Further Reading

Chapter 1

Bell, C. G. [1996]. *Computer Pioneers and Pioneer Computers,* ACM and the Computer Museum, videotapes.

Two videotapes on the history of computing, produced by Gordon and Gwen Bell, including the following machines and their inventors: Harvard Mark-I, ENIAC, EDSAC, IAS machine, and many others.

Burks, A. W., H. H. Goldstine, and J. von Neumann [1946]. "Preliminary discussion of the logical design of an electronic computing instrument," Report to the U.S. Army Ordnance Department, p. 1; also appears in *Papers of John von Neumann,* W. Aspray and A. Burks, eds., MIT Press, Cambridge, MA., and Tomash Publishers, Los Angeles, 1987, 97–146.

A classic paper explaining computer hardware and software before the first stored-program computer was built. We quote extensively from it in Chapter 3. It simultaneously explained computers to the world and was a source of controversy because the first draft did not give credit to Eckert and Mauchly.

Campbell-Kelly, M., and W. Aspray [1996]. *Computer: A History of the Information Machine*, Basic Books, New York.

Two historians chronicle the dramatic story. The New York Times *calls it well written and authoritative.*

Ceruzzi, P. F. [1998] A History of Modern Computing. MIT Press, Cambridge, MA.

Contains a good description of the later history of computing: the integrated circuit and its impact, personal computers, UNIX, and the Internet.

Goldstine, H. H. [1972]. *The Computer: From Pascal to von Neumann,* Princeton University Press, Princeton, NJ.

A personal view of computing by one of the pioneers who worked with von Neumann.

Hennessy, J. L., and D. A. Patterson [2003]. Sections 1.3 and 1.4 of *Computer Architecture: A Quantitative Approach*, third edition, Morgan Kaufmann Publishers, San Francisco.

These sections contain much more detail on the cost of integrated circuits and explain the reasons for the difference between price and cost.

B.W. Lampson. *Personal distributed computing; The Alto and Ethernet software.* In ACM Conference on the History of Personal Workstations, January 1986.

C. R Thacker. *Personal distributed computing; The Alto and Ethernet hardware.* In ACM Conference on the History of Personal Workstations, January 1986.

These two papers describe the software and hardware of the landmark Alto.

Metropolis, N., Howlett, J, and G-C Rota, eds. [1980] *A History of Computing in the Twentieth Century*, Academic Press, New York.

A collection of essays that describe the people, software, computers, and laboratories involved in the first experimental and commercial computers. Most of the authors were personally involved in the projects. An excellent bibliography of early reports concludes this interesting book.

Public Broadcasting System [1992]. *The Machine that Changed the World,* videotapes.

These five one-hour programs include rare footage and interviews with pioneers of the computer industry.

Slater, R. [1987]. *Portraits in Silicon,* MIT Press, Cambridge, MA.

Short biographies of 31 computer pioneers.

Stern, N. [1980]. "Who invented the first electronic digital computer?" *Annals of the History of Computing* 2:4 (October) 375–76.

A historian's perspective on Atanasoff vs. Eckert and Mauchly.

Wilkes, M. V. [1985]. *Memoirs of a Computer Pioneer,* MIT Press, Cambridge, MA.

A personal view of computing by one of the pioneers.

Chapter 2

Bayko, J. [1996]. "Great Microprocessors of the Past and Present," available at *www.mkp.com/books_catalog/cod/links.htm.*

A personal view of the history of representative or unusual microprocessors, from the Intel 4004 to the Patriot Scientific ShBoom!

Kane, G., and J. Heinrich [1992]. *MIPS RISC Architecture,* Prentice Hall, Englewood Cliffs, NJ.

This book describes the MIPS architecture in greater detail than Appendix A.

Levy, H., and R. Eckhouse [1989]. *Computer Programming and Architecture: The VAX,* Digital Press, Boston.

This book concentrates on the VAX, but also includes descriptions of the Intel 80x86, IBM 360, and CDC 6600.

Morse, S., B. Ravenal, S. Mazor, and W. Pohlman [1980]. "Intel Microprocessors—8080 to 8086," *Computer* 13:10 (October).

The architecture history of the Intel from the 4004 to the 8086, according to the people who participated in the designs.

Wakerly, J. [1989]. *Microcomputer Architecture and Programming,* Wiley, New York.

The Motorola 680x0 is the main focus of the book, but it covers the Intel 8086, Motorola 6809, TI 9900, and Zilog Z8000.

Chapter 3

Burks, A. W., H. H. Goldstine, and J. von Neumann [1946]. "Preliminary discussion of the logical design of an electronic computing instrument," *Report to the U.S. Army Ordnance Dept.,* p. 1; also in *Papers of John von Neumann,* W. Aspray and A. Burks, eds., MIT Press, Cambridge, MA, and Tomash Publishers, Los Angeles, 97–146, 1987.

This classic paper includes arguments against floating-point hardware.

Goldberg, D. [1991]. "What every computer scientist should know about floating-point arithmetic," *ACM Computing Surveys* 23(1), 5–48.

Another good introduction to floating-point arithmetic by the same author, this time with emphasis on software.

Goldberg, D. [2002]. "Computer arithmetic," Appendix A of *Computer Architecture: A Quantitative Approach,* third edition, J. L. Hennessy and D. A. Patterson, Morgan Kaufmann Publishers, San Francisco. (This appendix is online.)

A more advanced introduction to integer and floating-point arithmetic, with emphasis on hardware. It covers Sections 3.4–3.6 of this book in just 10 pages, leaving another 45 pages for advanced topics.

Kahan, W. [1972]. "A survey of error-analysis," in *Info. Processing 71* (Proc. IFIP Congress 71 in Ljubljana), vol. 2, pp. 1214–39, North-Holland Publishing, Amsterdam.

This survey is a source of stories on the importance of accurate arithmetic.

Kahan, W. [1983]. "Mathematics written in sand," *Proc. Amer. Stat. Assoc. Joint Summer Meetings of 1983, Statistical Computing Section,* pp. 12–26.

The title refers to silicon and is another source of stories illustrating the importance of accurate arithmetic.

Kahan, W. [1990]. "On the advantage of the 8087's stack," unpublished course notes, Computer Science Division, University of California at Berkeley.

What the 8087 floating-point architecture could have been.

Kahan, W. [1997]. Available via a link to Kahan's homepage at *www.mkp.com/books_catalog/ cod/links.htm.*

A collection of memos related to floating point, including "Beastly numbers" (another less famous Pentium bug), "Notes on the IEEE floating point arithmetic" (including comments on how some features are atrophying), and "The baleful effects of computing benchmarks" (on the unhealthy preoccupation on speed versus correctness, accuracy, ease of use, flexibility, . . .).

Koren, I. [2002]. *Computer Arithmetic Algorithms*, second edition, A. K. Peters, Natick, MA.

A textbook aimed at seniors and first-year graduate students that explains fundamental principles of basic arithmetic, as well as complex operations such as logarithmic and trigonometric functions.

Wilkes, M. V. [1985]. *Memoirs of a Computer Pioneer*, MIT Press, Cambridge, MA.

This computer pioneer's recollections include the derivation of the standard hardware for multiply and divide developed by von Neumann.

Chapter 4

Curnow, H. J., and B. A. Wichmann [1976]. "A synthetic benchmark," *The Computer J.* 19 (1):80.

Describes the first major synthetic benchmark, Whetstone, and how it was created.

Flemming, P. J., and J. J. Wallace [1986]. "How not to lie with statistics: The correct way to summarize benchmark results," *Comm. ACM* 29:3 (March) 218–21.

Describes some of the underlying principles in using different means to summarize performance results.

McMahon, F. M. [1986]. "The Livermore FORTRAN kernels: A computer test of numerical performance range," Tech. Rep. UCRL-55745, Lawrence Livermore National Laboratory, Univ. of California, Livermore (December).

Describes the Livermore Loops—a set of Fortran kernel benchmarks.

Smith, J. E. [1988]. "Characterizing computer performance with a single number," *Comm. ACM* 31:10 (October) 1202–06.

Describes the difficulties of summarizing performance with just one number and argues for total execution time as the only consistent measure.

SPEC [2000]. *SPEC Benchmark Suite Release 1.0,* SPEC, Santa Clara, CA, October 2.

Describes the SPEC benchmark suite. For up-to-date information, see the SPEC Web page via a link at www.mkp.com/books_catalog/cod/links.htm.

Weicker, R. P. [1984]. "Dhrystone: A synthetic systems programming benchmark," *Comm. ACM* 27:10 (October) 1013–30.

Describes the Dhrystone benchmark and its construction.

Chapter 5

A basic Verilog tutorial is included on the CD. There are also many books both on Verilog and on digital design using Verilog.

Kidder, T. [1981]. *Soul of a New Machine*, Little, Brown, and Co., New York.

Describes the design of the Data General Eclipse series that replaced the first DG machines such as the Nova. Kidder records the intimate interactions among architects, hardware designers, microcoders, and project management.

Levy, H. M., and R. H. Eckhouse, Jr. [1989]. *Computer Programming and Architecture: The VAX*, Second ed., Digital Press, Bedford, MA.

Good description of the VAX architecture and several different microprogrammed implementations.

Patterson, D. A. [1983]. "Microprogramming," *Scientific American* 248:3 (March) 36–43.

Overview of microprogramming concepts.

Tucker, S. G. [1967]. "Microprogram control for the System/360," *IBM Systems J.* 6:4, 222–41.

Describes the microprogrammed control for the 360, the first microprogrammed commercial machine.

Wilkes, M. V. [1985]. *Memoirs of a Computer Pioneer*, MIT Press, Cambridge, MA.

Intriguing biography with many stories about industry pioneers and the trials and successes in building early machines.

Wilkes, M. V., and J. B. Stringer [1953]. "Microprogramming and the design of the control circuits in an electronic digital computer," *Proc. Cambridge Philosophical Society* 49:230–38. Also reprinted in D. P. Siewiorek, C. G. Bell, and A. Newell, *Computer Structures: Principles and Examples,* McGraw-Hill, New York, 158–63, 1982, and in "The Genesis of Microprogramming," in *Annals of the History of Computing* 8:116.

These two classic papers describe Wilkes's proposal for microcode.

Chapter 6

Bhandarkar, D., and D. W. Clark [1991]. "Performance from architecture: Comparing a RISC and a CISC with similar hardware organizations," *Proc. Fourth Conf. on Architectural Support for Programming Languages and Operating Systems,* IEEE/ACM (April), Palo Alto, CA, 310–19.

A quantitative comparison of RISC and CISC written by scholars who argued for CISCs as well as built them; they conclude that MIPS is between 2 and 4 times faster than a VAX built with similar technology, with a mean of 2.7.

Fisher, J. A., and B. R. Rau [1993]. *Journal of Supercomputing (*January*),* Kluwer.

This entire issue is devoted to the topic of exploiting ILP. It contains papers on both the architecture and software and is a wonderful source for further references.

Hennessy, J. L., and D. A. Patterson [2001]. *Computer Architecture: A Quantitative Approach*, third ed., San Francisco: Morgan Kaufmann.

Chapters 3 and 4 go into considerably more detail about pipelined processors (over 200 pages), including superscalar processors and VLIW processors.

Jouppi, N. P., and D. W. Wall [1989]. "Available instruction-level parallelism for superscalar and superpipelined processors," *Proc. Third Conf. on Architectural Support for Programming Languages and Operating Systems,* IEEE/ACM (April), Boston, 272–82.

A comparison of deeply pipelined (also called superpipelined) and superscalar systems.

Kogge, P. M. [1981]. *The Architecture of Pipelined Computers,* New York: McGraw-Hill.

A formal text on pipelined control, with emphasis on underlying principles.

Russell, R. M. [1978]. "The CRAY-1 computer system," *Comm. of the ACM* 21:1 (January) 63–72.

A short summary of a classic computer, which uses vectors of operations to remove pipeline stalls.

Smith, A., and J. Lee [1984]. "Branch prediction strategies and branch target buffer design," *Computer* 17:1 (January) 6–22.

An early survey on branch prediction.

Smith, J. E., and A. R. Plezkun [1988]. "Implementing precise interrupts in pipelined processors," *IEEE Trans. on Computers* 37:5 (May) 562–73.

Covers the difficulties in interrupting pipelined computers.

Thornton, J. E. [1970]. *Design of a Computer: The Control Data 6600,* Glenview, IL: Scott, Foresman.

A classic book describing a classic computer, considered the first supercomputer.

Chapter 7

Conti, C., D. H. Gibson, and S. H. Pitowsky [1968]. "Structural aspects of the System/360 Model 85, part I: General organization," *IBM Systems J.* 7:1, 2–14.

A classic paper that describes the first commercial computer to use a cache and its resulting performance.

Jason F. Cantin and Mark D. Hill [2001]. "Cache performance for selected SPEC CPU2000 benchmarks," SIGARCH Computer Architecture News, 29:4 (September), 13 - 18.

A reference paper of cache miss rates for many cache sizes for the SPEC2000 benchmarks.

Hennessy, J., and D. Patterson [2003]. Chapter 5 in *Computer Architecture: A Quantitative Approach*, Third edition, Morgan Kaufmann Publishers, San Francisco.

For more in-depth coverage of a variety of topics including protection, cache performance of out-of-order processors, virtually addressed caches, multilevel caches, compiler optimizations, additional latency tolerance mechanisms, and cache coherency.

Kilburn, T., D. B. G. Edwards, M. J. Lanigan, and F. H. Sumner [1962]. "One-level storage system," *IRE Transactions on Electronic Computers* EC-11 (April) 223–35. Also appears in D. P. Siewiorek, C. G. Bell, and A. Newell, *Computer Structures: Principles and Examples*, McGraw-Hill, New York, 135–48, 1982.

This classic paper is the first proposal for virtual memory.

LaMarca, A. and R. E. Ladner [1996. "The influence of caches on the performance of heaps," ACM J. of Experimental Algorithmics, vol.1, www.jea.acm.org/1996/LaMarcaInfluence/.

This paper shows the difference between complexity analysis of an algorithm, instruction count performance, and memory hierarchy for four sorting algorithms.

Przybylski, S. A. [1990]. *Cache and Memory Hierarchy Design: A Performance-Directed Approach*, Morgan Kaufmann Publishers, San Francisco.

A thorough exploration of multilevel memory hierarchies and their performance.

Ritchie, D.M. and K. Thompson. "UNIX Timesharing System: The UNIX Timesharing System." *Bell System Technical Journa*l, August 1978, pp. 1991-2019.

A paper describing the most elegant operating system ever invented.

Ritchie, Dennis. "The Evolution of the UNIX Timesharing System." *AT& T Bell Laboratories Technical Journal*, August 1984, pp. 1577-1593.

The history of UNIX from one of its inventors.

Silberschatz, A., P. Galvin, and G. Grange[2003]. *Operating System Concepts*, sixth edition, Addison-Wesley, Reading, MA.

An operating systems textbook with a thorough discussion of virtual memory, processes and process management, and protection issues.

Smith, A. J. [1982]. "Cache memories," *Computing Surveys* 14:3 (September) 473–530.

The classic survey paper on caches. This paper defined the terminology for the field and has served as a reference for many computer designers.

Smith, D.K. and R.C. Alexander. *Fumbling the Future: How Xerox Invented, Then Ignored, the First Personal Computer*. New York: Morrow, 1988.

A popular book that explains the role of Xerox PARC in laying the foundation for today's computing, which Xerox did not substantially benefit from.

Tanenbaum, A. [2001]. *Modern Operating Systems*, second edition, Prentice Hall, Upper Saddle River, NJ.

An operating system textbook with a good discussion of virtual memory.

Wilkes, M. [1965]. "Slave memories and dynamic storage allocation," *IEEE Trans. Electronic Computers* EC-14:2 (April) 270–71.

The first, classic paper on caches.

Chapter 8

Bashe, C. J., L. R. Johnson, J. H. Palmer, and E. W. Pugh [1986]. *IBM's Early Computers*, Cambridge, MA: MIT Press.

Describes the I/O system architecture and devices in IBM's early computers.

Brenner, P. [1997]. *A Technical Tutorial on the IEEE 802.11 Protoco*l found on many Web sites.

A widely referenced short tutorial that outlives the startup company for which the author worked.

Chen, P. M., E. K. Lee, G. A. Gibson, R. H. Katz, and D. A. Patterson [1994]. "RAID: High-performance, reliable secondary storage," *ACM Computing Surveys* 26:2 (June), 145–88.

A tutorial covering disk arrays and the advantages of such an organization.

Gray, J. [1990]. "A census of Tandem system availability between 1985 and 1990," *IEEE Transactions on Reliability* 39:4 (October), 409–18.

One of the first papers to categorize, quantify, and publish reasons for failures. It is still widely quoted.

Gray, J., and A. Reuter [1993]. *Transaction Processing: Concepts and Techniques*, San Francisco: Morgan Kaufmann.

A description of transaction processing, including discussions of benchmarking and performance evaluation.

Hennessy, J., and D. Patterson [2003]. *Computer Architecture: A Quantitative Approach*, third ed., San Francisco: Morgan Kaufmann Publishers, Chapters 7 and 8.

Chapter 7 focuses on storage, including an extensive discussion of RAID technologies and dependability. Chapter 8 focuses on networks.

Kahn, R. E. [1972]. "Resource-sharing computer communication networks," *Proc. IEEE* 60:11 (November), 1397–1407.

A classic paper that describes the ARPANET.

Laprie, J.-C. [1985]. "Dependable computing and fault tolerance: concepts and terminology," *15th Annual Int'l Symposium on Fault-Tolerant Computing FTCS 15,* Digest of Papers, Ann Arbor, MI (June 19–21), 2–11.

The paper that introduced standard definitions of dependability, reliability, and availability.

Levy, J. V. [1978]. "Buses: The skeleton of computer structures," in *Computer Engineering: A DEC View of Hardware Systems Design*, C. G. Bell, J. C. Mudge, and J. E. McNamara, eds., Bedford, MA: Digital Press.

This is a good overview of key concepts in bus design with some examples from DEC machines.

Lyman, P., and H. R. Varian [2003], "*How much information? 2003,*" *http://www.sims.berkeley.edu/research/projects/how-much-info-2003/.*

This project estimates the amount of information in the world from all possible sources.

Metcalfe, R. M., and D. R. Boggs [1976]. "Ethernet: Distributed packet switching for local computer networks," *Comm. ACM* 19:7 (July), 395–404.

A classic paper that describes the Ethernet network.

Myer, T. H., and I. E. Sutherland [1968]. "On the design of display processors," *Communications of the ACM* 11:6 (June), 410–14.

Another classic that notes how building powerful coprocessors can be a never-ending cycle.

Okada, S., Y. Matsuda, T. Yamada, and A. Kobayashi [1999]. "System on a chip for digital still camera," *IEEE Trans. on Consumer Electronics* 45:3 (August), 584–90.)

Oppenheimer, D., A. Ganapathi, and D. Patterson [2003]. "Why do Internet services fail, and what can be done about it?,"*4th Usenix Symposium on Internet Technologies and Systems*, March 26–28, Seattle, WA.

A recent update on Gray's classic paper, this time focused on Internet sites.

Patterson, D., G. Gibson, and R. Katz [1988]. "A case for redundant arrays of inexpensive disks (RAID)," *SIGMOD Conference.* 109–16.

A classic paper that advocates arrays of smaller disks and introduces RAID levels.

Saltzer, J. H., D. P. Reed, and D. D. Clark [1984]. "End-to-end arguments in system design," *ACM Trans. on Computer Systems* 2:4 (November), 277–88.

A classic paper that defines the end-to-end argument.

Smotherman, M. [1989]. "A sequencing-based taxonomy of I/O systems and review of historical machines," *Computer Architecture News* 17:5 (September), 5–15.

Describes the development of important ideas in I/O.

Talagala, N., R. Arpaci-Dusseau, and D. Patterson [2000]. "Micro-benchmark based extraction of local and global disk characteristics," *U.C. Berkeley Technical Report* CSD-99-1063, June 13.

Describes a simple program to automatically deduce key parameters of disks.

Chapter 9

Almasi, G. S., and A. Gottlieb [1989]. *Highly Parallel Computing,* Benjamin/Cummings, Redwood City, CA.

A textbook covering parallel computers.

Amdahl, G. M. [1967]. "Validity of the single processor approach to achieving large scale computing capabilities," *Proc. AFIPS Spring Joint Computer Conf.*, Atlantic City, NJ, (April) 483–85.

Written in response to the claims of the Illiac IV, this three-page article describes Amdahl's law and gives the classic reply to arguments for abandoning the current form of computing.

Andrews, G. R. [1991]. *Concurrent Programming: Principles and Practice,* Benjamin/Cummings, Redwood City, CA.

A text that gives the principles of parallel programming.

Archibald, J., and J.-L. Baer [1986]. "Cache coherence protocols: Evaluation using a multiprocessor simulation model," *ACM Trans. on Computer Systems* 4:4 (November), 273–98.

Classic survey paper of shared-bus cache coherence protocols.

Arpaci-Dusseau, A., R. Arpaci-Dusseau, D. Culler, J. Hellerstein, and D. Patterson [1997]. "High-performance sorting on networks of workstations," *Proc. ACM SIGMOD/PODS Conference on Management of Data*, Tucson, AZ, May 12–15.

How a world record sort was performed on a cluster, including architecture critique of the workstation and network interface. By April 1, 1997, they pushed the record to 8.6 GB in 1 minute and 2.2 seconds to sort 100 MB.

Bell, C. G. [1985]. "Multis: A new class of multiprocessor computers," *Science* 228 (April 26), 462–67.

Distinguishes shared address and nonshared address multiprocessors based on microprocessors.

Culler, D. E., and J. P. Singh, with A. Gupta [1998]. *Parallel Computer Architecture*, Morgan Kaufmann, San Francisco.

A textbook on parallel computers.

Falk, H. [1976]. "Reaching for the Gigaflop," *IEEE Spectrum* 13:10 (October), 65–70.

Chronicles the sad story of the Illiac IV: four times the cost and less than one-tenth the performance of original goals.

Flynn, M. J. [1966]. "Very high-speed computing systems," *Proc. IEEE* 54:12 (December), 1901–09.

Classic article showing SISD/SIMD/MISD/MIMD classifications.

Hennessy, J., and D. Patterson [2003]. Chapters 6 and 8 in *Computer Architecture: A Quantitative Approach*, third edition, Morgan Kaufmann Publishers, San Francisco.

A more in-depth coverage of a variety of multiprocessor and cluster topics, including programs and measurements.

Hord, R. M. [1982]. *The Illiac-IV, the First Supercomputer,* Computer Science Press, Rockville, MD.

A historical accounting of the Illiac IV project.

Hwang, K. [1993]. *Advanced Computer Architecture with Parallel Programming*, McGraw-Hill, New York.

Another textbook covering parallel computers.

Kozyrakis, C., and D. Patterson [2003]. "Scalable vector processors for embedded systems," *IEEE Micro* 23:6 (November–December), 36–45.

Examination of a vector architecture for the MIPS instruction set in media and signal processing.

Menabrea, L. F. [1842]. "Sketch of the analytical engine invented by Charles Babbage," *Bibliothèque Universelle de Genève* (October).

Certainly the earliest reference on multiprocessors, this mathematician made this comment while translating papers on Babbage's mechanical computer.

Pfister, G. F. [1998]. *In Search of Clusters: The Coming Battle in Lowly Parallel Computing*, second edition, Prentice-Hall, Upper Saddle River, NJ.

An entertaining book that advocates clusters and is critical of NUMA multiprocessors.

Seitz, C. [1985]. "The Cosmic Cube," *Comm. ACM* 28:1 (January), 22–31.

A tutorial article on a parallel processor connected via a hypertree. The Cosmic Cube is the ancestor of the Intel supercomputers.

Slotnick, D. L. [1982]. "The conception and development of parallel processors—A personal memoir," *Annals of the History of Computing* 4:1 (January), 20–30.

Recollections of the beginnings of parallel processing by the architect of the Illiac IV.

Appendix A

Sweetman, D. [1999]. *See MIPS Run*, Morgan Kaufmann Publishers, San Francisco, CA.

A complete, detailed, and engaging introduction to the MIPS instruction set and assembly language programming on these machines.

Detailed documentation on the MIPS32 architecture is available on the Web:

MIPS32™ Architecture for Programmers Volume I: Introduction to the MIPS32™ Architecture
(http://mips.com/content/Documentation/MIPSDocumentation/ProcessorArchitecture/ArchitectureProgrammingPublicationsforMIPS32/MD00082-2B-MIPS32INT-AFP-02.00.pdf/getDownload)

MIPS32™ Architecture for Programmers Volume II: The MIPS32™ Instruction Set
(http://mips.com/content/Documentation/MIPSDocumentation/ProcessorArchitecture/ArchitectureProgrammingPublicationsforMIPS32/MD00086-2B-MIPS32BIS-AFP-02.00.pdf/getDownload)

MIPS32™ Architecture for Programmers Volume III: The MIPS32™ Privileged Resource Architecture
(http://mips.com/content/Documentation/MIPSDocumentation/ProcessorArchitecture/ArchitectureProgrammingPublicationsforMIPS32/MD00090-2B-MIPS32PRA-AFP-02.00.pdf/getDownload)

Aho, A., R. Sethi, and J. Ullman [1985]. *Compilers: Principles, Techniques, and Tools*, Addison-Wesley, Reading, MA.

Slightly dated and lacking in coverage of modern architectures, but still the standard reference on compilers.

Appendix B

Ciletti, M. D. [2002] *Advanced Digital Design with the Verilog HDL,* Englewood Cliffs, NJ: Prentice-Hall.

A thorough book on logic design using Verilog.

Katz, R. H. [2004]. *Modern Logic Design,* second edition, Reading, MA: Addison Wesley.

A general text on logic design.

Wakerly, J. F. [2000]. *Digital Design: Principles and Practices,* third ed., Englewood Cliffs, NJ: Prentice-Hall.
A general text on logic design.