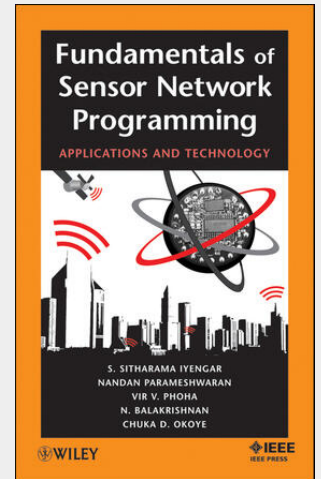Iyengar / Parameshwaran / Phoha

Fundamentals of Sensor Network Programming

Applications and Technology

This book provides the basics needed to develop sensor network software and supplements it with many case studies covering network applications. It also examines how to develop onboard applications on individual sensors, how to interconnect these sensors, and how to form networks of sensors, although the major aim of this book is to provide foundational principles of developing sensor networking software and critically examine sensor network applications.

An introduction to software development in sensor networks Sensor processing is central to aerospace and defense, automation, medical imaging, and robotics. Fundamentals of Sensor Network Programming provides the basics needed to develop sensor network software and supplements. It also examines how to develop onboard applications on individual sensors, how to interconnect these sensors, how to form networks of sensors, and how these networks interact with the physical world. Included is actual code tested in a laboratory environment, as well as structured examples that allow demonstration of material with only a small network of four or more sensor nodes and a laptop. Fundamentals of Sensor Network Programming concentrates on the class of sensors having severely constrained computation, communication, and energy resources. These devices are usually penny- to matchbox-sized and are deployed in an ad-hoc fashion. This book presents techniques for programming so the sensors can work effectively as a group. Although the focus is on programming the individual sensor, the goal is to make the sensor work in a collaborative environment. With principles that may serve as building blocks for developing large-scale, long-lived systems, the book: * Develops programming methodologies unique to sensor networks * Examines how sensors can be interconnected * Shows how networks of sensors are formed * Includes actual code tested in a laboratory environment * Presents case studies covering network applications Providing a balance between theory and applications, this resource will prove beneficial for professionals working in industry, graduate students, computer science professionals, and academic researchers.

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