

CSC460 References (Spring 2005)

Apr. 20, 2005

The books available in the TCNJ library are indicated with “L”.

Standard texts in the Theory of Computation

- Greenlaw, Raymond and Hoover, H. James. 1998. *Fundamentals of the Theory of Computation*. Morgan Kaufmann. [another gentler introduction; little computability theory]
- Hein, James L. 1996. *Theory of Computation: An Introduction*. Jones and Bartlett.
- Hopcroft, John E., Motwani, Rajeev, and Ullman, Jeffrey D. 2001. *Introduction to Automata Theory, Languages, and Computation*, 2nd ed. Addison-Wesley. [the textbook; L (3-hour reserve)]
- Hopcroft, John E. and Ullman, Jeffrey D. 1979 *Introduction to automata theory, languages, and computation*. Addison-Wesley. [the first edition of our text; contains some more advanced materials; the discussion of the Chomsky hierarchy (Unit C1) is mainly based on this book; L (3-hour reserve)]
- Lewis, Harry R. and Papadimitriou, Christos H. 1981. *Elements of the Theory of Computation*. Prentice-Hall. [another classic; L]
- Linz, Peter. 2001. *An Introduction to Formal Languages and Automata*, 3rd ed. Jones & Bartlett. [very good, but little coverage of complexity theory; the discussion of the pumping lemma (Unit C3/C4) is mainly based on this book]
- Martin, John C. 1997. *Introduction to Languages and the Theory of Computation*, 2nd ed. WCB McGraw-Hill. [another undergrad text; L]
- Sipser, Michael. 1997. *Introduction to the theory of computation*. PWS. [used as a textbook in the past; space complexity ideas (Unit D3) are mainly taken from this book; L (3-hour reserve)]
- Sudkamp, Thomas A. 1997. *Languages and Machines*, 2nd ed. Addison Wesley.

Other Theory of Computation references

- Atallah, Mikhail J, ed. 1999. *Algorithms and Theory of Computation Handbook*. CRC Press. [L]
- Baase, Sarah. 2000. *Computer Algorithms, Introduction to Design and Analysis*. Addison-Wesley. [classic text in algorithms; parallel algorithm examples (Unit D4) are mainly from this book]
- Blum, Lenore, et al. 1998. *Complexity and Real Computation*. Springer. [L]
- Cai, Jin-Yi. 2003. Lectures in Computational Complexity. [available on-line: <http://www.cs.wisc.edu/~jyc/810notes/book-ch1to5.pdf>]
- Chaitin, Gregory J. 1999. *The Unknowable*. Springer. [L]
- Cutland, N. J. 1980. *Computability: An Introduction to Recursive Function Theory*. Cambridge Univ. Press. [good intro to recursive function theory; recursive functions and URM ideas (Unit B5/B7) are mainly from this book]
- Davis, Martin. 1982. *Computability and Unsolvability*. Dover. [examples of unsolvable problems]
- Denning, Peter J., et al. 1978. *Machines, Languages, and Computation*. Prentice-Hall. [L]
- Dewdney, A. K. 1989. *The Turing Omnibus: 61 Excursions in Computer Science*. Computer Science Press. [a very readable introduction to various CS topics; the halting problem reading (Ex B1) and some Sample Problems are taken from this book; L]
- Epstein, Richard L. and Carnielli, Walter A. 1989. *Computability: Computable Functions, Logic, and the Foundations of Mathematics*. Wardsworth & Brooks/Cole. [interesting collection of topics with a lot of excerpts]
- Garey, Michael R. and Johnson, David S. 1979. *Computers and Intractability: A Guide to the Theory of NP-Completeness*. W. H. Freeman. [extensive collection of NP-complete problems; NPC problems and their connections (Unit D1/D2) are mainly taken from this book; L]
- Griffor, Er. R., ed. 1999. *Handbook of Computability Theory*. Elsevier. [L]
- Harel, David and Rosner, Roni . 1992. *Algorithmics: The Spirit of Computing*, 2nd ed. Addison-Wesley. [a readable introduction to algorithms and computing; broader scope]
- Révész, György E. 1991. *Introduction to Formal Languages*. Dover. [L]
- Rogers, Hartley , Jr. 1987. *Theory of Recursive Functions and Effective Computability*. MIT Press. [classic; L]
- Salomaa, Arto. 1985. *Computation and Automata*. Cambridge Univ. Press. [L]
- Traub, J. F. and Werschulz, A. G. 1998. *Complexity and Information*. Cambridge Univ. Press. [L]

Logic and applied logic

- Ebbinghaus, Heinz-Dieter, Flum, Jörg, and Thomas, Wolfgang. 1984. *Mathematical logic*. Springer-Verlag.
- Enderton, Herbert B. 2001. *A mathematical introduction to logic*, 2nd ed. Harcourt. [classic introduction; **L** (only the 1st edition, 1972)]
- Hintikka, Jaakko. 1996. *The principles of mathematics revisited*. Cambridge: Cambridge University Press. [a fresh, very critical role of FOL; discusses an alternative (still first-order) logic based on game-theoretic interpretation]
- Huth, Michael R. A. and Ryan, Mark D. 2000. *Logic in Computer Science: Modeling and Reasoning about Systems*. Cambridge Univ. Press. [intro to (semantic) model checking and (syntactic) program verification; **L**]
- Loeckx, Jacques, Ehrich, Hans-Dieter, and Wolf, Markus. 1996. *Specification of abstract data types*. Wiley. [emphasis on the logic-structure connection applied to software specification, lightly touched on in connection to the discussion of theories (Unit A2)]

Beyond Turing computability

- Copeland, B. Jack. 2003. Hypercomputation. *Minds and Machines* 12(4):461-502. [very broad survey; an intro to the series of articles on hypercomputation]
- Copeland, B. Jack. 2000. Narrow Versus Wide Mechanisms: Including a Re-examination of Turing's Views on the Mind-Machine Use. *Journal of Philosophy* 97(1):5-32. [**L**]
- Copeland, B. Jack. 2000. Alan Turing's Forgotten Ideas in Computer Science. *Scientific American* 280(4):77-81. [**L**]
- Goldin, Dina. 2000. Persistent Turing Machines as a Model of Interactive Computation. In *Foundations of information and knowledge systems: First International Symposium, FoIKS 2000, Burg, Germany, February, 2000 (Lecture notes in computer science, 1762)*, eds. Klaus-Dieter Schewe and B. Thalheim, 116-135. Springer. [the idea of Interaction Machines (Unit D6) is taken from this article]
- Goldin, Dina and Keil, David. 2001. Interaction, Evolution, and Intelligence. In *Proceedings of the Congress on Evolutionary Computation*, Korea, May 2001.
- Israel, Navot and Goldenfeld, Nigel. 2004. Computational Irreducibility and the Predictability of Complex Physical Systems. *Physical Review Letters* 92(7):074105. [analysis of Wolfram's ideas]
- MacLennan, B. J. 2003. Transcending Turing Computability. *Minds and Machines* 13(1):3-22. [used for Ex D4]
- Milner, Robin. 1993. Elements of Interaction (Turing Award Lecture). *Communications of the ACM* 36(1):78-89. [the idea of π -calculus (Unit D6) is taken from this article; **L**]
- Shagrir, Oron and Pitowsky, Itamar. 2003. Physical Hypercomputation and the Church-Turing Thesis. *Minds and Machines* 13(1):87-101.
- Siegelmann, Hava T. 2003. Neural and Super-Turing Computing. *Minds and Machines* 13(1):103-114.
- Siegelmann, HT. 1995. Computation Beyond the Turing Limit. *Science* 268:545-548. [**L**]
- Stannet, Mike. 2003. Computation and Hypercomputation. *Minds and Machines* 13(1):115-153.
- Steinhart, Eric. 2003. Supermachines and Superminds. *Minds and Machines* 13(1):155-186.
- Thomas, Wolfgang. 1990. Automata on Infinite Objects. In *Handbook of theoretical computer science*, ed. J. van Leeuwen, 133-191. Elsevier.
- van Leeuwen, Jan and Wiedermann, Jiri. 2001. The Turing machine paradigm in contemporary computing. In *Mathematics Unlimited - 2001 and Beyond*, eds. B. Enquist and W. Schmid, 1139-1155. Springer. [a draft version of (i.e., not necessarily identical to) the listed paper available at van Leeuwen's web site: <http://www.cs.uu.nl/people/jan/>; used for Ex D5]
- von Neumann, John. 1967. The General and Logical Theory of Automata. In *Cerebral Mechanisms in Behavior*, ed. Lloyd A. Jeffress, 1-31. Hafner Publishing.
- Wegner, Peter. 1997. Why Interaction is More Powerful Than Algorithms. *Communications of the ACM* 40(5):80-91. [**L**]
- Wegner, Peter and Goldin, Dina. 2003. Computation Beyond Turing Machines: Seeking appropriate methods to model computing and human thought. *Communications of the ACM* 46(4):100-102. [**L**]

- Wolfram, Stephen. 2002. *A new kind of science*. Wolfram Media. [extensive work on cellular automata; L]

Not classified

- Booth, Wayne C., Colomb, Gregory G., and Williams, Joseph M. 2003. *The craft of research*, 2nd ed. University of Chicago press. [excellent book on writing a research paper; basis for the connection between practical and research problems as well as the reference to “cost”/“significance” along with a problem (Unit A1); L]
- Gottman, John M., Murray, James D., Swanson, Catherine C., Tyson, Rebecca, and Swanson, Kristin. 2002. *The mathematics of marriage: dynamic nonlinear models*. MIT Press. [L]
- Kline, A. David. 1998. Introduction (to Part 4 Theory and Observation). In *Introductory readings in the philosophy of science*, eds. E. D. Klemke, Robert Hollinger, and David Wëyss Rudge, 309-315. Prometheus Books. [some useful ideas about “theories”]
- Michalewicz, Zbigniew and Fogel David B. 2000. *How to Solve It: Modern Heuristics*. Springer-Verlag. [discusses a variety of probably intractable (and other problems) from a practical point of view; L]
- Simon, Herbert Alexander. 1996. *The sciences of the artificial*, 3rd ed. MIT Press. [L (1st ed.)]
- Stewart, David and Mickunas, Algis. 1990. *Exploring phenomenology: a guide to the field and its literature*, 2nd ed. Ohio University Press.
- Suppes, Patrick. 2002. *Representation and invariance of scientific structures*. CSLI Publications. [esp. on scientific theory and the logic-structure connection]

// End