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Descrizione fisica	1 online resource (xiv, 174 pages) : illustrations (some color)
Collana	Gale eBooks
Disciplina	004.0151 519.2
Soggetti	Random sets Stochastic processes Estimation theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- References -- Background -- A brief review of particle filters -- Online sensor control -- Non-standard measurements -- Imprecise measurements -- Imprecise measurement function -- Uncertain implication rules -- Particle filter implementation -- Applications -- Multiple objects and imperfect detection -- Random finite sets -- Multi-object stochastic filtering -- OSPA metric -- Specialized multi-object filters -- Bernoulli filter -- PHD and CPHD filter -- References -- Applications involving non-standard measurements -- Estimation using imprecise measurement models -- Localization using the received signal strength -- Prediction of an epidemic using syndromic data -- Summary -- Fusion of spatially referring natural language statements -- Language, space and modelling -- An illustrative example -- Classification using imprecise likelihoods -- Modelling -- Classification results -- References -- object particle filters -- Bernoulli particle filters -- Standard Bernoulli particle filters -- Bernoulli box-particle filter -- PHD/CPDH particle filters with adaptive birth intensity -- Extension of the PHD filter -- Extension of the CPHD filter -- Implementation -- A numerical study -- State estimation from PHD/CPHD particle filters -- Particle filter approximation of the exact multi-object filter -- References -- Sensor control for random set based particle filters -- Bernoulli particle filter

with sensor control -- The reward function -- Bearings only tracking in clutter with observer control -- Target Tracking via Multi-Static Doppler Shifts -- Sensor control for PHD/CPHD particle filters -- The reward function -- A numerical study -- Sensor control for the multi-target state particle filter -- Particle approximation of the reward function -- A numerical study -- References -- Multi-target tracking -- OSPA-T: A performance metric for multi-target tracking -- The problem and its conceptual solution -- The base distance and labeling of estimated tracks -- Numerical examples -- Trackers based on random set filters -- Multi-target trackers based on the Bernoulli PF -- Multi-target trackers based on the PHD particle filter -- Error performance comparison using the OSPA-T error -- Application: Pedestrian tracking -- Video dataset and detections -- Description of Algorithms -- Numerical results -- References -- Advanced topics -- Filter for extended target tracking -- Mathematical models -- Equations of the Bernoulli filter for an extended target -- Numerical Implementation -- Simulation results -- Application to a surveillance video -- Calibration of tracking systems -- Background and problem formulation -- The proposed calibration algorithm -- Importance sampling with progressive correction -- Application to sensor bias estimation -- References -- Index.

Sommario/riassunto

“Particle Filters for Random Set Models” presents coverage of state estimation of stochastic dynamic systems from noisy measurements, specifically sequential Bayesian estimation and nonlinear or stochastic filtering. The class of solutions presented in this book is based on the Monte Carlo statistical method. The resulting algorithms, known as particle filters, in the last decade have become one of the essential tools for stochastic filtering, with applications ranging from navigation and autonomous vehicles to bio-informatics and finance. While particle filters have been around for more than a decade, the recent theoretical developments of sequential Bayesian estimation in the framework of random set theory have provided new opportunities which are not widely known and are covered in this book. These recent developments have dramatically widened the scope of applications, from single to multiple appearing/disappearing objects, from precise to imprecise measurements and measurement models. This book is ideal for graduate students, researchers, scientists and engineers interested in Bayesian estimation.