

Preface

Discrete Event Systems: Diagnosis and Diagnosability addresses the problem of fault diagnosis of discrete event systems (DES). This book provides the basic techniques and approaches necessary for the design of an efficient fault diagnosis system for a wide range of modern engineering applications. The different techniques and approaches are classified according to several criteria such as: modeling tools (Automata, Petri nets) that is used to construct the model; the information (qualitative based on events occurrences and/or states outputs, quantitative based on signal processing and data analysis) that is needed to analyze and achieve the diagnosis; the decision structure (centralized, decentralized, distributed) that is required to achieve the diagnosis; The goal of this classification is to select the efficient method to achieve the fault diagnosis according to the application constraints. Then the book focuses on the centralized and decentralized event based diagnosis approaches using formal language and automata as modeling tool. This book includes illustrated examples of the presented methods and techniques as well as a discussion on the application of these methods on several real-world problems. This book: -) covers the required notions, definitions and backgrounds to understand the problem of fault diagnosis of discrete event systems (DES), -) includes multiple illustration examples in various application domains and multiple illustration examples and -) discusses the links between different methods and techniques for the fault diagnosis of DES. The author is very grateful to Brett Kurzman for establishing the contract with Springer Verlag and supporting the author in any organizational aspects. The author would like to thank Rebecca Hytowitz for the text setting including the figures and tables in camera-ready form.

Keywords: Discrete event systems modeling · Discrete event systems diagnosis methods · Diagnosability and co-diagnosability analysis



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