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
	Associate professor (Fall 08–present)
Fall 04–present	*Assistant professor (Fall 04–Spring 07 — tenured Spring 07)*
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 Fall 98, Spring 99	**Carnegie Mellon University**, Pittsburgh PA *Teaching assistant*
Research Experience	**Carnegie Mellon University**, Pittsburgh PA
	Graduate research fellow
Aug 95–May 00	Researched problems in machine learning theory, on-line algorithms, and approximation algorithms
May 97–Aug 97 May 98–Jun 98	**Sandia National Laboratories**, Albuquerque NM *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
	Volunteer technology director (associated with VISTA and Lasallian Volunteers)
Aug 99–Jul 00	Directed all computer technology of the community development agency in the south Bronx (100-node Windows network).

Course Material

Logisim, *www.cburch.com/logisim/*, 2001–11. A cross-platform graphical tool for drawing and simulating digital circuits. Includes 61,000 lines of open-source Java (GPL). Downloaded 200,000 times annually and used in classes at many colleges including Grinnell, Swarthmore, and Harvey Mudd.

Toves, *www.toves.org*, 2013. Intended as the successor to Logisim, eventually to incorporate the same functionality. Currently includes 8,000 lines of open-source C# using Mono (GPL).

Lambda Calculator, *www.cburch.com/lambda/*, 2012. A Web-based tool for computing lambda calculus reductions. Includes 1,600 lines of open-source JavaScript using jQuery (MPL).

aas, *www.toves.org/aas/*, 2008–13. An integrated assembler and simulator for the ARMv4 instruction set. Includes 3,000 lines of Java.

Computing Systems Organization, *www.toves.org/cso/*, 2009–13. A series of 16 documents teaching about concepts in computing systems (Creative Commons BY-SA).

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.

Refereed Conference Presentations

C Burch. "Jigsaw, a Programming Environment for Java in CS1." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, April 2009. Appeared in *Journal of Computing Sciences in Colleges*, May 2009, 24:5, pages 37–43.

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, L Ziegler. "Science of Computing Suite (SOCS): Resources for a breadth-first introduction." *SIGCSE Technical Symposium on Computer Science Education*, 2004, pages 437–441.

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 $polylog(n)$-competitive algorithm for metrical task systems." *ACM Symposium on Theory of Computing*, 1997, pages 711–719.

Other Conference Presentations

C Burch. "Browser-Based Graphics — Conference Tutorial." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, April 2013.

C Burch. "Protein Folding — Nifty Assignment." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, March 2012. Appeared in *Journal of Computing Sciences in Colleges*, May 2012, 27:5, pages 33–34.

C Burch (chair), D Naugler, D Sonnier. "Fitting Computer Science in a College — Panel Discussion." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, March 2012. Appeared in *Journal of Computing Sciences in Colleges*, May 2012, 27:5, pages 8–9.

C Burch. "Comparing JavaScript Frameworks — Conference Tutorial." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, March 2012. Appeared in *Journal of Computing Sciences in Colleges*, May 2012, 27:5, page 92.

C Burch. "Electric Bugle — A Nifty Assignment." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, April 2011. Appeared in *Journal of Computing Sciences in Colleges*, May 2011, 26:5, pages 38–39.

C Burch. "Logisim and circuit simulation: Future directions." Birds-of-a-feather discussion. *SIGCSE Technical Symposium on Computer Science Education*, March 2011, page 706.

M Brown, C Burch, C Hu, M Nooner. "CS0: Why, What and How? — Panel Discussion." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, March 2010. Appeared in *Journal of Computing Sciences in Colleges*, May 2010, 26:5, pages 79–81.

C Burch. "Django, A Web Framework Using Python — Tutorial." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, March 2010. Appeared in *Journal of Computing Sciences in Colleges*, May 2010, 25:5, pages 154–155.

C Burch. "Object-Oriented Space Physics — A Nifty Assignment." *Consortium for Computing Sciences in Colleges: Mid-South Conference*, March 2010. Appeared in *Journal of Computing Sciences in Colleges*, May 2011, 26:5, pages 150–151.

C Burch. "Introducing computer science in a summer program." *National Educational Computing Conference*, 2001.

Invited Presentations

PyArkansas Conference, "Designing a simple SQL processor for text files," Oct 11.

PyArkansas Conference, "Python for Programmers," Oct 10.

PyArkansas Conference, "Python for Programmers," Nov 09.

Faculty Colloquium, "Logisim and open-source software," Mar 08.

Penn. Governor's School for the Sciences 25th anniversary, "Simulating Circuits with Logisim," Jul 07.

Carnegie Mellon Computer Science, Distinguished Lecture Series, Feb 01.

Grants

C Burch, *Institutional Support for Summer Research Programs at Hendrix*, internal grant, Jan 2012. $6,000 awarded.

C Burch, *Open-Source Software Development Odyssey*, internal grant, Sep 2011. $4,540 awarded.

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.

Awards

Distinguished Service Award, Pennsylvania Governor's School for the Sciences, July 00.

School of Computer Science Dissertation Award, awarded to top two dissertations from CMU's computer science college, 99–00.

National Science Foundation Graduate Fellowship, 96–99.

Departmental Activities

Hendrix

Linux network administrator, 05–present.

Programming team coach, 05–present.

Computer Science faculty search committee, 07–08 (chair), 13–14.

Department chair (mathematics & computer science), 08–10.

Mathematics faculty search committee, 06–07, 09–10 (chair).

Computer Science Faculty-Student Book Discussions, leader S05, F05.

CSB/SJU

Programming Team, coach 02–04.

Computer Gaming Club, advisor 02–04.

Web page designer, 01–04.

Computer Science Club, advisor 01–02.

College Activities

Hendrix

Chair of natural sciences area, 11–present.

Service trip leader, Pascagoula hurricane relief F05; San Francisco Tenderloin S06; Navajo Reservation S09; New Orleans W11.

Committee on Curriculum, member 05–10.

Chemistry faculty search committee, 06–07.

Faculty Salary Task Force, member 05–06.

CSB/SJU

Faculty Development and Research Committee, member 03–04.

Committee on Academic Computing, member 02–03.

Professional Service	*CCSC:Mid-South*, nifty assignments chair, Mar 10–Apr 14; reviewer, Apr 09–Apr 14; student papers chair, Apr 08–Apr 09.
	Advanced Placement Computer Science grader, Summer 05, 06, 07, 10.
	Applied Research in Information Technology (by Acxiom), reviewer, Feb 09.
	JETT (workshop for AP teachers), lead organizer, Aug 04 & 05, Hendrix College.

Courses Taught	CSCI 150 Foundations of computer science, S14
Hendrix (last four years)	CSCI 230 Computing systems organization, F11, F12, F13
	CSCI 330 Computer architecture, S13
	CSCI 340 Database & Web systems, S12, S14
	CSCI 360 Survey of programming languages, F12
	CSCI 420 Operating systems & concurrent computing, F13
Hendrix (previously)	CSCI 115 Computing and the Internet, S07, F07
	CSCI 135/PHYS 135 Robotics exploration studio, F09
	CSCI 150 Foundations of computer science, F06, S07, F07, F08, S09, F09, S10
	CSCI 151 Data structures, F04, S05, F05, S06, F07, F08
	CSCI 230 Computing systems organization, S06, S07, S08, F08, S10
	CSCI 280 Algorithms and problem-solving paradigms, S09
	CSCI 330 Computer architecture, F06
	CSCI 340 Database systems, S06, S08, S10
	CSCI 360 Survey of programming languages, F04
	CSCI 490 Advanced topics: Computer graphics, S05
	LBST 101 Explorations, F09
	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
	CORE 101 First-year symposium, S04
Penn. Gov.'s School for the Sciences	Computer science core course, 97, 98, 99, 00, 01, 02
	Computer science team projects, 00, 02
	Machine learning elective, 01, 02
Carnegie Mellon (teaching assistant)	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