



Diagnosis of Discrete-Event Systems

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linear control theory, including networked and distributed systems, hybrid dynamical systems and discrete-event systems

Abstract

The paper gives an introduction to fault diagnosis of discrete-event systems and surveys the main principles that are used by the method published so far. According to the principle of consistency-based diagnosis, methods for detecting and identifying faults in a dynamical system are based on the investigation whether the measured sequences of input and output symbols are consistent with the model of the faultless or the faulty system. As usually no a-priori information about the initial state of the system is available, the diagnostic algorithm has to solve a state observation problem, which will be described at the beginning of the presentation. The basic idea of this method is then used for diagnostic purposes and later generalised to nondeterministic, stochastic and timed automata. Applications to industrial processes illustrate the effectiveness of the method.

Biography

Jan Lunze obtained the Ph.D. and the Dr.Sc. degrees (habilitation), both from the Technical University Ilmenau in 1979 and 1983. Between 1992 and 2001 he was a professor of control engineering at the Technical University Hamburg-Harburg. Now he is a professor of automatic control and the head of the Institute of Automation and Computer Control at Ruhr-University Bochum, where he teaches system and control theory. Professor Lunze's research interests are in linear control theory, particularly in the fields of networked and distributed systems, hybrid dynamical systems and discrete-event systems. He is the author and co-author of numerous research papers and has written several books, including *Feedback Control of Large-Scale Systems* (Prentice-Hall 1992), *Regelungstechnik* (Springer, 9 editions since 1996), *Diagnosis and Fault-Tolerant Control* (Springer 2003, with Blanke, Kinnaert, Staroswiecki), and edited the *Handbook of Hybrid Systems Control* (Cambridge University Press, 2009).