Machine Fault Diagnosis And Maintenance Series Lathes Common Fault Diagnosis And Maintenance 2chinese Edition

Condition monitoring, fault diagnosis and prognosis of machinery have received considerable attention and they are important in industry because of the need to increase reliability. This book is suitable for those who want to study feature-based intelligent machine fault diagnosis and prognosis techniques.
SEME2014 is a convention which aims at calling for people's attention to the improvements of education environments and providing excellent researchers from the world an opportunity to present their creative and inspiring ideas. The wide range of topics for SEME2014 includes social research like social network analysis, social system dynamics and area studies, education science and technology like higher education, teaching theory, multimedia teaching and lifelong teaching, management science and engineering like management theory, decision analysis and economics management etc. SEME2014 holds the advance and improvement of Social, Education and Management Engineering as its earnest purpose. And to achieve this goal, experts and scholars of excellence in their domains are invited to present their latest and inspiring works. All the attendees will gain great benefits both on his academic ability and personal experience.
Condition modelling and control is a technique used to enable decision-making in manufacturing processes of interest to researchers and practising engineering. Condition Monitoring and Control for Intelligent Manufacturing will be bought by researchers and graduate students in manufacturing and control and engineering, as well as practising engineers in industries such as automotive and packaging manufacturing.
Find the Fault in the Machines Drawing on the author's more than two decades of experience with machinery condition monitoring and consulting for industries in India and abroad, Machinery Condition Monitoring: Principles and Practices introduces the practicing engineer to the techniques used to effectively detect and diagnose faults in machines. Providing the working principle behind the instruments, the important elements of machines as well as the technique to understand their conditions, this text presents every available method of machine fault detection occurring in machines in general, and rotating machines in particular. A Single-Source Solution for Practice Machinery Conditioning Monitoring Since vibration is one of the most widely used fault detection techniques, the book offers an assessment of vibration analysis and rotor-dynamics. It also covers the techniques of wear and debris analysis, and motor current signature analysis to detect faults in rotating mechanical systems as well as thermography, the nondestructive test NDT techniques (ultrasonics and radiography), and additional methods. The author includes relevant case studies from his own experience spanning over the past 20 years, and detailing practical fault diagnosis exercises involving various industries ranging from steel and cement plants to gas turbine driven frigates. While mathematics is kept to a minimum, he also provides worked examples and MATLAB® codes. This book contains 15 chapters and provides topical information that includes: A brief overview of the maintenance techniques Fundamentals of machinery vibration and rotor dynamics Basics of signal processing and instrumentation, which are essential for monitoring the health of machines Requirements of vibration monitoring and noise monitoring Electrical machinery faults Thermography for condition monitoring Techniques of wear debris analysis and some of the nondestructive test (NDT) techniques for condition monitoring like ultrasonics and radiography Machine tool condition monitoring Engineering failure analysis Several case studies, mostly on failure analysis, from the author's consulting experience Machinery Condition Monitoring: Principles and Practices presents the latest techniques in fault diagnosis and prognosis, provides many real-life practical examples, and empowers you to diagnose the faults in machines all on your own.
Predictive Maintenance in Dynamic Systems
Complex System Maintenance Handbook
Fault Detection, Diagnosis and Prognosis
Principles and Practices
2021 6th International Conference on Intelligent Transportation Engineering (ICITE 2021)
International Conference on Social, Education and Management Engineering

With increasing demands for efficiency and product quality plus progress in the integration of automatic control systems in high-cost mechatronic and safety-critical processes, the field of supervision (or monitoring), fault detection and fault diagnosis plays an important role. The book gives an introduction into advanced methods of fault detection and diagnosis (FDD). After definitions of important terms, it considers the reliability, availability, safety and systems integrity of technical processes. Then fault-detection methods for single signals without models such as limit and trend checking and with harmonic and stochastic models, such as Fourier analysis, correlation and wavelets are treated. This is followed by fault detection with process models using the relationships between signals such as parameter estimation, parity equations, observers and principal component analysis. The treated fault-diagnosis methods include classification methods from Bayes classification to neural networks with decision trees and inference methods from approximate reasoning with fuzzy logic to hybrid fuzzy-neuro systems. Several practical examples for fault detection and diagnosis of DC motor drives, a centrifugal pump, automotive suspension and tire demonstrate applications.
*Expert guidance on theory and practice in condition-based intelligent machine fault diagnosis and failure prognosis Intelligent Fault Diagnosis and Prognosis for Engineering Systems gives a complete presentation of basic essentials of fault diagnosis and failure prognosis, and takes a look at the cutting-edge discipline of intelligent fault diagnosis and failure prognosis technologies for condition-based maintenance. It thoroughly details the interdisciplinary methods required to understand the physics of failure mechanisms in materials, structures, and rotating equipment, and also presents strategies to detect faults or incipient failures and predict the remaining useful life of failing components. Case studies are used throughout the book to illustrate enabling technologies. Intelligent Fault Diagnosis and Prognosis for Engineering Systems offers material in a holistic and integrated approach that addresses the various interdisciplinary components of the field--from electrical, mechanical, industrial, and computer engineering to business management. This invaluably helpful book: * Includes state-of-the-art algorithms, methodologies, and contributions from leading experts, including cost-benefit analysis tools and performance assessment techniques * Covers theory and practice in a way that is rooted in industry research and experience * Presents the only systematic, holistic approach to a strongly interdisciplinary topic*
Diagnostics: Test don't guess. Learn all the skills you need to pass Level 3 and 4 Vehicle Diagnostics courses from IMI, City & Guilds, and BTEC, as well as ASE, AUR, and other higher-level qualifications. Along with 25 new real-life case studies, this fifth edition of Advanced Automotive Fault Diagnosis includes new content on diagnostic tools and equipment: VCDS, decade boxes, scanners, pass through, sensor simulators, break out boxes, multimeter updates for HV use, and more . It explains the fundamentals of vehicle systems and components, and it examines diagnostic principles and the latest techniques employed in effective vehicle maintenance and repair. Diagnostics, or faultfinding, is an essential part of an automotive technician's work, and as automotive systems become increasingly complex there is a greater need for good diagnostic skills. Ideal for students, included throughout the text are useful definitions, key facts, and 'safety first' notes. This text will also assist experienced technicians to further improve their performance and keep up with recent industry developments.
This textbook will help you learn all the skills you need to pass Level 3 and 4 Vehicle Maintenance and Repair courses from City and Guilds, IMI and BTEC, and is also ideal for higher level ASE, AUR and other qualifications. Advanced Automotive Fault Diagnosis covers the fundamentals of vehicle systems and components and explains the latest diagnostic techniques employed in effective vehicle maintenance and repair. Diagnostics, or fault finding, is an essential part of an automotive technician's work, and as automotive systems become increasingly complex there is a greater need for good diagnostics skills. For students new to the subject, this book will help to develop these skills, but will also assist experienced technicians in further improving their performance and keeping up with recent industry developments. In full colour and including examples of the latest technology, this is the guide that no student enrolled on an automotive maintenance and repair course should be without. Also by Tom Denton: Automobile Mechanical and Electrical Systems Tom Denton ISBN: 978-0-08-096945-9 Automobile Electrical and Electronic Systems, Fourth Edition Tom Denton ISBN: 978-0-08-096942-8
Fault-Diagnosis Systems
Proceedings of the International Conference on Energy Equipment Science and Engineering, (ICEESE 2015), May 30-31, 2015, Guangzhou, China
Condition Monitoring with Vibration Signals
Fault-Diagnosis Applications
Proceedings of the International Conference on Machinery, Materials Science and Engineering Application, (MMSE 2015), Wuhan, China, June 27-28 2015
Artificial Intelligence
This volume includes the proceedings of the 2015 International Conference on Information Technology and Intelligent Transportation Systems (ITITS 2015) which was held in Xi'an on December 12-13, 2015. The conference provided a platform for all professionals and researchers from industry and academia to present and discuss recent advances in the field of Information Technology and Intelligent Transportation Systems. The presented information technologies are connected to intelligent transportation systems including wireless communication, computational technologies, floating car data/floating cellular data, sensing technologies, and video vehicle detection. The articles focusing on intelligent transport systems vary in the technologies applied, from basic management systems to more application systems including topics such as emergency vehicle notification systems, automatic road enforcement, collision avoidance systems and some cooperative systems. The conference hosted 12 invited speakers and over 200 participants. Each paper was under double peer reviewed by at least 3 reviewers. This proceedings are sponsored by Shaanxi Computer Society and co-sponsored by Chang'an University, Xi'an University of Technology, Northwestern Poly-technical University, CAS, Shaanxi Sirui Industries Co., LTD.
This book features high-quality, peer-reviewed papers from the 2021 6th International Conference on Intelligent Transportation Engineering (ICITE 2021), held in Beijing, China, on October 29–31, 2021. Presenting the latest developments and technical solutions in Intelligent Transportation engineering, it covers a variety of topics, such as intelligent transportation, traffic control, road networking, intelligent automobile and vehicle operation & management. The book will be a valuable reference for graduate and postgraduate audiences, researchers and engineers, working in Intelligent Transportation Engineering.
In this book, a number of innovative fault diagnosis algorithms in recently years are introduced. These methods can detect failures of various types of system effectively, and with a relatively high significance.
Energy Science and Applied Technology includes contributions on a wide range of topics:- Technologies in geology, mining, oil and gas exploration and exploitation of deposits- Energy transfer and conversion, materials and chemical technologies- Environmental engineering and sustainable development- Electrical and electronic technology, power system
Fault Diagnosis, Prognosis, and Reliability for Electrical Drives
An Introduction from Fault Detection to Fault Tolerance
Photovoltaic Systems
Manufacturing Engineering and Process II
Residual Life Prediction and Optimal Maintenance Decision for a Piece of Equipment
Information Technology and Intelligent Transportation Systems

The goal of this thesis is to build an effective and practical intelligent system to diagnose and prognose aircraft faults. My research focuses on "The MOdeling, DIagnosis and PROgnosis (MODIPRO)" faults in complex systems. This work is a part of a project entitled FUI MODIPRO which is supported by Dassault Aviation. The objective of this project is to research and develop a software solution MODIPRO Version 0 and put it on the aviation market. This software solution can analyze a huge mass of data acquired from a flight and a fleet of aircraft, and the system can deduce rules for diagnosis and prognosis of faults. The system proposed in this thesis has been fully tested by using actual experimental data from a tri-engines system of aircrafts Z1, Z2 and Z3 (supplied by Dassault Aviation). The whole system would be built on a database containing about 67 hours of flight records involving 32 sensors. With the rapid development of modern aero technology and the market demand of high- performance, aircraft systems have become more and more. Thus, the classical diagnosis methods become less available. In the state of the art, unplanned maintenance takes place only at breakdowns, which is too late to observe the faults; the planned maintenance costs too much financial resources and manpower, which needs to set a periodic interval to perform preventive maintenance regardless of the health status of a physical asset. Although Build in Test (BIT) system is used widely, it also costs too much human and financial resource. In a general way the maintenance staffs need to connect the diagnostic box to the aircraft via interface after each flight mission. Because these classical methods often cause the false alarm, the planned maintenance is also indispensable today. In addition, classical diagnostic and prognostic system, such as Condition-Based Maintenance (CBM) and Prognostic Health Management (PHM), analyze the health state of aircrafts when they are on the ground - in the "offline" mode, they can't supervise the aircraft during the mission. In order to resolve these problems and guarantee a high ratio of attendance of aircraft, the system proposed in this thesis uses machine-learning methods to automatically detect, isolate, and even forecast aircraft faults while maintaining reliability and safety. The researches involve signals processing techniques, pattern recognition and classification. On the one hand, the diagnostic model allows the system to deduce the "real" cause of a fault by the observation and the treatment of acquired signals from flight records. On the other hand, the model can provide a progress of degradation of the health state and thus allows anticipating the faults or deferring the needless planned maintenance. The diagnosis system can locate and identify faults and the prognosis system can make the arbitration of a future maintenance plan on basis of the operating needs, the costs of rehabilitation, the risk of fault and the consequences. In addition to this, the system proposed in this thesis can be used not only in the off-line mode when aircraft maintenance occurs, but also in the on-line mode during the aircraft's mission. According to the different situations requirements, the missions of on-line system and off-line system are different. The on-line system is tasked with detecting faults and sending the alarms to the pilot and the Aircraft Ground Center (AGC) in time. The off-line system is obliged to locate the fault(s) and make a detail report to the maintenance center. Additionally, the system needs to analyze the flight data in the past time for the sake of forecasting the fault(s). In order to ensure the reliability of the system, different methods of machine learning are used in parallel as subsystems. These methods can compensate the disadvantages of each other. At first, the data are analyzed and pre-classified by Linear Analysis Discriminant (LDA), a classical and simple approach. On basis of the results, a novel approach of classification called SCM is proposed to improve the accuracy of diagnosis. SCM is different from SVM that requires the support vectors on the boundary of every class to distinguish the categories. SCM seeks the support vectors of true centers and sub-centers of each class during the machine learning. It can make the corresponding centers as the model of the class. The classification of data is simply done by the power distances of the centers. Furthermore, SCM can work for the prognosis analysis and perfectly deal with the nonlinear problem. The evolution of flight data is supervised by each fault model. On the basis of the evolution of the distances from the cloud of data to the centers, the system estimates the tendency of the evolution of data and forecast the probable faults in the future. Beyond a short-term prognosis of faults, the system can also be used to do a long-term evaluation of aircraft healthy state. This is more convincing and efficacious compared to regression methods and statistical methods, which lack the precision of a long-term regression and which require a longer time for data analysis. Although the diagnosis results of SCM and SVM are already satisfied with a correct detection rate that exceeds 95%, Artificial Neural Networks (ANN) are used to build another sub-system, so as to analyze the impact of using different types sensors on the different fault diagnosis and confirm the results from the models SVM and SCM. ANN is a quite different AI technic from SCM and SVM. It is a mathematical model that is inspired by the structure and functional aspects of biological neural networks. A neural network consists of an interconnected group of artificial neurons, and it processes information using a connectionist approach to computation. All the sensors are divided in to different groups corresponding to different types of the sensors. Different combinations of sensors are linked to the neural networks, thus we can study the importance of different types of aircraft sensors by the weights of networks and the diagnosis results of the faults. The methods, as SCM, SVM and ANN, need much time to accomplish machine learning, which cannot do the learning during the flight mission. But, in some cases, it may be necessary to rebuild the diagnosis system, for example if some sensors are broken or lost during the mission. For overcoming this, we added sub-systems based on decision trees (DT) and Gaussian mixture models (GMM), which are easier to interpret, quicker to learn than other data-driven methods, and able to work even with missing pieces of information. The C4.5 algorithm automatically "learns" the best decision tree by performing a search through the set of possible trees according to the available training data. Its needs less time to accomplish the machine learning, so it is also studied and improved in this thesis, and be used to build a subsystem for sake of restructuring the diagnosis system if some sensors or sensors information are lost, especially under the condition of war. GMM can also draw the plan of dysfunctional models and monitor the evolution of the health state of the aircraft in the prognosis system. Unlike expert systems or other conventional methods, the methods developed in this thesis can easily integrate new faults and new rules in the database: there isn't any conflict between the new and old rules. Beyond that, there is another important problem to consider and resolve: some sensors might be already failed before the machine learning. The measurements via sensors in the aircraft are used as the inputs of the system. The nature of the sensors will impact the accuracy and confidence of the diagnosis and prognosis results of the system. Thus, these data should be treated above of all. First, the system needs to check the healthy state of the sensors. If some sensors are broken down, the original system is not applicable. The system will start the emergency application, like fast relearning of the decision tree in order to build a new temporary fault diagnosis system. In addition to that, Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) are used in data mining. They can not only reduce the input data's dimension, but also make a visualization of data in 2D or 3D. It is very useful to observe the evaluation of flux data and to realize prognosis, and it is important for engineers to study the nature of faults. The system described here is not a black box. Although the system is built mainly for combat aircraft, it can be applied to all other types of aircraft, namely civil aircraft. On one hand, the system and its dysfunction models of aircraft faults can be designed to illuminate engineering consulting services responsible for monitoring the condition of aircrafts to ensure the safety of clients. On the other hand, this system can also accumulate the knowledge for re-engineering purposes (including diagnosis operational rules) and perfect the design of new aircrafts.
Being the premier forum for the presentation of new advances and research results in the fields of Industrial Engineering, IEEM 2014 aims to provide a high-level international forum for experts, scholars and entrepreneurs at home and abroad to present the recent advances, new techniques and applications face and face, to promote discussion and interaction among academics, researchers and professionals to promote the developments and applications of the related theories and technologies in universities and enterprises and to establish business or research relations to find global partners for future collaboration in the field of Industrial Engineering. All the goals of the international conference are to fulfill the mission of the series conference which is to review, exchange, summarize and promote the latest achievements in the field of industrial engineering and engineering management over the past year and to propose prospects and vision for the further development.
Machinery Vibration Analysis and Predictive Maintenance provides a detailed examination of the detection, location and diagnosis of faults in rotating and reciprocating machinery using vibration analysis. The basics and underlying physics of vibration signals are first examined. The acquisition and processing of signals is then reviewed followed by a discussion of machinery fault diagnosis using vibration analysis. Hereafter the important issue of rectifying faults that have been identified using vibration analysis is covered. The book also covers the other techniques of predictive maintenance such as oil and particle analysis, ultrasound and infrared thermography. The latest approaches and equipment used together with the latest techniques in vibration analysis emerging from current research are also highlighted. 1. Understand the basics of vibration measurement 2. Apply vibration analysis for different machinery faults 3. Diagnose machinery-related problems with vibration analysis techniques
This book presents the main concepts, state of the art, advances, and case studies of fault detection, diagnosis, and prognosis. This topic is a critical variable in industry to reach and maintain competitiveness. Therefore, proper management of the corrective, predictive, and preventive politics in any industry is required. This book complements other subdisciplines such as economics, finance, marketing, decision and risk analysis, engineering, etc. The book presents real case studies in multiple disciplines. It considers the main topics using prognostic and subdiscipline techniques. It is essential to link these topics with the areas of finance, scheduling, resources, downtime, etc. to increase productivity, profitability, maintainability, reliability, safety, and availability, and reduce costs and downtime. Advances in mathematics, modeling, computational techniques, dynamic analysis, etc. are employed analytically. Computational techniques, dynamic analysis, probabilistic methods, and mathematical optimization techniques are expertly blended to support the analysis of prognostic problems with defined constraints and requirements. The book is

intended for graduate students and professionals in industrial engineering, business administration, industrial organization, operations management, applied microeconomics, and the decisions sciences, either studying maintenance or needing to solve large, specific, and complex maintenance management problems as part of their jobs. The work will also be of interest to researches from academia.

Methods for System Self-Organization, Learning, and Adaptation

Compressive Sampling and Learning Algorithms for Rotating Machines

Methodologies and Practices

Condition Monitoring and Control for Intelligent Manufacturing

Advanced Methods, Decision Support Tools and Real-World Applications

Advanced Automotive Fault Diagnosis

Intelligent Fault Diagnosis and Remaining Useful Life Prediction of Rotating MachineryButterworth-Heinemann

This book presents the main advanced signal processing techniques for fault detection and diagnosis in electromechanical systems. It focuses on presenting these advanced tools from time-frequency representation and time-scale analysis to demodulation techniques, including innovative and recently developed approaches.

This book addresses remaining life prediction and predictive maintenance of equipment. It systematically summarizes the key research findings made by the author and his team and focuses on how to create equipment performance degradation and residual life prediction models based on the performance monitoring data produced by currently used and historical equipment. Some of the theoretical results covered here have been used to make remaining life predictions and maintenance-related decisions for aerospace products such as gyros and platforms. Given its scope, the book offers a valuable reference guide for those pursuing theoretical or applied research in the areas of fault diagnosis and fault-tolerant control, remaining life prediction, and maintenance decision-making.

The subject of machine condition monitoring and fault diagnosis as a part of system maintenance has gained a lot of interest due to the potential benefits to be learned from reduced maintenance budgets, enhanced productivity and improved machine availability. Artificial intelligence (AI) is a successful method of machine condition monitoring and fault diagnosis since these techniques are used as tools for routine maintenance. This chapter attempts to summarize and review the recent research and developments in the field of signal analysis through artificial intelligence in machine condition monitoring and fault diagnosis. Intelligent systems such as artificial neural network (ANN), fuzzy logic system (FLS), genetic algorithms (GA) and support vector machine (SVM) have previously developed many different methods. However, the use of acoustic emission (AE) signal analysis and AI techniques for machine condition monitoring and fault diagnosis is still rare. In the future, the applications of AI in machine condition monitoring and fault diagnosis still need more encouragement and attention due to the gap in the literature.

Machinery, Materials Science and Engineering Applications

Fault Diagnosis and Prognosis System for Aircraft

Electrical Signature Analysis

Introduction of Intelligent Machine Fault Diagnosis and Prognosis

Advances in Engineering Materials and Applied Mechanics

Automotive Technology: Vehicle Maintenance and Repair

Supervision, condition-monitoring, fault detection, fault diagnosis and fault management play an increasing role for technical processes and vehicles in order to improve reliability, availability, maintenance and lifetime. For safety-related processes fault-tolerant systems with redundancy are required in order to reach comprehensive system integrity. This book is a sequel of the book “Fault-Diagnosis Systems” published in 2006, where the basic methods were described. After a short introduction into fault-detection and fault-diagnosis methods the book shows how these methods can be applied for a selection of 20 real technical components and processes as examples, such as: Electrical drives (DC, AC) Electrical actuators Fluidic actuators (hydraulic, pneumatic) Centrifugal and reciprocating pumps Pipelines (leak detection) Industrial robots Machine tools (main and feed drive, drilling, milling, grinding) Heat exchangers Also realized fault-tolerant systems for electrical drives, actuators and sensors are presented. The book describes why and how the various signal-model-based and process-model-based methods were applied and which experimental results could be achieved. In several cases a combination of different methods was most successful. The book is dedicated to graduate students of electrical, mechanical, chemical engineering and computer science and for engineers.

This book provides a complete picture of several decision support tools for predictive maintenance. These include embedding early anomaly/fault detection, diagnosis and reasoning, remaining useful life prediction (fault prognostics), quality prediction and self-reaction, as well as optimization, control and self-healing techniques. It shows recent applications of these techniques within various types of industrial (production/utilities/equipment/plants/smart devices, etc.) systems addressing several challenges in Industry 4.0 and different tasks dealing with Big Data Streams, Internet of Things, specific infrastructures and tools, high system dynamics and non-stationary environments . Applications discussed include production and manufacturing systems, renewable energy production and management, maritime systems, power plants and turbines, conditioning systems, compressor valves, induction motors, flight simulators, railway infrastructures, mobile robots, cyber security and Internet of Things. The contributors go beyond state of the art by placing a specific focus on dynamic systems, where it is of utmost importance to update system and maintenance models on the fly to maintain their predictive power.

Provides an extensive, up-to-date treatment of techniques used for machine condition monitoring Clear and concise throughout, this accessible book is the first to be wholly devoted to the field of condition monitoring for rotating machines using vibration signals. It covers various feature extraction, feature selection, and classification methods as well as their applications to machine vibration datasets. It also presents new methods including machine learning and compressive sampling, which help to improve safety, reliability, and performance. Condition Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines starts by introducing readers to Vibration Analysis Techniques and Machine Condition Monitoring (MCM). It then offers readers sections covering: Rotating Machine Condition Monitoring using Learning Algorithms; Classification Algorithms; and New Fault Diagnosis Frameworks designed for MCM. Readers will learn signal processing in the time-frequency domain, methods for linear subspace learning, and the basic principles of the learning method Artificial Neural Network (ANN). They will also discover recent trends of deep learning in the field of machine condition monitoring, new feature learning frameworks based on compressive sampling, subspace learning techniques for machine condition monitoring, and much more. Covers the fundamental as well as the state-of-the-art approaches to machine condition monitoring—guiding readers from the basics of rotating machines to the generation of knowledge using vibration signals Provides new methods, including machine learning and compressive sampling, which offer significant improvements in accuracy with reduced computational costs Features learning algorithms that can be used for fault diagnosis and prognosis Includes previously and recently developed dimensionality reduction techniques and classification algorithms Condition Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines is an excellent book for research students, postgraduate students, industrial practitioners, and researchers.

The book covers various issues related to machinery condition monitoring, signal processing and conditioning, instrumentation and measurements, faults for induction motors failures, new trends in condition monitoring, and the fault identification process using motor currents electrical signature analysis. It aims to present a new non-invasive and non-intrusive condition monitoring system, which has the capability to detect various defects in induction motor at incipient stages within an arbitrary noise conditions. The performance of the developed system has been analyzed theoretically and experimentally under various loading conditions of the motor. Covers current and new approaches applied to fault diagnosis and condition monitoring. Integrates concepts and practical implementation of electrical signature analysis. Utilizes LabVIEW tool for condition monitoring problems. Incorporates real-world case studies. Paves way a technology potentially for prescriptive maintenance via IIoT.

Fault Detection

Preventive Maintenance and Fault Diagnosis

Artificial Intelligence-Based Fault Diagnosis and Predictive Maintenance

Industrial, Aerospace and Automotive Applications

Vibration-based Condition Monitoring

Machinery Condition Monitoring

This conference proceeding contains papers presented at the 6th International Conference on Machinery, Materials Science and Engineering Applications (MMSE 2016), held 28-30 October, 2016 in Wuhan, China. The conference proceeding contributions cover a large number of topics, both theoretical and applied, including Material science, Electrical Engineering and Automation Control, Electronic Engineering, Applied Mechanics, Mechanical Engineering, Aerospace Science and Technology, Computer Science and Information technology and other related engineering topics. MMSE provides a perfect platform for scientists and engineering researchers to exchange ideas, build cooperative relationships and discuss the latest scientific achievements. MMSE will be of interest for academics and professionals working in a wide range of industrial, governmental and academic sectors, including Material Science, Electrical and Electronic Engineering, Information Technology and Telecommunications, Civil Engineering, Energy Production, Manufacturing, Mechanical Engineering, Nuclear Engineering, Transportation and Aerospace Science and Technology.

"Without doubt the best modern and up-to-date text on the topic, wirtten by one of the world leading experts in the field. Should be on the desk of any practitioner or researcher involved in the field of Machine Condition Monitoring" Simon Braun, Israel Institute of Technology Explaining complex ideas in an easy to understand way, Vibration-based Condition Monitoring provides a comprehensive survey of the application of vibration analysis to the condition monitoring of machines. Reflecting the natural progression of these systems by presenting the fundamental material and then moving onto detection, diagnosis and prognosis, Randall presents classic and state-of-the-art research results that cover vibration signals from rotating and reciprocating machines; basic signal processing techniques; fault detection; diagnostic techniques, and prognostics. Developed out of notes for a course in machine condition monitoring given by Robert Bond Randall over ten years at the University of New South Wales, Vibration-based Condition Monitoring: Industrial, Aerospace and Automotive Applications is essential reading for graduate and postgraduate students/ researchers in machine condition monitoring and diagnostics as well as condition monitoring practitioners and machine manufacturers who want to include a machine monitoring service with their product. Includes a number of exercises for each chapter, many based on Matlab, to illustrate basic points as well as to facilitate the use of the book as a textbook for courses in the topic. Accompanied by a website www.wiley.com/go/randall housing exercises along with data sets and implementation code in Matlab for some of the methods as well as other pedagogical aids. Authored by an internationally recognised authority in the area of condition monitoring.

"This book focuses on the latest innovations in the process of manufacturing in engineering"--Provided by publisher.

An insightful treatment of present and emerging technologies in fault diagnosis and failure prognosis In Fault Diagnosis, Prognosis, and Reliability for Electrical Machines and Drives, a team of distinguished researchers delivers a comprehensive exploration of current and emerging approaches to fault diagnosis and failure prognosis of electrical machines and drives. The authors begin with foundational background, describing the physics of failure, the motor and drive designs and components that affect failure and signals, signal processing, and analysis. The book then moves on to describe the features of these signals and the methods commonly used to extract these features to diagnose the health of a motor or drive, as well as the methods used to identify the state of health and differentiate between possible faults or their severity. Fault Diagnosis, Prognosis, and Reliability for Electrical Machines and Drives discusses the tools used to recognize trends towards failure and the estimation of remaining useful life. It addresses the relationships between fault diagnosis, failure prognosis, and fault mitigation. The book also provides: A thorough introduction to the modes of failure, how early failure precursors manifest themselves in signals, and how features extracted from these signals are processed A comprehensive exploration of the fault diagnosis, the results of characterization, and how they used to predict the time of failure and the confidence interval associated with it A focus on medium-sized drives, including induction, permanent magnet AC, reluctance, and new machine and drive types Perfect for researchers and students who wish to study or practice in the rea of electrical machines and drives, Fault Diagnosis, Prognosis, and Reliability for Electrical Machines and Drives is also an indispensable resource for researchers with a background in signal processing or statistics.

Computer-aided Maintenance

Advances in Energy Science and Equipment Engineering

Fault Diagnosis, Failure Prognosis and Their Effects on the Reliability of Electrical Machines, Drives and Power Electronics

Advanced Condition Monitoring and Fault Diagnosis of Electric Machines

Proceedings of the 21st International Conference on Industrial Engineering and Engineering Management 2014

Intelligent Fault Diagnosis and Remaining Useful Life Prediction of Rotating Machinery provides a comprehensive introduction of intelligent fault diagnosis and RUL prediction based on the current achievements of the author's research group. The main contents include multi-domain signal processing and feature extraction, intelligent diagnosis models, clustering algorithms, hybrid intelligent diagnosis strategies, and RUL prediction approaches, etc. This book presents fundamental theories and advanced methods of identifying the occurrence, locations, and degrees of faults, and also includes information on how to predict the RUL of rotating machinery. Besides experimental demonstrations, many application cases are presented and illustrated to test the methods mentioned in the book. This valuable reference provides an essential guide on machinery fault diagnosis that helps readers understand basic concepts and fundamental theories. Academic researchers with mechanical engineering or computer science backgrounds, and engineers or practitioners who are in charge of machine safety, operation, and maintenance will find this book very useful. Provides a detailed background and roadmap of intelligent diagnosis and RUL prediction of rotating machinery, involving fault mechanisms, vibration characteristics, health indicators, and diagnosis and prognostics Presents basic theories, advanced methods, and the latest contributions in the field of intelligent fault diagnosis and RUL prediction Includes numerous application cases, and the methods, algorithms, and models introduced in the book are demonstrated by industrial experiences

Artificial intelligence (AI) is taking an increasingly important role in our society. From cars, smartphones, airplanes, consumer applications, and even medical equipment, the impact of AI is changing the world around us. The ability of machines to demonstrate advanced cognitive skills in taking decisions, learn and perceive the environment, predict certain behavior, and process written or spoken languages, among other skills, makes this discipline of paramount importance in today's world. Although AI is changing the world for the better in many applications, it also comes with its challenges. This book encompasses many applications as well as new techniques, challenges, and opportunities in this fascinating area.

This book gives comprehensive insight to the fault detection techniques implemented for photovoltaic panels including predictive maintenance needed to improve the performance of solar PV systems using Artificial Intelligence techniques. It explains fault identification algorithms and their significance in real-time power system applications.

Advances in Energy Equipment Science and Engineering contains selected papers from the 2015 International Conference on Energy Equipment Science and Engineering (ICEESE 2015, Guangzhou, China, 30-31 May 2015). The topics covered include:- Advanced design technology- Energy and chemical engineering- Energy and environmental engineering- Energy scien

A Maintenance Management System with Rule-based Expert System for Machine Fault Diagnosis

Energy Science and Applied Technology

Seminar Proceedings

Condition Monitoring and Faults Diagnosis of Induction Motors

Model-Based Condition Monitoring: Actuators, Drives, Machinery, Plants, Sensors, and Fault-tolerant Systems

Manufacturing Intelligence for Industrial Engineering: Methods for System Self-Organization, Learning, and Adaptation

In today's business environment, reliability and maintenance drastically affect the three key elements of competitiveness - quality, cost, and product lead time. Well-maintained machines hold tolerances better, help reduce scrap and rework, and raise consistency and quality of the part in addition to cutting total production costs. Today, many factories are still performing maintenance on equipment in a reactive manner due to a lack of understanding about machine performance behaviour. To improve production efficiency, computer-aided maintenance and diagnostic methodology must be applied effectively in manufacturing. This book focuses on the fundamental principles of predictive maintenance and diagnostic engineering. In addition to covering the relevant theory, techniques and methodologies in maintenance engineering, the book also provides numerous case studies and examples illustrating the successful application of the principles and techniques outlined.

This utterly comprehensive work is thought to be the first to integrate the literature on the physics of the failure of complex systems such as hospitals, banks and transport networks. It has chapters on particular aspects of maintenance written by internationally-renowned researchers and practitioners. This book will interest maintenance engineers and managers in industry as well as researchers and graduate students in maintenance, industrial engineering and applied mathematics.

Machinery Vibration Analysis and Predictive Maintenance provides a detailed examination of the detection, location and diagnosis of faults in rotating and reciprocating machinery using vibration analysis. The basics and underlying physics of vibration signals are first examined. The acquisition and processing of signals is then reviewed followed by a discussion of machinery fault diagnosis using vibration analysis. Hereafter the important issue of rectifying faults that have been identified using vibration analysis is covered. The book also covers the other techniques of predictive maintenance such as oil and particle analysis, ultrasound and infrared thermography. The latest approaches and equipment used together with the latest

techniques in vibration analysis emerging from current research are also highlighted. Understand the basics of vibration measurement Apply vibration analysis for different machinery faults Diagnose machinery-related problems with vibration analysis techniques

Collection of selected, peer reviewed papers from the ICMEP 2013 International Conference on Manufacturing Engineering and Process, April 13-14, 2013, Vancouver, Canada. The 373 papers are grouped as follows: Chapter 1: Advanced Materials Engineering and Technology; Chapter 2: General Mechanical Engineering; Chapter 3: Design Technology and Engineering; Chapter 4: Applied Thermodynamics, Heat Transfer, Energy Conversion; Chapter 5: Electrical Engineering and Electric Machines; Chapter 6: Power System and Energy Engineering: Its Applications; Chapter 7: Instrumentation, Measurement Technologies, Analysis and Methodology; Chapter 8: Electronics and Integrated Circuits, Embedded Technology and Applications; Chapter 9: Mechatronics and Robotics; Chapter 10: Modern Control, Automation and Reverse Engineering; Chapter 11: New Technology, Method and Technique in Civil Engineering; Chapter 12: Manufacturing and Industrial Engineering, Management Applications; Chapter 13: Mathematics - in Particular, Calculus, Differential Equations, Statistics, and Linear Algebra; Chapter 14: Signal Processing and Data Mining; Chapter 15: Information Technologies and Networks: Its Applications.

Signal Processing for Fault Detection and Diagnosis in Electric Machines and Systems

Proceedings of the 2nd International Conference on Energy Science and Applied Technology (ESAT 2015)

Fault Diagnosis and Detection

Volume 2, Proceedings of the 2015 International Conference on Information Technology and Intelligent Transportation Systems ITITS 2015, held December 12-13, 2015, Xi'an China

Emerging Trends and Applications

Intelligent Fault Diagnosis and Remaining Useful Life Prediction of Rotating Machinery

The reliability of induction motors is a major requirement in many industrial applications. It is especially important where an unexpected breakdown might result in the interruption of critical services such as military operations, transportation, aviation, and medical applications. Advanced Condition Monitoring and Fault Diagnosis of Electric Machines is a collection of innovative research on various issues related to machinery condition monitoring, signal processing and conditioning, instrumentation and measurements, and new trends in condition monitoring. It also pays special attention to the fault identification process. While highlighting topics including spectral analysis, electrical engineering, and bearing faults, this book is an ideal reference source for electrical engineers, mechanical engineers, researchers, and graduate-level students seeking current research on various methods of maintaining machinery.

With the rapid development of Machinery, Materials Science and Engineering Application, discussion on new ideas related mechanical engineering and materials science arise. In this proceedings volume the author(s) are focussed on Machinery, Materials Science and Engineering Applications and other related topics. The Conference has pro

Mass production companies have become obliged to reduce their production costs and sell more products with lower profit margins in order to survive in competitive market conditions. The complexity and automation level of machinery are continuously growing. This development calls for some of the most critical issues that are reliability and dependability of automatic systems. In the future, machines will be monitored remotely, and computer-aided techniques will be employed to detect faults in the future, and also there will be unmanned factories where machines and systems communicate to each other, detect their own faults, and can remotely intercept their faults. The pioneer studies of such systems are fault diagnosis studies. Thus, we hope that this book will contribute to the literature in this regard.

Intelligent Fault Diagnosis and Prognosis for Engineering Systems

Practical Machinery Vibration Analysis and Predictive Maintenance

Artificial Intelligence Application in Machine Condition Monitoring and Fault Diagnosis

Proceedings of the 6th International Conference on Machinery, Materials Science and Engineering Applications (MMSE 2016), Wuhan, China, October 26-29 2016