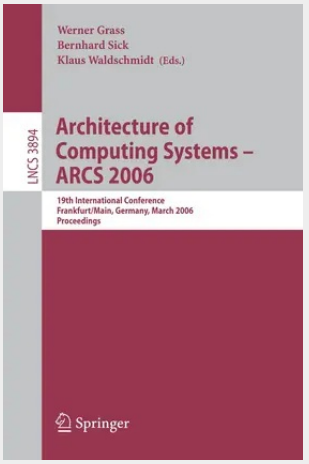
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Architecture of Computing Systems - ARCS 2006

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Technological progress is one of the driving forces behind the dramatic devel- mentofcomputersystemarchitecturesoverthe pastthreedecades.Eventhough it is quite clear that this development cannot only be measured by the ma- mum number of components on a chip, Moore's Law may be and is often taken as a simple measure for the non-braked growth of computational power over the years. The more components are realizable on a chip, the more innovative and unconventional ideas can be realized by system architects. As a result, research in computer system architectures is more exciting than ever before. This book coversthe trends that shape the ?eld of computer system archit- tures.Thefundamenataltrade-o?inthedesignofcomputing systemsis between ?exibility, performance,powerconsumption, andchip area.The full exploitation of future silicon capacity requires new architecture approaches and new design paradigms such as multiple computers on a single chip, recon?gurable processor arrays, extensible processor architectures, and embedded memory technologies. For a successful use in practical applications, it is not enough to solve the ha- wareproblemsbutalsotodevelopplatformsthatprovidesoftwareinfrastructure and support e? ective programming. A quantum jump in complexity is achieved by embedded computing systems with an unprecedented level of connectivity linking together a growing n- ber of physical devices through networks. Embedded systems will become more and more pervasive as the component technologies become smaller, faster, and cheaper. Their complexity arises not only from the large number of components but also from a lack of determinism and a continual evolution of these systems.

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