

Advanced Techniques in Tracking and Sensor Management

Theory and Applications

Explores advanced tracking, sensor management, and distributed fusion for modern engineering applications. Advances in statistical signal processing, sensor networks, and control theory have created a need for a unified resource on nonlinear filtering, multitarget tracking, sensor management, and distributed fusion. Advanced Techniques in Tracking and Sensor Management: Theory and Applications offers an overview of the algorithms, frameworks, and applications shaping tracking and sensor research. Drawing on four decades of research, the book is organized into four parts covering nonlinear filtering, multi-sensor and multitarget tracking, sensor management, and distributed fusion. Topics include particle filtering for constrained systems, random finite set-based multitarget tracking, scheduling and resource allocation, and consensus-based fusion. The book combines theory with applications in radar, surveillance, space situational awareness, and autonomous navigation. Chapters by international experts make complex concepts accessible to engineers, scientists, and graduate students. Both a graduate-level textbook and a practitioner reference for defense, aerospace, and autonomous systems, this book:

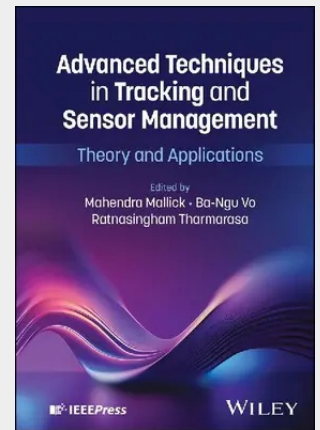
- Features algorithms for space object tracking, debris detection, and SLAM using finite set statistics
- Covers Bayesian filtering and multitarget estimation in cluttered, uncertain environments
- Introduces approaches to satellite scheduling and power allocation for MIMO radar systems
- Explores distributed state estimation and multi-object density fusion across sensor networks

This book is essential reading for graduate courses in statistical signal processing, target tracking, and sensor management in electrical and computer engineering. It is also a valuable resource for engineers and researchers in aerospace, defense, autonomous systems, and surveillance.

Explores advanced tracking, sensor management, and distributed fusion for modern engineering applications. Advances in statistical signal processing, sensor networks, and control theory have created a pressing need for a unified resource that synthesizes the latest developments in nonlinear filtering, multitarget tracking, sensor management, and distributed fusion. Advanced Techniques in Tracking and Sensor Management: Theory and Applications provides a carefully structured overview of the state-of-the-art algorithms, mathematical frameworks, and real-world applications that define the current landscape of tracking and sensor research. Unifying four decades of research, the book is divided into four parts, each focusing on a central domain: nonlinear filtering, multi-sensor and multitarget tracking, sensor management, and distributed fusion. Topics include particle filtering methods for constrained systems, random finite set-based multitarget tracking, advanced scheduling and resource allocation strategies for sensor management, and consensus-based techniques for distributed fusion. These areas are covered with both theoretical rigor and practical clarity, highlighting their application to radar systems, intelligence and surveillance operations, and space situational awareness. Each in-depth chapter, authored by leading international experts, balances mathematical exposition with illustrative applications to make complex concepts accessible to engineers, scientists, and graduate students. Both a textbook for advanced study and a reference for practitioners working at the forefront of defense, aerospace, and autonomous systems, Advanced Techniques in Tracking and Sensor Management:

- Features cutting-edge algorithms for space object tracking, space debris detection, and SLAM with finite set statistics
- Provides rigorous treatments of Bayesian filtering and multitarget estimation methods under cluttered, and uncertain environments
- Introduces new approaches to multi-agile satellite scheduling and robust power allocation for MIMO radar systems
- Explores distributed state estimation and multi-object density fusion across sensor networks

Advanced Techniques in Tracking and Sensor Management: Theory and Applications is essential reading for graduate-level courses in statistical signal processing, target tracking, and sensor management within electrical and computer engineering programs. It is also a key reference for engineers and researchers working in aerospace, defense, autonomous systems, and surveillance industries.

**154,50 €**

154,50 € (zzgl. MwSt.)

vorbestellbar, Erscheinungstermin ca.
Oktober 2026

Artikelnummer: 9781394332014**Medium:** Buch**ISBN:** 978-1-394-33201-4**Verlag:** Not Stated**Erscheinungstermin:** 20.10.2026**Sprache(n):** Englisch**Auflage:** 1. Auflage 2026**Produktform:** Kartoniert**Seiten:** 832