

|                         |  |
|-------------------------|--|
| 1. Record Nr.           | UNINA9910739449803321  |
| Autore                  | Busbait Monther  |
| Titolo                  | Decision Trees for Fault Diagnosis in Circuits and Switching Networks /<br>/ by Monther Busbait, Mikhail Moshkov, Albina Moshkova, Vladimir<br>Shevtchenko   |
| Pubbl/distr/stampa      | Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2023  |
| ISBN                    | 9783031390319<br>3031390318  |
| Edizione                | [1st ed. 2023.]  |
| Descrizione fisica      | 1 online resource (135 pages)  |
| Collana                 | Studies in Systems, Decision and Control, , 2198-4190 ; ; 493  |
| Altri autori (Persone)  | MoshkovMikhail<br>MoshkovaAlbina<br>ShevtchenkoVladimir  |
| Disciplina              | 621.3192   |
| Soggetti                | Automation<br>Engineering mathematics<br>Engineering - Data processing<br>Bioengineering<br>Mathematical and Computational Engineering Applications<br>Biological and Physical Engineering   |
| Lingua di pubblicazione | Inglese  |
| Formato                 | Materiale a stampa   |
| Livello bibliografico   | Monografia   |
| Nota di contenuto       | Introduction -- Diagnosis of constant Faults at Inputs of Gates in<br>Circuits -- Diagnosis of Embedding Faults in Circuits -- Diagnosis of<br>Extensions of Constant Faults in Circuits -- Diagnosis of Retaining<br>Faults in Circuits -- Diagnosis of Constant Faults in Switching<br>Networks.   |
| Sommario/riassunto      | In this book, we study decision trees for fault diagnosis in circuits and<br>switching networks, which are among the most fundamental models for<br>computing Boolean functions. We consider two main cases: when the<br>scheme (circuit or switching network) has the same mode of operation<br>for both calculation and diagnostics, and when the scheme has two<br>modes of operation—normal for calculation and special for diagnostics.<br>In the former case, we get mostly negative results, including<br>superpolynomial lower bounds on the minimum depth of diagnostic |

decision trees depending on scheme complexity and the NP-hardness of construction diagnostic decision trees. In the latter case, we describe classes of schemes and types of faults for which decision trees can be effectively used to diagnose schemes, when they are transformed into so-called iteration-free schemes. The tools and results discussed in this book help to understand both the possibilities and challenges of using decision trees to diagnose faults in various schemes. The book is useful to specialists both in the field of theoretical and technical diagnostics. It can also be used for the creation of courses for graduate students.

---