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Nota di contenuto	Cover; Title Page; Contents; Preface; Introduction; Chapter 1. State of the Art in Fault-tolerantControl; 1.1. Fault detection and isolation; 1.2. Control reconfiguration; 1.3. Sets in control; 1.3.1. Set generalities; 1.3.2. Set operations; 1.3.3. Dynamic systems and sets; 1.3.4. Other set-theoretic issues; 1.4. Existing set-theoretic methods in FTC; Chapter 2. Fault Detection and Isolation inMultisensor Systems; 2.1. Problem statement; 2.1.1. Multisensor scheme; 2.1.2. Fault scenarios; 2.2. Fault detection and isolation; 2.2.1. Partition of the sensor indices; 2.2.2. Residual sets for FDI 2.3. Recovery mechanism2.3.1. Necessary and sufficient conditions; 2.3.2. Construction of set SR; 2.3.3. Inclusion time computation; Chapter 3. Residual Generation and ReferenceGovernor Design; 3.1. Residual signals; 3.1.1. Measurement equations residual; 3.1.2. Observer-based residual; 3.1.3. Receding observation window-based residual; 3.2. Reference governor synthesis; Chapter 4. Reconfiguration of the ControlMechanism for Fault-tolerant Control; 4.1. Active FTC

with fix gain feedback; 4.1.1. Fix gain feedback synthesis; 4.1.2. Reference governor synthesis; 4.2. Active FTC with MPC control
4.2.1. A classic MPC design4.2.2. Toward a cooperative view of FTC-MPC; 4.3. Passive FTC control; 4.3.1. Quadratic cost function; 4.3.2. Penalty function using the gauge function of the healthy invariant set;
Chapter 5. Related Problems and Applications; 5.1. Set theoretic issues; 5.1.1. Over-approximation methods; 5.1.2. Convergence time issues; 5.1.3. Cyclic invariance for dwell-time systems; 5.2. Illustrative examples; 5.2.1. Fault detection and isolation; 5.2.2. Recovery mechanism; 5.2.3. Feasible reference generation; 5.2.4. Fault-tolerant control results; Conclusions; Bibliography
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Sommario/riassunto

Fault-tolerant control theory is a well-studied topic but the use of the sets in detection, isolation and/or reconfiguration is rather tangential. The authors of this book propose a systematic analysis of the set-theoretic elements and devise approaches which exploit advanced elements within the field. The main idea is to translate fault detection and isolation conditions into those conditions involving sets. Furthermore, these are to be computed efficiently using positive invariance and reachability notions. Constraints imposed by exact fault control are used to define feasible refere
