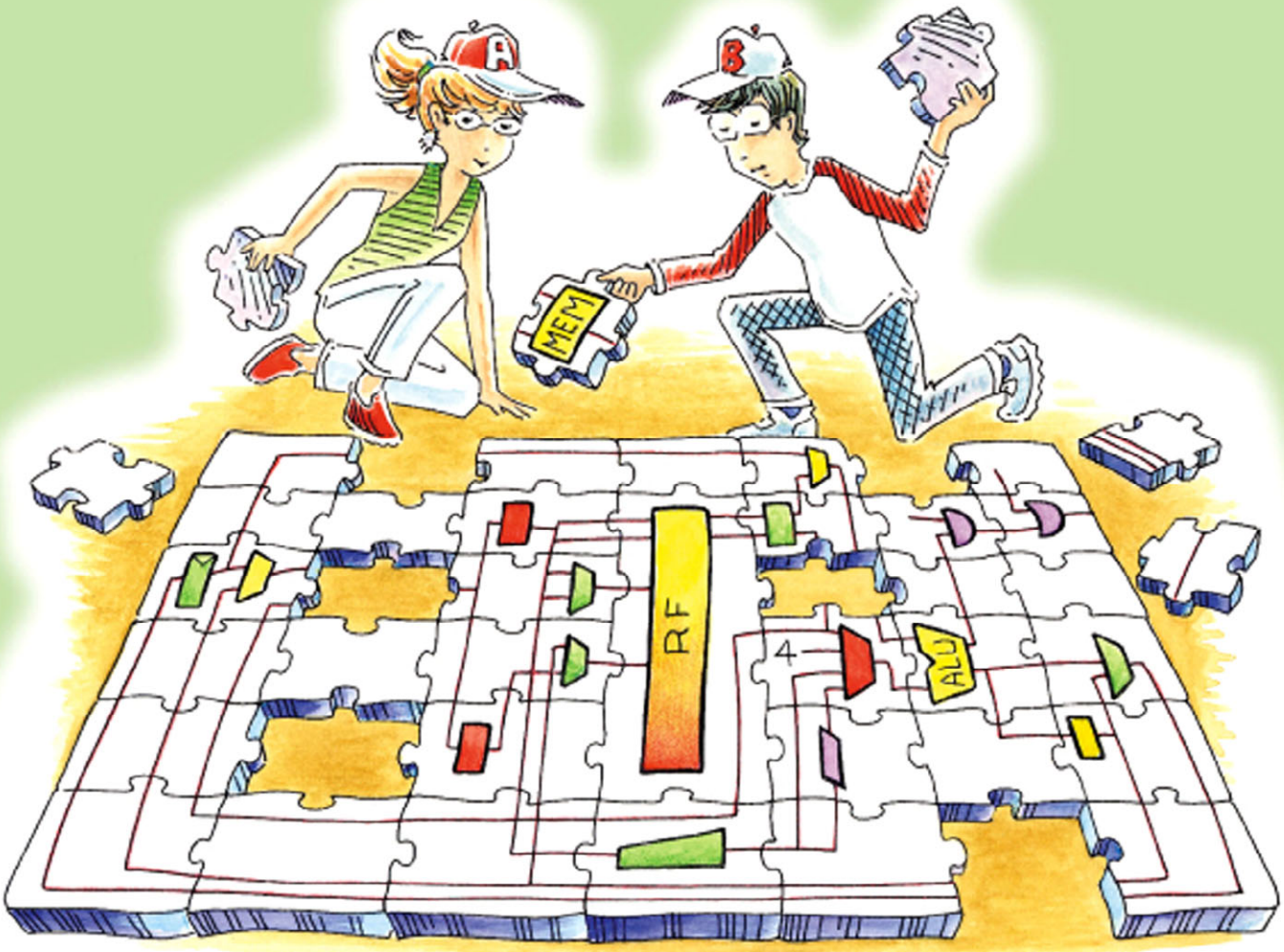
Digital Design and Computer Architecture

SECOND EDITION



David Money Harris & Sarah L. Harris

MK
MORGAN KAUFMANN

In Praise of *Digital Design and Computer Architecture*

Harris and Harris have taken the popular pedagogy from Computer Organization and Design *to the next level of refinement, showing in detail how to build a MIPS microprocessor in both SystemVerilog and VHDL. With the exciting opportunity that students have to run large digital designs on modern FGPAs, the approach the authors take in this book is both informative and enlightening.*

David A. Patterson University of California, Berkeley

Digital Design and Computer Architecture *brings a fresh perspective to an old discipline. Many textbooks tend to resemble overgrown shrubs, but Harris and Harris have managed to prune away the deadwood while preserving the fundamentals and presenting them in a contemporary context. In doing so, they offer a text that will benefit students interested in designing solutions for tomorrow's challenges.*

Jim Frenzel University of Idaho

Harris and Harris have a pleasant and informative writing style. Their treatment of the material is at a good level for introducing students to computer engineering with plenty of helpful diagrams. Combinational circuits, microarchitecture, and memory systems are handled particularly well.

James Pinter-Lucke Claremont McKenna College

Harris and Harris have written a book that is very clear and easy to understand. The exercises are well-designed and the real-world examples are a nice touch. The lengthy and confusing explanations often found in similar textbooks are not seen here. It's obvious that the authors have devoted a great deal of time and effort to create an accessible text. I strongly recommend Digital Design and Computer Architecture.

Peiyi Zhao Chapman University

Harris and Harris have created the first book that successfully combines digital system design with computer architecture. Digital Design and Computer Architecture *is a much-welcomed text that extensively explores digital systems designs and explains the MIPS architecture in fantastic detail. I highly recommend this book.*

James E. Stine, Jr., Oklahoma State University

Digital Design and Computer Architecture *is a brilliant book. Harris and Harris seamlessly tie together all the important elements in microprocessor design—transistors, circuits, logic gates, finite state machines, memories, arithmetic units—and conclude with computer architecture. This text is an excellent guide for understanding how complex systems can be flawlessly designed.*

Jaeha Kim Rambus, Inc.

Digital Design and Computer Architecture *is a very well-written book that will appeal to both young engineers who are learning these subjects for the first time and also to the experienced engineers who want to use this book as a reference. I highly recommend it.*

A. Utku Diril Nvidia Corporation

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About the Authors

David Money Harris is a professor of engineering at Harvey Mudd College. He received his Ph.D. in electrical engineering from Stanford University and his M.Eng. in electrical engineering and computer science from MIT. Before attending Stanford, he worked at Intel as a logic and circuit designer on the Itanium and Pentium II processors. Since then, he has consulted at Sun Microsystems, Hewlett-Packard, Evans & Sutherland, and other design companies.

David's passions include teaching, building chips, and exploring the outdoors. When he is not at work, he can usually be found hiking, mountaineering, or rock climbing. He particularly enjoys hiking with his three sons. David holds about a dozen patents and is the author of three other textbooks on chip design, as well as four guidebooks to the Southern California mountains.

Sarah L. Harris is an associate professor of engineering at Harvey Mudd College. She received her Ph.D. and M.S. in electrical engineering from Stanford University. Before attending Stanford, she received a B.S. in electrical and computer engineering from Brigham Young University. Sarah has also worked at Hewlett-Packard, the San Diego Supercomputer Center, and Nvidia.

Sarah loves teaching and experimenting in the lab. When she is not working or running after her two sons, you can find her playing music with friends, hiking, kayaking, biking, and traveling.

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David Money Harris
Sarah L. Harris

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To my family, Jennifer, Abraham, Samuel, and Benjamin
– DMH

To Ivan and Ocaan, who defy logic
– SLH

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