructure, health care, precision agriculture, traffic control, and homeland security.

ABOUT THE AUTHOR

Professor Dargie completed his BSc in Electrical and Electronics Technology at Nazareth Technical College, Ethiopia, and obtained an MSc in Electrical Engineering at Kaiserslautern University of Technology, Germany. He completed his PhD in Computer Engineering at Dresden University of Technology, Germany, where he works today as a Researcher for the Faculty of Computer Science.

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