1. Record Nr. UNINA9910847079503321

Autore	Fadali M. Sami
Titolo	Introduction to Random Signals, Estimation Theory, and Kalman Filtering / / by M. Sami Fadali
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	981-9980-63-1
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (489 pages)
Disciplina	519.544
Soggetti	Automatic control Robotics Automation Aerospace engineering Astronautics Telecommunication Control, Robotics, Automation Aerospace Technology and Astronautics Communications Engineering, Networks
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Review of Probability Theory -- Random Variables -- Random Signals (autocorrelation, power spectral density) -- Response of Linear Systems to Random Inputs (continuous, discrete) -- Estimation and Estimator Properties (small sample and large sample properties of estimators, CRLB) -- Least Square Estimation Likelihood (likelihood function, detection) -- Maximum Likelihood Estimation -- Minimum Mean-Square Error Estimation (Kalman Filter, information filter, filter stability) -- Generalizing the Basic Kalman Filter (colored noise, correlated noise, reduced-order estimator, Schmidt Kalman filter sequential computation) -- Prediction and Smoothing -- Nonlinear Filtering (Extended Kalman filter, unscented Kalman filter, ensemble Kalman filter, particle filter) -- The Expectation Maximization Algorithm -- Markov Models.
Sommario/riassunto	This book provides first-year graduate engineering students and

practicing engineers with a solid introduction to random signals and estimation. It includes a statistical background that is often omitted in other textbooks but is essential for a clear understanding of estimators and their properties. The book emphasizes applicability rather than mathematical theory. It includes many examples and exercises to demonstrate and learn the theory that makes extensive use of MATLAB and its toolboxes. Although there are several excellent books on random signals and Kalman filtering, this book fulfills the need for a book that is suitable for a single-semester course that covers both random signals and Kalman filters and is used for a two-semester course for students that need remedial background. For students interested in more advanced studies in the area, the book provides a bridge between typical undergraduate engineering education and more advanced graduate-level courses.