

Carl Burch

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- Education** **Carnegie Mellon University**, Pittsburgh PA
May 00 *Doctor of Philosophy in Computer Science*, advisor: Avrim Blum,
thesis title: *Machine learning in metrical task systems and other on-line problems*
- May 98 **Carnegie Mellon University**, Pittsburgh PA
Master of Science in Computer Science
- May 95 **University of Oklahoma**, Norman OK
Bachelor of Science in Computer Science with special distinction, mathematics minor
- Teaching Experience** **Hendrix College**, Conway AR
Fall 04–present *Associate professor (Fall 08–present)*
Fall 00–Spring 04 **College of Saint Benedict and Saint John’s University**, Collegeville MN
Assistant professor
- Summers 97–02 **Pennsylvania Governor’s School for the Sciences**, Pittsburgh PA
Faculty member
- Spring 96, Fall 97 **Carnegie Mellon University**, Pittsburgh PA
Fall 98, Spring 99 *Teaching assistant*
- Research Experience** **Carnegie Mellon University**, Pittsburgh PA
Aug 95–May 00 *Graduate research fellow*
Researched problems in machine learning theory, on-line algorithms, and approximation algorithms
- May 97–Aug 97 **Sandia National Laboratories**, Albuquerque NM
May 98–Jun 98 *Graduate research intern*
Developed and tested approximation algorithms for network reliability evaluation
- Jun 95–Aug 95 **Conoco Inc**, Ponca City OK
Image analysis specialist
Developed solutions to image analysis problems
- Jun 93–Dec 93 **University of Oklahoma School of Computer Science**, Norman OK
Undergraduate research assistant
Simulated recovery techniques for main-memory databases
- Other Experience** **Highbridge Community Life Center**, Bronx NY
Aug 99–Jul 00 *Volunteer technology director* (associated with VISTA and Lasallian Volunteers)
Directed all computer technology of the community development agency in the south Bronx (100-node Windows network).

- Journal and Book Publications**
- C Burch, R Carr, S Krumke, M Marathe, C Phillips, E Sundberg. “A decomposition-based pseudoapproximation algorithm for network flow inhibition,” in *Network Interdiction and Stochastic Integer Programming*, D L Woodruff (ed), Kluwer Academic Press, 2002, pages 51–68.
- C Burch. “Logisim: A graphical system for logic circuit design and simulation.” *Journal on Educational Resources in Computing* 2:1, 2002, pages 5–16.
- A Blum, C Burch. “On-line learning and the metrical task system problem.” *Machine Learning* 39:1, 2000, pages 35–58.
- Conference Presentations**
- C Burch, L Ziegler. “Science of Computing Suite (SOCS): Resources for a breadth-first introduction.” *SIGCSE Technical Symposium on Computer Science Education*, 2004, pages 437–441.
- C Burch. “Introducing computer science in a summer program.” *National Educational Computing Conference*, 2001.
- A Blum, C Burch, A Kalai. “Finely-competitive paging.” *IEEE Foundations of Computer Science*, 1999, pages 450–457.
- A Blum, C Burch, J Langford. “On learning monotone Boolean functions.” *IEEE Foundations of Computer Science*, 1998, pages 408–415.
- A Blum, C Burch. “On-line learning and the metrical task system problem.” *ACM Conference on Computational Learning Theory*, 1997, pages 45–53.
- Y Bartal, A Blum, C Burch, A Tomkins. “A $\text{polylog}(n)$ -competitive algorithm for metrical task systems.” *ACM Symposium on Theory of Computing*, 1997, pages 711–719.
- Course Material**
- The Science of Computing*, textbook at www.cburch.com/socs/.
- Many pieces of simulation software, including Logisim (logic circuits), Jigsaw (beginners’ Java IDE), aas (ARM processor simulator), Automaton Simulator (automata, Turing machines), Lambda Calculator (lambda calculus), Grammar Editor (context-free grammars), SimHYMN (simple CPU), available at www.cburch.com/socs/.
- Grants**
- C Burch, *Summer Software Development Odyssey*, internal grant, Feb 2008. \$5,000 awarded.
- C Burch, G Ferrer, A Wright, *Laboratory for robotics and embedded systems*, Hewlett-Packard, Feb 2007. Denied.
- C Burch, R Hesse, J Holey, *Increasing retention in computer science and mathematics*, National Science Foundation, Feb 2003. Denied.
- L Ziegler, C Burch, *A Java programming workshop for computer science*, CSB/SJU Professional Development Fund, Feb 2000. \$8,000 awarded.

Courses Taught Hendrix	CSCI 115 Computing and the Internet, S07, F07
	CSCI 150 Foundations of computer science II, F06, S07, F07, F08
	CSCI 151 Foundations of computer science II, F04, S05, F05, S06, F07, F08
	CSCI 230 Computing systems organization, S06, S07, S08, F08
	CSCI 330 Computer architecture, F06
	CSCI 340 Database systems, S06, S08
	CSCI 360 Survey of programming languages, F04
	CSCI 490 Advanced topics: Computer graphics, S05
	MATH 240 Discrete mathematics, F05
	MATH/CSCI 497 Senior seminar, F06, S08
CSB/SJU	CSCI 150 Introduction to the science of computing, F00, S01, F02, F03
	CSCI 160 Problem solving, programming, and computers, F01, S02
	CSCI 210 Levels of architecture, languages, and applications, F02, S03, S04
	CSCI 276 Artificial intelligence, Jan 01
	CSCI 340 Organization of programming languages, S01, S03
	CSCI 341 Compiler theory, S01
	CSCI 350 Operating systems, F01
	CORE 100 First-year symposium, F03
Penn. Gov.'s School for the Sciences	CORE 101 First-year symposium, S04
	Computer science core course, 97, 98, 99, 00, 01, 02
	Computer science team projects, 00, 02
Carnegie Mellon (teaching assistant)	Machine learning elective, 01, 02
	15–211 Fundamental data structures and algorithms, S96, F97
	15–251 Great theoretical ideas in computer science, S99
	15–451 Algorithm design and analysis, F98

**Undergraduate
Research
Mentored**

J Franklin, senior thesis, *Wire Realignment in Toves*, 2008.
A Thomas, senior thesis, *Art and Computers*, 2008.
L Kaufman, senior thesis, *Robot Path Planning*, 2007.
J Keahey, senior thesis, *Robot Localization*, 2007. Student presented paper at Hendrix-Rhodes-Sewanee conference.
N Bledsoe, internship, *Function Approximation in Reinforcement Learning*, 2005. Student poster at Hendrix Honors Day.
T Durnan, senior thesis, *Learning-Based Artificial Intelligence Applied to a Strategic Bidding Card Game*, 2004.
N Dalbec, senior project, *Incorporating Clicking into a Visually Controlled Mouse*, 2004.
C Marsh, senior thesis, *Applying Reinforcement Learning to a Continuous Situation*, 2003. Student presented paper at NCUR 2003.
B Franek, senior thesis, *Computer Vision: Image Analysis and Recognition*, 2002.
R Schafer, senior thesis, *Protecting Brand Image: A Web Based Trademark Surveillance Application*, 2002.
N Charboneau, senior thesis, *Voice Interactive Events Calendar at the College of Saint Benedict/Saint John's University: A Feasibility Study Using VXML*, 2001. Student presented paper at NCUR 2001.

**Activities
and Awards
Hendrix**

Mathematics & Computer Science Department, chair, 08–09.
Computer Science Faculty Search, chair, 07–08.
Summer Software Development Odyssey, Summer 08.
Advanced Placement Computer Science grader, Summer 05, 06, 07.
Committee on Curriculum, member 05–09.
Service trip leader, Pascagoula hurricane relief F05, San Francisco Tenderloin S06
Faculty Salary Task Force, member 05–06.
Programming Team, coach F05, F06, S08, F08.

CSB/SJU

Computer Science Faculty-Student Book Discussions, leader S05, F05.
College Faculty Development and Research Committee, member 03–04.
College Committee on Academic Computing, member 02–03.
Programming Team, coach 02–04.
Computer Gaming Club, advisor 02–04.
Web page designer, Computer Science Department, 01–04.
Computer Science Club, advisor 01–02.

**Penn. Gov.'s School
for the Sciences
Carnegie Mellon**

Distinguished Service Award, July 00.
Invited Speaker, School of Computer Science Distinguished Lecture Series, Feb 01.
School of Computer Science Dissertation Award, 99-00, awarded to top two dissertations from CMU's computer science college.
National Science Foundation Graduate Fellowship, 96–99.

**Local
Presentations
Hendrix**

Faculty Colloquium, “Logisim and open-source software,” Spring 2008.
Tuesday Talks, Spring 2006.
Friday Discussions, Panel on mathematics and religion, Spring 2005.

**Conference
Service**

Consortium for Computing Sciences in Colleges Mid-South, student papers chair, Russellville, AR, Apr 08.
JETT (workshop for AP teachers), lead organizer, Hendrix College, Aug 05.
JETT (workshop for AP teachers), lead organizer, Hendrix College, Aug 04.

**Conferences
Attended**

Consortium for Computing Sciences in Colleges Mid-South, Russellville AR, Jan 08.
MAA-AMS Joint Mathematics Meeting, San Diego LA, Jan 08.
MAA-AMS Joint Mathematics Meeting, New Orleans LA, Jan 07.
SIGCSE Tech. Symposium on Computer Science Education, Houston TX, Mar 06.
SIGCSE Tech. Symposium on Computer Science Education, St Louis MO, Feb 05.
SIGCSE Tech. Symposium on Computer Science Education, Norfolk VA, Mar 04.
Collegium, Collegeville MN, Jun 03.
Midwest Instruction and Computing Symposium, Duluth MN, Apr 03.
Sharing Stories of Vocation, Pepperdine University CA, Oct 02.
National Educational Computing Conference, El Paso TX, Jun 02.
SIGCSE Tech. Symposium on Computer Science Education, Covington KY, Feb 02.
IEEE Symposium on Foundations of Computer Science, New York NY, Oct 99.
IEEE Symposium on Foundations of Computer Science, Palo Alto CA, Nov 98.
ACM Symposium on Theory of Computing, Dallas TX, May 98.
ACM Conference on Computational Learning Theory, Nashville TN, July 97.
SIGCSE Tech. Symposium on Computer Science Education, San Jose CA, Feb 97.