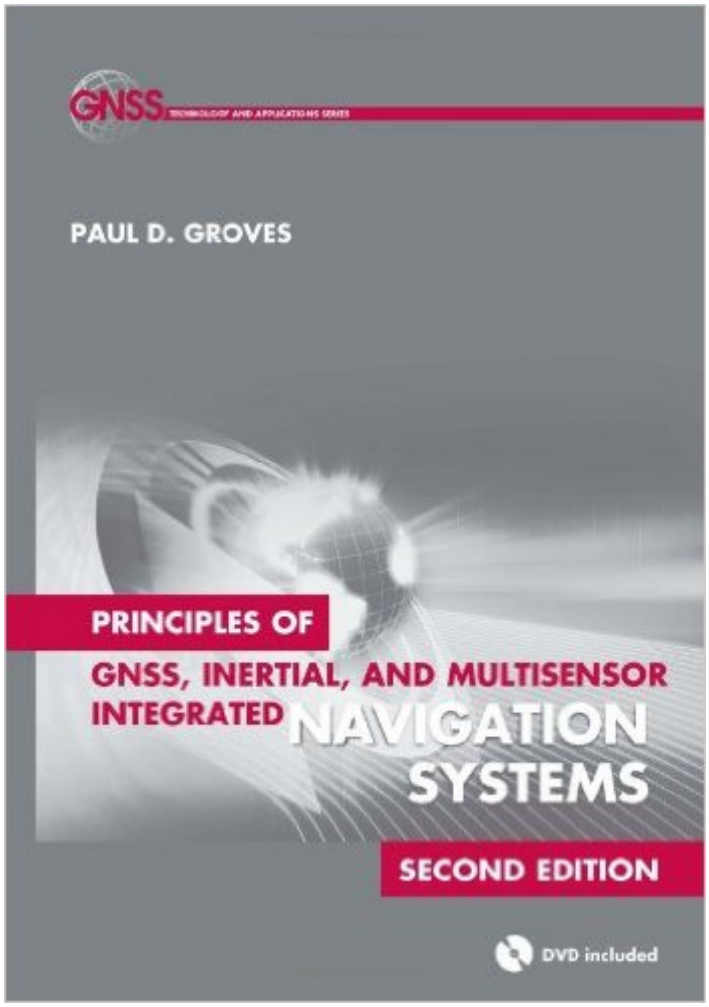
Principles Of GNSS, Inertial, And Multisensor Integrated Navigation Systems, Second Edition (Artech House Remote Sensing Library)



Synopsis

This newly revised and greatly expanded edition of the popular Artech House book Principles of GNSS, Inertial, and Multisensor Integrated Navigation Systems offers you a current and comprehensive understanding of satellite navigation, inertial navigation, terrestrial radio navigation, dead reckoning, and environmental feature matching. It provides both an introduction to navigation systems and an in-depth treatment of INS/GNSS and multisensor integration. The second edition offers a wealth of added and updated material, including a brand new chapter on the principles of radio positioning and a chapter devoted to important applications in the field. Other updates include expanded treatments of map matching, image-based navigation, attitude determination, acoustic positioning, pedestrian navigation, advanced GNSS techniques, and several terrestrial and short-range radio positioning technologies.The book shows you how satellite, inertial, and other navigation technologies work, and focuses on processing chains and error sources. In addition, you get a clear introduction to coordinate frames, multi-frame kinematics, Earth models, gravity, Kalman filtering, and nonlinear filtering. Providing solutions to common integration problems, the book describes and compares different integration architectures, and explains how to model different error sources. You get a broad and penetrating overview of current technology and are brought up to speed with the latest developments in the field, including context-dependent and cooperative positioning.DVD Included! Features eleven appendices, interactive worked examples, basic GNSS and INS MatlabÂ® simulation software, and problems and exercises to help you master the material.Contents: Preface. Introduction. Co-ordinate Frames, Kinematics, And The Earth. Kalman Filter-Based Estimation. Inertial Sensors. Inertial Navigation. Dead Reckoning, Attitude, and Height Measurement. Principles of Radio Positioning. GNSS: Fundamentals, Signals, and Satellites. GNSS: User Equipment Processing and Errors. GNSS: Advanced Techniques. Long- and Medium-Range Radio Navigation. Short-Range Positioning. Environmental Feature Matching. INS/GNSS Integration. INS Alignment, Zero Updates, and Motion Constraints. Multisensor Integrated Navigation. Fault Detection, Integrity Monitoring, and Testing. Applications and Future Trends. List of Symbols. List of Acronyms and Abbreviations. About the Author. Index.

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Customer Reviews

Are you a professional engineer or scientist in industry, academia, and government? If you are, then this book is for you. Author Paul D. Groves (Author), has done an outstanding job of writing a second edition of a book that covers navigation of air, land, sea, underwater, and space vehicles, both piloted and autonomous, together with pedestrian navigation.Author Groves, begins by introducing the basic concepts of navigation technology, compares the main technologies, and provides a qualitative overview of the material covered in the body of the book. Next, the author provides the mathematical and physical foundations of navigation. Then, he shows you how the Kalman filter may be adapted for practical use in navigation applications. In addition, the author describes the basic principles of accelerometer, gyro, and IMU technology, compares the different types of sensor, and reviews the error sources. He continues by focusing on the navigation processor. The author then describes commonly used dead-reckoning techniques other than inertial navigation, together with a number of techniques for measuring attitude, height, and depth. Next, he explains the physical principles of radio positioning and discusses the characteristics that are common across the different technologies, both spacebased and terrestrial. Then, he provides an introduction to satellite navigation and describes the satellite signals and orbits. In addition, he describes how GNSS user equipment processes the signals from the satellites to obtain ranging measurements and then a navigation solution. The author continues by reviewing a number of techniques that enhance the accuracy, robustness, and reliability of GNSS.

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