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The MANTIS Book

Cyber Physical System Based Proactive Collaborative Maintenance

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Description:

In recent years, a considerable amount of effort has been devoted, both in industry and academia, to improving maintenance. Time is a critical factor in maintenance, and efforts are placed to monitor, analyze, and visualize machine or asset data in order to anticipate to any possible failure, prevent damage, and save costs.

The MANTIS Book aims to highlight the underpinning fundamentals of Condition-Based Maintenance related conceptual ideas, an overall idea of preventive maintenance, the economic impact and technical solution.

The core content of this book describes the outcome of the Cyber-Physical System based Proactive Collaborative Maintenance project, also known as MANTIS, and funded by EU ECSEL Joint Undertaking under Grant Agreement nº 662189. The ambition has been to support the creation of a maintenance-oriented reference architecture that support the maintenance data lifecycle, to enable the use of novel kinds of maintenance strategies for industrial machinery. The key enabler has been the fine blend of collecting data through Cyber-Physical Systems, and the usage of machine learning techniques and advanced visualization for the enhanced monitoring of the machines.

Topics discussed include, in the context of maintenance: Cyber-Physical Systems, Communication Middleware, Machine Learning, Advanced Visualization, Business Models, Future Trends. An important focus of the book is the application of the techniques in real world context, and in fact all the work is driven by the pilots, all of them centered on real machines and factories.

This book is suitable for industrial and maintenance managers that want to implement a new strategy for maintenance in their companies. It should give readers a basic idea on the first steps to implementing a maintenance-oriented platform or information system.

Keywords: Proactive Maintenance, European Project, Collaborative Maintenance, Distributed Architecture, Event-based Middleware, Cyber Physical Systems, Sensors, Machine Learning, Data Analysis, Advanced Visualization, Use Case, Real World, Business Models, Future of Maintenance, Industry 4.0, Digitising European Industry, Digital Single Market