

## Filter Design for System Modeling, State Estimation and Fault Diagnosis

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Filter Design for System Modeling, State Estimation and Fault Diagnosis analyzes the latest methods in the design of filters for system modeling, state estimation and fault detection with the intention of providing a new perspective of both theoretical and practical aspects. This book also includes fault diagnosis techniques for unknown but bounded systems, their real applications on modeling and fault diagnosis for lithium battery systems, DC-DC converters and spring damping systems. It proposes new methods based on zonotopic Kalman filtering, a variety of state estimation methods of zonotope and its derived algorithms, a state estimation method based on convex space, set inversion interval observer filtering-based guaranteed fault estimation and a novel interval observer filtering-based fault diagnosis. The methods presented in this text are more practical than the common probabilistic-based algorithms, since these can be applied in unknown but bounded noisy environments. This book will be an essential read for students, scholars and engineering professionals who are interested in filter design, system modeling, state estimation, fault diagnosis and related fields.

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