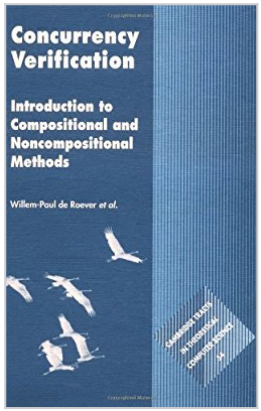

Concurrency Verification: Introduction to Compositional and Non-compositional Methods (Cambridge Tracts in Theoretical Computer Science)

By Willem-Paul de Roever, Frank de Boer, Ulrich Hanneman, Jozef Hooman, Yassine Lakhnech, Mannes Poel, Job Zwiers

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This is a systematic and comprehensive introduction both to compositional proof methods for the state-based verification of concurrent programs, such as the assumption-commitment and rely-guarantee paradigms, and to noncompositional methods, whose presentation culminates in an exposition of the communication-closed-layers (CCL) paradigm for verifying network protocols. Compositional concurrency verification methods reduce the verification of a concurrent program to the independent verification of its parts. If those parts are tightly coupled, one additionally needs verification methods based on the causal order between events. These are presented using CCL. The semantic approach followed here allows a systematic presentation of all these concepts in a unified framework which highlights essential concepts. The book is self-contained, guiding the reader from advanced undergraduate level to the state-of-the-art. Every method is illustrated by examples, and a picture gallery of some of the subject's key figures complements the text.

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