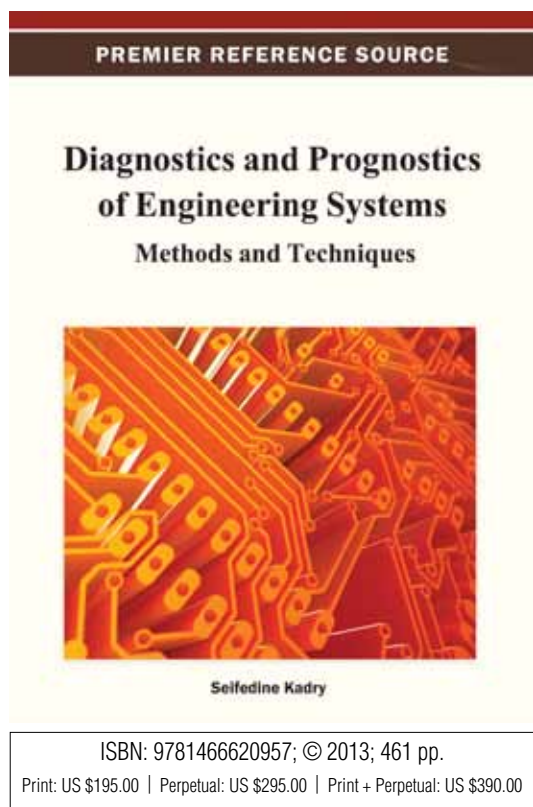


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Released: September 2012

Diagnostics and Prognostics of Engineering Systems: Methods and Techniques



Seifedine Kadry (American University of the Middle East, Kuwait)

Industrial Prognostics predicts an industrial system's lifespan using probability measurements to determine the way a machine operates. Prognostics are essential in determining being able to predict and stop failures before they occur. Therefore the development of dependable prognostic procedures for engineering systems is important to increase the system's performance and reliability.

Diagnostics and Prognostics of Engineering Systems: Methods and Techniques provides widespread coverage and discussions on the methods and techniques of diagnosis and prognosis systems. Including practical examples to display the method's effectiveness in real-world applications as well as the latest trends and research, this reference source aims to introduce fundamental theory and practice for system diagnosis and prognosis.

Topics Covered:

- Empirical Methods for Process and Equipment Prognostics
- Examples and Case Studies of Prognostics and Health Management
- In-Situ Monitoring Techniques
- Life Cycle Cost and Return on Investment for Prognostics and Health Management
- Making Predictions
- Monitoring Environmental and Usage Conditions
- Physics of Failure Based Prognostics
- Prognostics for Electronic Products
- Reliability and Prognostics
- Self Cognitive Capability for Anomaly Detection, Fault Analysis and Prognosis
- Sensors for Prognostics
- Time Series Analysis

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Market: This premier publication is essential for all academic and research library reference collections. It is a crucial tool for academicians, researchers, and practitioners and is ideal for classroom use.

Seifedine Kadry is an associate professor of Applied Mathematics in the American University of the Middle East Kuwait. He received his masters' degree in Modelling and Intensive Computing (2001) from the Lebanese University – EPFL -INRIA. He did his doctoral research (2003-2007) in applied mathematics from Blaise Pascal University-Clermont Ferrand II, France. He worked as Head of Software Support and Analysis Unit of First National Bank where he designed and implement the data warehouse and business intelligence; he has published one book and more than 50 papers on Applied Math, computer science and stochastic systems in peer-reviewed journals.

Section 1: Fault Tolerant Control

Chapter 1
Iterative Fault Tolerant Control for General Discrete-Time Stochastic Systems Using Output Probability Density Estimation
Skaf Zakwan (University of Manchester, UK.)

Section 2: Anomaly/Fault Detection

Chapter 2
Intelligent System Monitoring:
García Claudia Maria (Universitat Politècnica de Catalunya UPC, Spain)

Section 3: Data Driven Diagnostics

Chapter 3
Principles of Classification
Lumme Veli (Tampere University of Technology, Finland)

Chapter 4
Generating Indicators for Diagnosis of Fault Levels by Integrating Information from Two or More Sensors
Zhao Xiaomin (University of Alberta, Canada)
Zuo Ming J (University of Alberta, Canada)
Moghaddass Ramin (University of Alberta, Canada)

Chapter 5
Fault Detection and Isolation for Switching Systems using a Parameter-Free Method
Hakem Assia (Lille 1 University, France)
Pekpe Komi Midzodzi (Lille 1 University, France)
Cocquempot Vincent (Lille 1 University, France)

Section 4: Data Driven Prognostics

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Bechhoefer Eric (NRG Systems, USA)

Section 5: Degradation Modeling

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Coble Jamie (Pacific Northwest National Laboratory, USA)
Hines J. Wesley (The University of Tennessee, USA)

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Moghaddass Ramin (University of Alberta, Canada)
Zuo Ming J (University of Alberta, Canada)
Zhao Xiaomin (University of Alberta, Canada)

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Stochastic Fatigue of a Mechanical System Using Random Transformation Technique
Kadry Seifedine (American University of the Middle East, Kuwait)

Chapter 10
Degradation Based Condition Classification and Prediction in Rotating Machinery Prognostics
Liu Chao (Tsinghua University, P. R. China)
Jiang Dongxiang (Tsinghua University, P. R. China)

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Zhou Junhong (Singapore Institute of Manufacturing Technology)

Section 7: Integration of Control and Prognostics

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Quevedo Joseba (Universitat Politècnica de Catalunya, Spain)
Puig Vicenç (Universitat Politècnica de Catalunya, Spain)
Nejjari Fatiha (Universitat Politècnica de Catalunya, Spain)

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Zhu Junda (The University of Illinois-Chicago, USA)

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Li Zhixiong (Reliability Engineering Institute, Wuhan University of Technology, China)
Zhang Yuelei (Reliability Engineering Institute, Wuhan University of Technology, China)
Sheng Chenxing (Reliability Engineering Institute, Wuhan University of Technology, China)
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Liu Yongming (Clarkson University, USA)

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He Jingjing (Clarkson University, USA)
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