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Titolo	Prognostics and Health Management of Engineering Systems : An Introduction / / by Nam-Ho Kim, Dawn An, Joo-Ho Choi
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Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XIV, 347 p. 166 illus., 155 illus. in color.)
Disciplina	621.042
Soggetti	Renewable energy resources Aerospace engineering Astronautics Signal processing Image processing Speech processing systems Building materials Civil engineering Renewable and Green Energy Aerospace Technology and Astronautics Signal, Image and Speech Processing Structural Materials Civil Engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction -- Tutorials for Prognostics -- Bayesian Statistics for Prognostics -- Physics-Based Prognostics -- Data-Driven Prognostics -- Study on Attributes of Prognostic Methods -- Applications of Prognostics.
Sommario/riassunto	This book introduces the methods for predicting the future behavior of a system’s health and the remaining useful life to determine an appropriate maintenance schedule. The authors introduce the history, industrial applications, algorithms, and benefits and challenges of PHM

(Prognostics and Health Management) to help readers understand this highly interdisciplinary engineering approach that incorporates sensing technologies, physics of failure, machine learning, modern statistics, and reliability engineering. It is ideal for beginners because it introduces various prognostics algorithms and explains their attributes, pros and cons in terms of model definition, model parameter estimation, and ability to handle noise and bias in data, allowing readers to select the appropriate methods for their fields of application. Among the many topics discussed in-depth are: • Prognostics tutorials using least-squares • Bayesian inference and parameter estimation • Physics-based prognostics algorithms including nonlinear least squares, Bayesian method, and particle filter • Data-driven prognostics algorithms including Gaussian process regression and neural network • Comparison of different prognostics algorithms The authors also present several applications of prognostics in practical engineering systems, including wear in a revolute joint, fatigue crack growth in a panel, prognostics using accelerated life test data, fatigue damage in bearings, and more. Prognostics tutorials with a Matlab code using simple examples are provided, along with a companion website that presents Matlab programs for different algorithms as well as measurement data. Each chapter contains a comprehensive set of exercise problems, some of which require Matlab programs, making this an ideal book for graduate students in mechanical, civil, aerospace, electrical, and industrial engineering and engineering mechanics, as well as researchers and maintenance engineers in the above fields.