Architecture Design and Validation Methods. E. Borger(Ed.)

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This is a compact, well organised and very readble volume by eminent specialists in the theory and practice of specification, design, validation and verification of hardware/software architectures, with valuable bibliographical references within an appealing cover. Because of the diversity of papers in the book, only some struck a chord with the reviewer's own research interests.

R. Camposano, A. Seawright and J. Buck give a well illustrated account of the modelling and synthesis techniques of RTL (register-transfer level). Particularly interesting is the discussion of State Charts, Esterel and Grammar-Based modelling. G. deMicheli's treatment of Cell-based logic optimisation is well illustrated with 22 central examples, 18 of which deal with Boolean and generalised matching. The formal nature R. Otten's treatment of gate sizing might be somewhat daunting to the uninitiated. H-J. Wunderlich gives a good readable account of fault-modelling followed by a comprehensive treatment of BIST. H. Eveking provides a clear exposition of tools to support formal results on hardware verification. L. Lavagno, A. Sangiovanni-Vincentelli and E. Sentovitch provide a particularly lucid account of common models of computation (MOC). The concept of Co-Design Finite State Machine (CSFM) as an extended finite state machine (FSM) with support for data handling and asynchronous communication is well explained. E. Borger and W. Schulte give a clear high level account of modular design of the Java Virtual Machine architecture. The treatment is rigorous and yet eminently readable. The merits and problems of bytecode machines are stated clearly. The explanation of four level hierarchical structure of the JVM architecture (basic stack, object-based, object-oriented and exception handling machines) is particularly good. Also fascinating is the four functional levels of *trustful*, *defensive*, *diligent* and *dynamic* machines. It is somewhat surprising to note that what is known as *attributes* in Object-oriented programming circles is referred to as *fields* by the authors.

The book should form an excellent basis for pursuing any of the above topics fully. The price tag of £38.50 might be considered somewhat prohibitive, especially when not all the book is lekely to be of interest to any individual reader.