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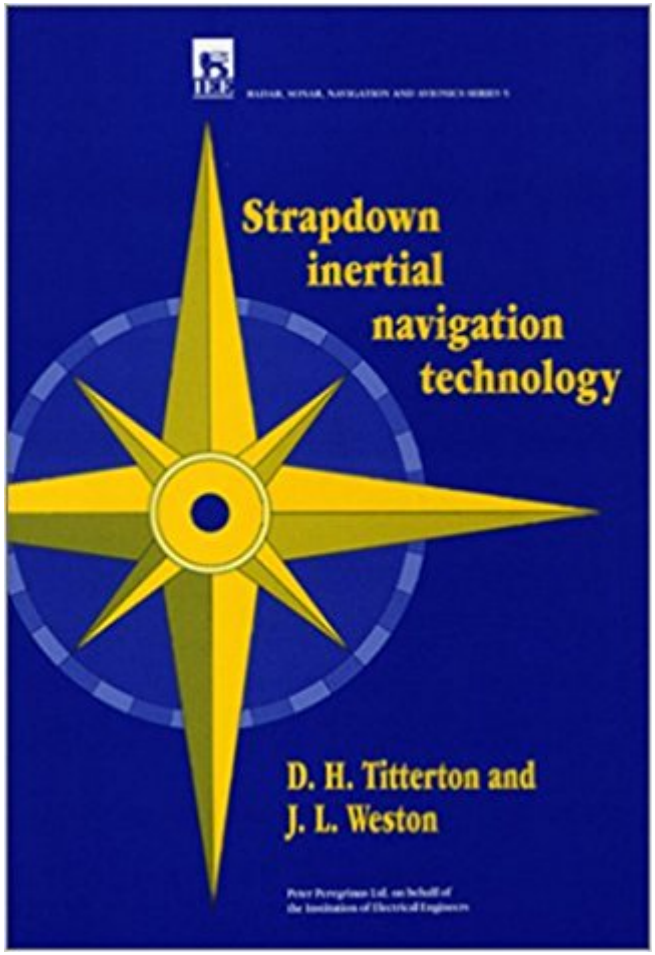
Strapdown Inertial Navigation Technology (Iee Radar, Sonar, Navigation And Avionics, No 5)



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Synopsis

Inertial navigation is widely used for the guidance of aircraft, ships, missiles and vehicles. This introduction to the system covers basic principles, system mechanics, instrumentation, computation and design analysis. The text features a particularly contemporary treatment of inertial sensors and computational techniques for error analysis. It also describes integrated systems incorporating additional navigational aids and examples of current applications in both civilian and military situations.

Book Information

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Customer Reviews

David Titterton is a principal scientist at DRA, researching novel technology. He spent more than a decade researching navigation and guidance technology for a range of aerospace applications, which led to a number of publications. During this time he was also involved in the development and evaluation of miniature inertial sensors, and he also studied the ''system issues'' associated with the integration of strapdown technology to new applications. The University of Sheffield awarded him a BSc in Physics in 1969 and a PhD in 1973 for his research into the atomic structure of crystals.
John Weston is a navigation consultant with Sperry-Sun (UK) Ltd, concerned with the application of strapdown technology to well-bore surveying. Prior to this he worked in missile guidance and control, originally with British Aerospace plc, and, more recently, with Beacon Consultants Ltd, a technical consultancy, which he cofounded in 1984. His research interests include strapdown

alignment and aided inertial systems, which have led to a number of publications. He received his BSc in Electrical Engineering from the University of Wales in 1968 and his MSc in Control Systems from the University of Birmingham in 1970. He is a member of the IEE.

An excellent text that has helped me work through some challenges with a legacy inertial navigation system in one of our underwater systems and provided a better overall understanding of the topic area, including advances in inertial sensor technology.

This book has the most comprehensive breakdown and analysis of the principles and modeling of accelerometer and gyro technologies I've seen in a book yet, though there are already some very good books on stable platform products. There's also a wealth of information on various coordinate systems used in the vicinity of Earth. While an entire chapter is devoted to MEMS, it would seem that the mechanization material (as well as alignment) is geared towards higher-end devices, in that many MEMS units I've encountered cannot readily identify any component of Earth's rotation, making much of the math superfluous for my application. There is a chapter near the end that deals briefly with aiding, but don't count on that being enough. A number of real-world periodic motions, both short-term (coning, sculling) and long-term (Schuler, Foucault), are identified, and the references to literature at the end of each section are invaluable in digging deeper. Kalman filtering is relegated to an appendix, but that is fine, as this book is significantly more oriented to applications; pick up a copy of Gelb if you need an intro to estimation.

Despite covering a wide range of complex subjects, the explanations in this book are clear. This book played a key role in my understanding of INS systems, and I highly recommend it to others.

A good introduction from the ground up. Concepts were easily conveyed to the reader. I'm much more comfortable with strapdown systems after reading this book.

Strapdown Inertial Nav. is an excellent book for those who would like to understand the technology or learn how to process inertial sensor data.

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