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R. Kumar, V.K. Garg

## **Modeling and Control of Logical Discrete Event Systems**

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The field of discrete event systems has emerged to provide a formal treatment of many of the man-made systems such as manufacturing systems, communication networks, automated traffic systems, database management systems, and computer systems that are event-driven, highly complex, and not amenable to the classical treatments based on differential or difference equations. Discrete event systems is a growing field that utilizes many interesting mathematical models and techniques. In this book we focus on a high level treatment of discrete event systems, where the order of events, rather than their occurrence times, is the principal concern. Such treatment is needed to guarantee that the system under study meets desired logical goals. In this framework, discrete event systems are modeled by formal languages or, equivalently, by state machines. The field of logical discrete event systems is an interdisciplinary field—it includes ideas from computer science, control theory, and operations research. Our goal is to bring together in one book the relevant techniques from these fields. This is the first book of this kind, and our hope is that it will be useful to professionals in the area of discrete event systems since most of the material presented has appeared previously only in journals. The book is also designed for a graduate level course on logical discrete event systems. It contains all the necessary background material in formal language theory and lattice theory. The only prerequisite is some degree of "mathematical maturity".