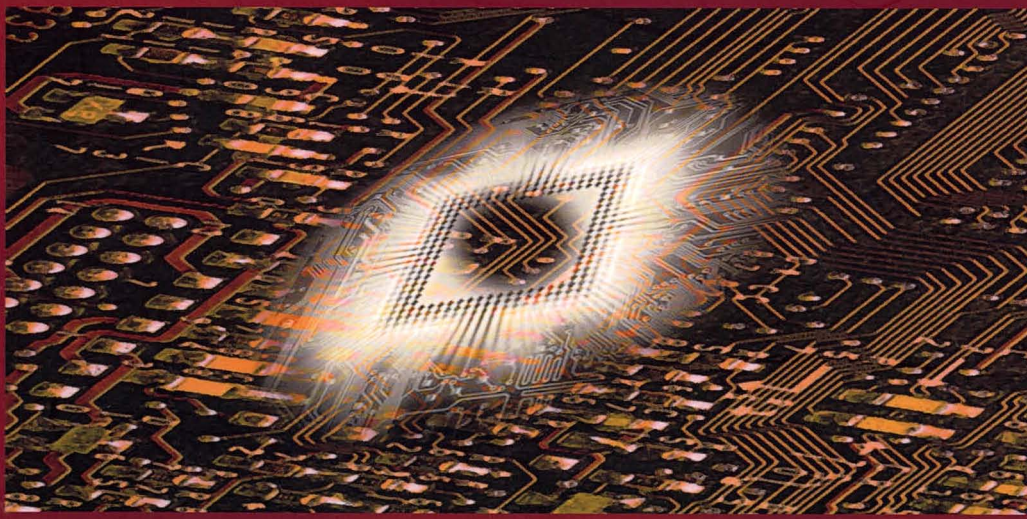
COMPUTATIONAL INTELLIGENCE IN ROBUST CONTROL

Theory and Applications



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Chapter 1

COMPUTATIONAL INTELLIGENCE IN ROBUST CONTROL: A REVIEW

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This chapter provides a brief introduction to robust control design and computational intelligence (CI) approaches. The chapter focuses on three categories of CI, namely soft-computing, biological-inspired algorithm and multi objective techniques. A literature review on various echniques from each category as well as on intelligent robust control is presented. This chapter serves as an introduction to the topics covered by the rest of the book. As each topic discussed in this chapter is very vast on its own, more advanced and/or interested readers on the specific topic(s) can refer to references provided for further reading.

1.0 Robust Control Design

Robust control is a branch of control system design which explicitly deals with system uncertainties and performance under various disturbances, parameter variations and any other uncertainties, including noise. Robustness issue is the main concern in robust control design and addressed explicitly in the controller design. In control theory, a controller is designed to stabilize an unstable system and/or to achieve certain design specifications in the