Hardware-Software Co-Synthesis of Distributed Embedded Systems
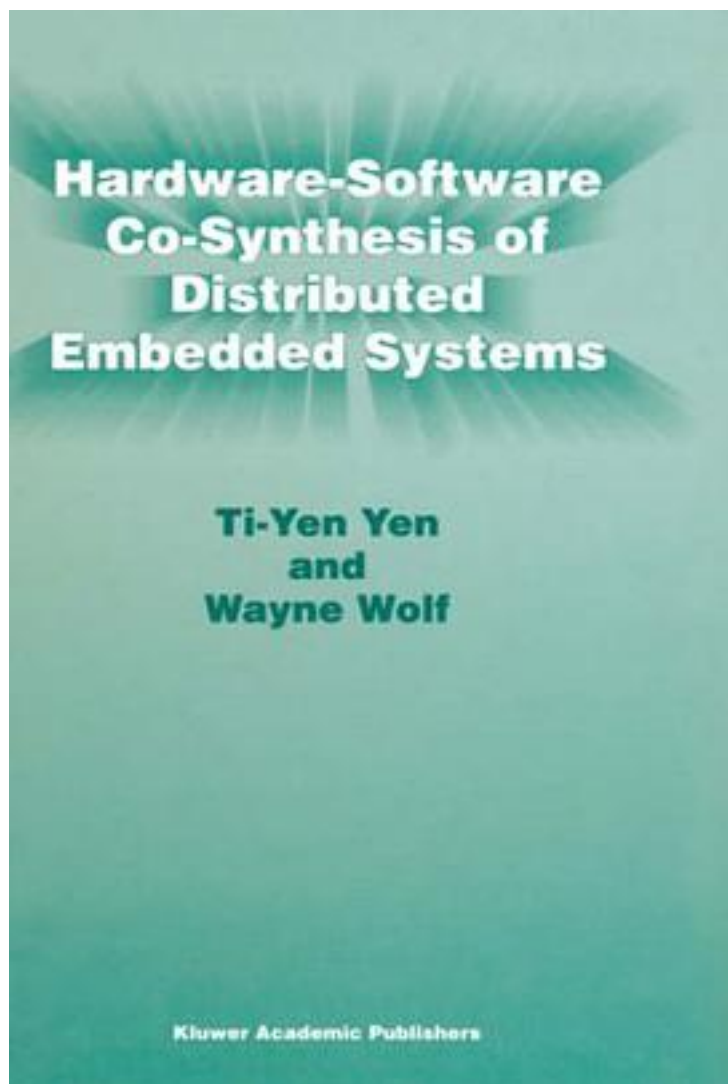

Hardware-Software Co-Synthesis of Distributed Embedded Systems_下载链接1_

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Embedded computer systems use both off-the-shelf microprocessors and application-specific integrated circuits (ASICs) to implement specialized system functions. Examples include the electronic systems inside laser printers, cellular phones, microwave ovens, and an automobile anti-lock brake controller. Embedded computing is unique because it is a co-design problem - the hardware engine and application software architecture must be designed simultaneously.
Hardware-Software Co-Synthesis of Distributed Embedded Systems proposes new techniques such as fixed-point iterations, phase adjustment, and separation analysis to efficiently estimate tight bounds on the delay required for a set of multi-rate processes preemptively scheduled on a real-time reactive distributed system. Based on the delay bounds, a gradient-search co-synthesis algorithm with new techniques such as sensitivity analysis, priority prediction, and idle- processing elements elimination are developed to select the number and types of processing elements in a distributed engine, and determine the allocation and scheduling of processes to processing elements. New communication modeling is also presented to analyze communication delay under interaction of computation and communication, allocate interprocessor communication links, and schedule communication.
Hardware-Software Co-Synthesis of Distributed Embedded Systems is the first book to describe techniques for the design of distributed embedded systems, which have arbitrary hardware and software topologies. The book will be of interest to: academic researchers for personal libraries and advanced-topics courses in co-design as well as industrial designers who are building high-performance, real-time embedded systems with multiple processors.

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