

Elizabeth Shoop

Curriculum Vitae

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Education

1995 Ph.D. Computer Science University of Minnesota
1990 M.S. Computer Science University of Minnesota
1982 B.S. Aerospace Engineering University of Minnesota

Employment

2007–present Associate Professor, Macalester College
2001–2007 Assitant Professor, Macalester College
1996–2001 Senior Researcher and Adjunct Professor, University of Minnesota
1995–1996 Postdoctoral Fellow, University of Minnesota
1989–1995 Teaching Asistant & Research Assistant, University of Minnesota
1991–1994 Part-time Software Developer, Cray Research
1986–1988 Programmer, TRW Space Systems
1982–1986 Wind Tunnel Test Engineer, Northrop Corporation

Publications

I have authored 19 peer-reviewed papers, 6 of which have appeared after I received tenure in 2007. The papers are separated below into my main areas of interest: computer science education research, bioinformatics research, and genomics and bioinformatics education.

CS Education Papers

1. Brown, R. and E. Shoop (2012). CSinParallel and Synergy for Rapid Incremental Addition of PDC Into CS Curricula. In: *Parallel and Distributed Processing Symposium Workshops (IPDPSW), 2012 IEEE 26th International*, pp.1329–1334. doi: 10.1109/IPDPSW.2012.166.
2. Shoop, E., R. Brown, E. Biggers, M. Kane, D. Lin, and M. Warner (2012). Virtual clusters for parallel and distributed education. In: *Proceedings of the 43rd ACM technical symposium on Computer Science Education. SIGCSE '12*. New York, NY, USA: ACM, pp.517522. ISBN: 978-1-4503-1098-7. doi: 10.1145/2157136.2157287. <http://doi.acm.org/10.1145/2157136.2157287>.
3. Brown, R. and E. Shoop (2011). Modules in community: injecting more parallelism into computer science curricula. In: *Proceedings of the 42nd ACM technical symposium on Computer science education. SIGCSE '11*. ACM ID: 1953293. Dallas, TX, USA: ACM, pp.447–452. ISBN: 978-1-4503-0500-6. doi: 10.1145/1953163.1953293.
4. Garrity, P., T. Yates, R. Brown, and E. Shoop (2011). WebMapReduce: an accessible and adaptable tool for teaching map-reduce computing. In: *Proceedings of the 42nd ACM technical symposium on Computer science education. SIGCSE '11*. ACM ID: 1953221. Dallas, TX, USA: ACM, pp.183–188. ISBN: 978-1-4503-0500-6. doi: 10.1145/1953163.1953221.
5. Brown, R., E. Shoop, J. Adams, C. Clifton, M. Gardner, M. Haupt, and P. Hinsbeeck (2010). Strategies for preparing computer science students for the multicore world. In: *Proceedings of the 2010 ITiCSE working group reports on Working group reports. ITiCSE-WGR '10*. ACM ID: 1971689. Ankara, Turkey: ACM, pp.97–115. ISBN: 978-1-4503-0677-5. doi: 10.1145/1971681.1971689.
6. Wagner, P. J., E. Shoop, and J. V. Carlis (Jan. 2003). Using scientific data to teach a database systems course. In: *ACM SIGCSE Bulletin*. Vol. 35. ACM ID: 611975. New York, NY, USA: ACM, pp.224–228. doi: 10.1145/792548.611975.

Bioinformatics Research Papers

1. Shoop, E., P. Casaes, G. Onsongo, L. Lesnett, E. O. Petursdottir, E. K. Y. Donkor, D. Tkach, and M. Cosimini (Dec. 2004). Data exploration tools for the Gene Ontology database. *Bioinformatics (Oxford, England)* 20(18). PMID: 15271779, 3442–3454.

2. Vodkin, L. O. et al. (Sept. 2004). Microarrays for global expression constructed with a low redundancy set of 27,500 sequenced cDNAs representing an array of developmental stages and physiological conditions of the soybean plant. *BMC Genomics* 5. PMID: 15453914, 73.
3. Johnson, J. E., M. V. Stromvik, K. A. T. Silverstein, J. A. Crow, E. Shoop, and E. F. Retzel (July 2003). Table-View: portable genomic data visualization. *Bioinformatics (Oxford, England)* 19(10). PMID: 12835275, 1292–1293.
4. Shoemaker, R. et al. (Apr. 2002). A compilation of soybean ESTs: generation and analysis. *Genome / National Research Council Canada = Gnome / Conseil national de recherches Canada* 45(2). PMID: 11962630, 329–338.
5. Shoop, E, K. A. Silverstein, J. E. Johnson, and E. F. Retzel (Mar. 2001). MetaFam: a unified classification of protein families. II. Schema and query capabilities. *Bioinformatics (Oxford, England)* 17(3). PMID: 11294791, 262–271.
6. Silverstein, K. A., E Shoop, J. E. Johnson, A Kilian, J. L. Freeman, T. M. Kunau, I. A. Awad, M Mayer, and E. F. Retzel (Jan. 2001). The MetaFam Server: a comprehensive protein family resource. *Nucleic acids research* 29(1). PMID: 11125046, 49–51.
7. Silverstein, K. A., E Shoop, J. E. Johnson, and E. F. Retzel (Mar. 2001). MetaFam: a unified classification of protein families. I. Overview and statistics. *Bioinformatics (Oxford, England)* 17(3). PMID: 11294790, 249–261.
8. Allona, I, M Quinn, E Shoop, K Swope, S St Cyr, J Carlis, J Riedl, E Retzel, M. M. Campbell, R Sederoff, and R. W. Whetten (Aug. 1998). Analysis of xylem formation in pine by cDNA sequencing. *Proceedings of the National Academy of Sciences of the United States of America* 95(16). PMID: 9689143, 9693–9698.
9. Chi, E. H.-h., J. Riedl, E. Shoop, J. V. Carlis, E. Retzel, and P. Barry (1996). Flexible information visualization of multivariate data from biological sequence similarity searches. In: *Proceedings of the 7th conference on Visualization '96. VIS '96*. Los Alamitos, CA, USA: IEEE Computer Society Press, pp.133ff. ISBN: 0-89791-864-9. <http://dl.acm.org/citation.cfm?id=244979.245041>.
10. Chi, E. H.-h., P. Barry, E. Shoop, J. V. Carlis, E. Retzel, and J. Riedl (1995). Visualization of Biological Sequence Similarity Search Results. In: *Proceedings of the 6th conference on Visualization '95. VIS '95*. Washington, DC, USA: IEEE Computer Society, pp.44. ISBN: 0-8186-7187-4. <http://dl.acm.org/citation.cfm?id=832271.833835>.
11. Engstrom, S. M., E Shoop, and R. C. Johnson (Feb. 1995). Immunoblot interpretation criteria for serodiagnosis of early Lyme disease. *Journal of clinical microbiology* 33(2). PMID: 7714202, 419–427.
12. Shoop, E., J. Srivastava, P. Bieganski, J. Riedl, and E. Retzel (1993). An object-oriented genetics information system. In: *Proceedings of the 1993 ACM/SIGAPP symposium on Applied computing: states of the art and practice. SAC '93*. New York, NY, USA: ACM, pp.641651. ISBN: 0-89791-567-4. DOI: 10.1145/162754.167189. <http://doi.acm.org/10.1145/162754.167189>.

Genomics and Bioinformatics Education

1. Shaffer, C. D. et al. (2010). The genomics education partnership: successful integration of research into laboratory classes at a diverse group of undergraduate institutions. *CBE life sciences education* 9(1). PMID: 20194808, 55–69.

Other Scholarship

The following were also peer-reviewed and accepted for presentation. I have listed only those after I received tenure.

Panel or Discussion Sessions Led

1. Brown, R. A., J. C. Adams, D. P. Bunde, J. Mache, and E. Shoop (2012). A stratified view of programming language parallelism for undergraduate CS education. In: *Proceedings of the 43rd ACM technical symposium on Computer Science Education. SIGCSE '12*. New York, NY, USA: ACM, pp.8182. ISBN: 978-1-4503-1098-7. DOI: 10.1145/2157136.2157162. <http://doi.acm.org/10.1145/2157136.2157162>.
2. Brown, R. A., E. Shoop, J. C. Adams, D. P. Bunde, J. Mache, P. F. Steinberg, M. Wolf, and M. Wrinn (2012). Sharing incremental approaches for adding parallelism to CS curricula (abstract only). In: *Proceedings of the 43rd ACM technical symposium on Computer Science Education. SIGCSE '12*. New York, NY, USA: ACM, pp.747747. ISBN: 978-1-4503-1098-7. DOI: 10.1145/2157136.2157417. <http://doi.acm.org/10.1145/2157136.2157417>.

Workshops Taught

1. Brown, R., E. Shoop, and J. Adams (2012). CSInParallel: An incremental approach to adding PDC throughout the CS curriculum. In: *Educators' Workshop in Proceedings of SuperComputing 2012*.
2. Brown, R. A. and E. Shoop (2012). CS in parallel: modules for adding parallel computing to CS courses, from CS2 to theory of computation (abstract only). In: *Proceedings of the 43rd ACM technical symposium on Computer Science Education*. SIGCSE '12. New York, NY, USA: ACM, pp.663663. ISBN: 978-1-4503-1098-7. doi: 10.1145/2157136.2157357. <http://doi.acm.org/10.1145/2157136.2157357>.
3. Brown, R. and E. Shoop (2010). The New Wave of Parallelism, Part I: Teaching Map-Reduce at Multiple Levels in the CS Curriculum. In: *41st ACM technical symposium on Computer science education (SIGCSE)*.

Symposium Presentations

1. Brown, R. and E. Shoop (2011). A Modular Approach to Teaching Parallelism at All Levels of CS Curricula. In: *Proceedings of the 2011 Midwest Instruction and Computing Symposium*. <http://www2.css.edu/mics/Submissions/submissions/Modular%20Approach%20to%20Teaching%20Parallelism%20at%20All.pdf>.
2. Shoop, E. and R. Brown (2011). Parallelism in a Data Structures course using Java threads and concurrent data structures. In: *Proceedings of the 2011 Midwest Instruction and Computing Symposium*.
3. Shoop, E., C. Clifton, R. Brown, J. Adams, M. Gardner, and M. Haupt (2010). Early and often: Bringing more parallelism into undergraduate Computer Science. In: *SPLASH 2010 Workshop on Curricula for Concurrency and Parallelism*.
4. Shoop, E., P. Hinsbeeck, and R. Brown (2010). Towards a community of Computer Science educators who teach more parallelism. In: *SPLASH 2010 Workshop on Curricula for Concurrency and Parallelism*.

External Grants Received

Only grants received post-tenure are listed below. I have received two other smaller NSF grants in the past.

Years	Amount	Granting Agency, Program	Project Title
2012–2015	\$600,000	National Science Foundation, Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (TUES)	CS in Parallel: Scaling an Incremental Modular Approach to Injecting Parallel Computing Throughout CS Curricula

This is a collaborative grant with Richard Brown at St. Olaf College and Joel Adams at Calvin College. We received this note from NSF when awarded: "Your award is one of about 30 new TUES Type 2 and 3 and Central Resource Project awards that will be made by the Division of Undergraduate Education this year. These awards are a result of the evaluation of 414 proposals submitted in January 2012. Thus, your project is in a select group nationwide."

Years	Amount	Granting Agency, Program	Project Title
2010–2012	\$200,000	National Science Foundation, Course, Curriculum, and Laboratory Instruction (CCLI)	Responding to manycore: A strategy for injecting parallel computing education throughout the computer science curriculum

This is a collaborative grant with Richarg Brown at St. Olaf College.

Years	Amount	Granting Agency, Program	Project Title
2009–2014	\$586,000	National Science Foundation, Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)	Into the Community: Changing Perceptions and Increasing Participation in Computer Science

This is a scholarship and mentoring program for CS majors and minors at Macalester.

Service

Professional Service

- I am a member of the IEEE Computer Society.
- I am a member of the Association of Computing Machinery (ACM).
- I have served on 3 NSF proposal review panels in the past 5 years.
- I routinely review 1-3 articles per year for journals or conference proceedings.
- I am active in the ACM Special Interest Group on Computer Science Education (SIGCSE) and attend the annual SIGCSE meeting every year. Over the past 3 years I have been particularly active at the annual SIGCSE meeting, where I have led panels, taught workshops, moderated paper sessions, presented papers, and have been featured in the Intel Corporation booth of the vendor session.

Macalester College Service

Pre-tenure

- I served on the Web Advisory Committee and the IDIM (independent major) review committee.
- I redesigned our department web site in 2007.
- I have organized occasional evening sessions for students in our 'Beyond Mac' series.

Post-tenure

- 2010 – 2012 I served on the Student Learning Committee (SLC), where we drafted the now fully-endorsed Statement of Student Learning for Macalester College.
- 2010 – 2012 I served on the General Education Requirements Committee, during the period when the Writing requirement and the Quantitative Reasoning requirement were being assessed. I chaired this committee in 2011 – 2012 and wrote the final report for the Quantitative Reasoning requirement assessment.
- 2011 – 2012 I was elected to and served on the Resources and Planning Committee. We wrote two reports to senior staff during that academic year, one on faculty and staff compensation and one recommending improvements to the study-away program to keep its costs down.
- Spring 2012 – Fall 2012 I am a member of a Faculty Learning Community group tasked with two principle goals: 1) create and class-test a rubric for potential use across campus for assessing Writing requirement courses; and 2) develop a series of recommendations for creating an improved writing program at Macalester.
- I have accompanied women students to the national Grace Hopper Celebration of Women in Computing.
- I have taken students and led a session in a local conference for women in computing held at the University of Minnesota for the past 2 years.
- I meet regularly in evening sessions with our Macalester IT Scholars (those awarded the NSF scholarships in the grant mentioned above).

Throughout my career

- Every year I assist Professor Fox with a local programming contest. In addition, every Fall semester we either host an additional regional ACM-sponsored contest at Macalester where student teams compete with other schools or I accompany those teams to another school in our region. This work involves judging the problem solutions that students submit. When Macalester hosts, which we have done four times in the past seven years, I also set up the software for running the contest and assist with other preparations such as getting food and t-shirts and setting up rooms for each student team to work in.