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Nota di contenuto	KNOWLEDGE-BASED RADAR DETECTION, TRACKING, AND CLASSIFICATION; CONTENTS; Contributors; 1 Introduction; 1.1 Organization of the Book; Acknowledgments; References; 2 Cognitive Radar; 2.1 Introduction; 2.2 Cognitive Radar Signal-Processing Cycle; 2.3 Radar-Scene Analysis; 2.3.1 Statistical Modeling of Statistical Representation of Clutter- and Target-Related Information; 2.4 Bayesian Target Tracking; 2.4.1 One-Step Tracking Prediction; 2.4.2 Tracking Filter; 2.4.3 Tracking Smoother; 2.4.4 Experimental Results: Case Study of Small Target in Sea Clutter 2.4.5 Practical Implications of the Bayesian Target Tracker2.5 Adaptive Radar Illumination; 2.5.1 Simulation Experiments in Support of Adjustable Frequency Modulation; 2.6 Echo-Location in Bats; 2.7 Discussion; 2.7.1 Learning; 2.7.2 Applications; 2.7.2.1 Multifunction

Radars; 2.7.2.2 Noncoherent Radar Network; Acknowledgments; References; 3 Knowledge-Based Radar Signal and Data Processing: A Tutorial Overview; 3.1 Radar Evolution; 3.2 Taxonomy of Radar; 3.3 Signal Processing; 3.4 Data Processing; 3.5 Introduction to Artificial Intelligence; 3.5.1 Why Robotics and Knowledge-Based Systems?
3.5.2 Knowledge Base Systems (KBS)3.5.3 Semantic Web Technologies; 3.6 A Global View and KB Algorithms; 3.6.1 An Airborne Autonomous Intelligent Radar System (AIRS); 3.6.2 Filtering, Detection, and Tracking Algorithms and KB Processing; 3.7 Future work; 3.7.1 Target Matched Illumination; 3.7.2 Spectral Interpolation; 3.7.3 Bistatic Radar and Passive Coherent Location; 3.7.4 Synthetic Aperture Radar; 3.7.5 Resource Allocation in a Multifunction Phased Array Radar; 3.7.6 Waveform Diversity and Sensor Geometry; Acknowledgments; References
4 An Overview of Knowledge-Aided Adaptive Radar at DARPA and Beyond4.1 Introduction; 4.1.1 Background on STAP; 4.1.2 Examples of Real-World Clutter; 4.2 Knowledge-Aided STAP (KA-STAP); 4.2.1 Knowledge-Aided STAP: Back to "Bayes-ics"; 4.2.1.1 Case I: Intelligent Training and Filter Selection (ITFS); 4.2.1.2 Case II: Bayesian Filtering and Data Pre-Whitening; 4.3 Real-Time KA-STAP: The DARPA KASSPER Program; 4.3.1 Obstacles to Real-Time KA-STAP; 4.3.2 Solution: Look-Ahead Scheduling; 4.4 Applying KA Processing to the Adaptive MIMO Radar Problem
4.5 The Future: Next-Generation Intelligent Adaptive SensorsReferences; 5 Space-Time Adaptive Processing for Airborne Radar: A Knowledge-Based Perspective; 5.1 Introduction; 5.2 Problem Statement; 5.3 Low Computation Load Algorithms; 5.3.1 Joint Domain Localized Processing; 5.3.2 Parametric Adaptive Matched Filter; 5.3.3 Multistage Wiener Filter; 5.4 Issues of Data Support; 5.4.1 Nonhomogeneity Detection; 5.4.2 Direct Data Domain Methods; 5.4.2.1 Hybrid Approach; 5.5 Knowledge-Aided Approaches; 5.5.1 A Preliminary Knowledge-Based Processor; 5.5.2 Numerical Example; 5.5.3 A Long-Term View
5.6 Conclusions

Sommario/riassunto

Discover the technology for the next generation of radar systems Here is the first book that brings together the key concepts essential for the application of Knowledge Based Systems (KBS) to radar detection, tracking, classification, and scheduling. The book highlights the latest advances in both KBS and radar signal and data processing, presenting a range of perspectives and innovative results that have set the stage for the next generation of adaptive radar systems. The book begins with a chapter introducing the concept of Knowledge Based (KB) radar. The remaining nine chapters focus