

Susan H. Rodger

Professor of the Practice

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October 31, 2009

I. Education

Ph.D.	Computer Science	Purdue University	August 1989
	Advisor: Frederickson		
M.S.	Computer Science	Purdue University	May 1985
B.S.	Computer Science	North Carolina State University	May 1983
B.S.	Mathematics	North Carolina State University	May 1983

II. Professional Appointments

Professor of the Practice

September 2008–present. Duke University, Durham, NC.

Associate Professor of the Practice

September 1997–August 2008. Duke University, Durham, NC.

Assistant Professor of the Practice

September 1994–August 1997. Duke University, Durham, NC.

Assistant Professor

September 1989–August 1994, Rensselaer Polytechnic Institute, Troy, NY.

Teaching Assistant and Research Assistant

August 1983–August 1989, Purdue University, West Lafayette, IN.

Programmer

May 1984–August 1984, International Business Machines, Raleigh, NC.

Programmer

May 1983–August 1983, International Business Machines, Raleigh, NC.

Undergraduate Research Assistant

August 1982–May 1983, North Carolina State University, Raleigh, NC.

Systems Programmer

December 1981–January 1983, University Systems Control Center, Raleigh, NC.

III. Honors and Awards

Finalist Candidate for NEEDS Premier Award for Excellence in Engineering Education Courseware, 2007, for software JFLAP. (Susan Rodger and her students Thomas Finley, Stephen Reading, Bartlett Bressler, Ryan Cavalcante, Jinghui Lim, Chris Morgan, and Kyung Min (Jason) Lee), 2007.

ACM Distinguished Member, 2006.

Rensselaer Distinguished Teaching Fellowship, Rensselaer Polytechnic Institute, July 1994 (one of three awards campus-wide).

Lilly Teaching Fellowship, July 1991–June 1992.

IV. Publications

Books, Monographs:

- Susan H. Rodger and Peter Linz, JFLAP Activities for Formal Languages and Automata (CD Supplement to An Introduction to Formal Languages and Automata, Fourth Edition), ISBN 9780763772024, Jones and Bartlett, 2008.
- Susan H. Rodger and Thomas W. Finley, JFLAP - An Interactive Formal Languages and Automata Package, ISBN 0763738344, Jones and Bartlett, 2006.
- Susan H. Rodger, *Parallel Job Scheduling Algorithms*, Ph.D. thesis, Computer Science Department, Purdue University, December 1989.

Journals:

- S. H. Rodger, "Using Animation, Virtual Worlds, Pair Programming and Activities to Introduce Computer Science," in *Interactive Multimedia Electronic Journal of Computer-Enhanced Learning*, *imej.wfu.edu* Vol. 4, No. 2, 2002.
- S. H. Rodger, "Integrating Hands-On Work into the Formal Languages Course via Tools and Programming," in *Lecture Notes in Computer Science: Automata Implementation: First International Workshop on Implementing Automata, WIA '96, London, Ontario*, Vol. 1260, Springer-Verlag, p. 132-148, 1997.
- E. Walker and S. Rodger, "PipeLINK: Connecting Women and Girls in the Computer Science Pipeline," *Journal of Computer Science Education*, Vol. 11, No. 3, p. 25-29, 1997.
- G. N. Frederickson and S. H. Rodger, "An NC Algorithm for Scheduling Unit-Time Jobs with Arbitrary Release Times and Deadlines," *SIAM Journal on Computing*, Vol. 23, No. 1, p. 185-211, 1994.
- D. Caugherty and S. H. Rodger, "NPDA: A Tool for Visualizing and Simulating Nondeterministic Pushdown Automata," in *Computational Support for Discrete Mathematics, DIMACS Series in Discrete Mathematics and Theoretical Computer Science*, Vol. 15, N. Dean and G. E. Shannon (ed.), p. 365-377, 1994.
- G. N. Frederickson and S. H. Rodger, "A New Approach to the Dynamic Maintenance of Maximal Points," *Discrete and Computational Geometry*, Vol. 5, No. 4, p. 365-374, 1990.

Refereed Conferences:

- Susan H. Rodger, Jenna Hayes, Gaetjens Lezin, Henry Qin, Deborah Nelson, Ruth Tucker, Mercedes Lopez, Stephen Cooper, Wanda Dann and Don Slater, Engaging Middle School Teachers and Students with Alice in a Diverse Set of Subjects, *Fourtieth SIGCSE Technical Symposium on Computer Science Education*, p.271-275, 2009.
- Susan H. Rodger, Eric Wiebe, Kyung Min Lee, Chris Morgan, Kareem Omar, and Jonathan Su, Increasing Engagement in Automata Theory with JFLAP, *Fourtieth SIGCSE Technical Symposium on Computer Science Education*, p.403-407, 2009.
- Susan Horwitz, Susan Rodger, Maureen Biggers, David Binkley, C. Kolin Frantz, Dawn Gundermann, Susanne Hambrusch, Steven Huss-Lederman, Ethan Munson, Barbara Ryder, and Monica Sweat, Using Peer-Led Team Learning to Increase Participation and Success of Under-Represented Groups in Introductory Computer Science, *Fourtieth SIGCSE Technical Symposium on Computer Science Education*, p.163-167, 2009.
- Susan H. Rodger, Jinghui Lim, and Stephen Reading, Increasing Interaction and Support in the Formal Languages and Automata Theory Course, *The 12th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2007)*, p.58-62, 2007.

- Susan H. Rodger, An Innovative Approach with Alice for Attracting K-12 Students to Computing, *International Conference on the Virtual Computing Initiative (IBM University Days)*, Research Triangle Park, NC, p. 17, May 2007.
- Susan H. Rodger, Bart Bressler, Thomas Finley, and Stephen Reading, Turning Automata Theory into a Hands-on Course, *Thirty-seventh SIGCSE Technical Symposium on Computer Science Education*, p. 379-383, 2006.
- Casey Alt, Owen Astrachan, Jeffrey Forbes, Richard Lucic, and Susan Rodger, Social Networks Generate Interest in Computer Science, *Thirty-seventh SIGCSE Technical Symposium on Computer Science Education*, p. 438-442, 2006.
- Susan H. Rodger, "Learning Automata and Formal Languages Interactively with JFLAP," *The Eleventh Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2006)*, University of Bologna, p.360, 2006.
- Ryan Cavalcante, Thomas Finley and Susan H. Rodger, "A Visual and Interactive Automata Theory Course with JFLAP 4.0," *Thirty-fifth SIGCSE Technical Symposium on Computer Science Education*, p. 140-144, 2004.
- Ayonike Akingbade, Thomas Finley, Diana Jackson, Pretesh Patel and Susan H. Rodger, "JAWAA: Easy Web-Based Animation from CS 0 to Advanced CS Courses," *Thirty-fourth SIGCSE Technical Symposium on Computer Science Education*, p. 162-166, 2003.
- Owen L. Astrachan, Robert C. Duvall, Jeff Forbes, and Susan H. Rodger, "Active Learning in Large to Small Courses," *Frontiers in Education 2002*, Boston, Massachusetts, p. T2A:16-20, November 2002.
- S. H. Rodger, Using Hands-on Visualizations to Teach Computer Science from Beginning Courses to Advanced Courses, *Second Program Visualization Workshop*, Hornstrup Centert, Denmark, p. 103-112, June 2002.
- S. H. Rodger, "Introducing Computer Science Through Animation and Virtual Worlds," *Thirty-third SIGCSE Technical Symposium on Computer Science Education*, p. 186-190, 2002.
- T. Hung and S. H. Rodger, "Increasing Visualization and Interaction in the Automata Theory Course," *Thirty-first SIGCSE Technical Symposium on Computer Science Education*, p. 6-10, 2000.
- E. Gramond and S. H. Rodger, "Using JFLAP to Interact with Theorems in Automata Theory," *Thirtieth SIGCSE Technical Symposium on Computer Science Education*, p. 336-340, 1999.
- W. Pierson and S. H. Rodger, "Web-based Animations of Data Structures Using JAWAA," *Twenty-ninth SIGCSE Technical Symposium on Computer Science Education*, p. 267-271, 1998.
- O. Astrachan and S. H. Rodger, "Animation, Visualization, and Interaction in CS 1 Assignments," *Twenty-ninth SIGCSE Technical Symposium on Computer Science Education*, p.317-321, 1998.
- A. O. Bilka, K. H. Leider, M. Procopiuc, O. Procopiuc, S. H. Rodger, J. R. Salemme and E. Tsang, "A Collection of Tools for Making Automata Theory and Formal Languages Come Alive," *Twenty-eighth SIGCSE Technical Symposium on Computer Science Education*, p. 15-19, 1997.
- M. Procopiuc, O. Procopiuc, and S. Rodger, "Visualization and Interaction in the Computer Science Formal Languages Course with JFLAP," *1996 Frontiers in Education Conference*, Salt Lake City, Utah, p. 121-125, 1996.
- E. L. Walker and S. H. Rodger, "PipeLINK: Connecting Women and Girls in the Computer Science Pipelink," *National Educational Computing Conference '96*, p. 378-384, 1996.
- S. H. Rodger, "Integrating Animations into Courses," *ACM SIGCSE/SIGCUE Conference on Integrating Technology in Computer Science Education (ITiCSE 1996)*, Barcelona, Spain, p. 72-74, 1996.
- S. H. Rodger and E. L. Walker, "Activities to Attract High School Girls to Computer Science," *Twenty-seventh SIGCSE Technical Symposium on Computer Science Education*, p. 373-377, 1996.

- S. H. Rodger, "An Interactive Lecture Approach to Teaching Computer Science," *Twenty-sixth SIGCSE Technical Symposium on Computer Science Education*, p.278-282, March 1995.
- S. A. Blythe, M. C. James, and S. H. Rodger, "LLparse and LRparse: Visual and Interactive Tools for Parsing," *Twenty-fifth SIGCSE Technical Symposium on Computer Science Education*, p. 208-212, March 1994.
- E. Luce and S. H. Rodger, "A Visual Programming Environment for Turing Machines," *Proceedings of the 1993 IEEE Symposium on Visual Languages*, p. 231-236, August 1993.
- M. LoSacco and S. H. Rodger, "FLAP: A Tool for Drawing and Simulating Automata," *ED-MEDIA 93, World Conference on Educational Multimedia and Hypermedia*, p. 310-317, June 1993.
- R. Trahan and S. H. Rodger, "Simulation and Visualization Tools for Teaching Parallel Merge Sort," *Twenty-fourth SIGCSE Technical Symposium on Computer Science Education*, p. 237-241, February 1993.
- S. H. Rodger, "An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes Maximum Lateness," *Proceedings of the Twenty-Sixth Annual Allerton Conference on Communication, Control and Computing*, p. 293-302, 1988. A more detailed version appears as Purdue University, Computer Science Department, Technical Report CSD-TR-798.
- G. N. Frederickson and S. H. Rodger, "A New Approach to the Dynamic Maintenance of Maximal Points In a Plane," *Proceedings of the Twenty-fifth Annual Allerton Conference on Communication, Control and Computing*, p. 879-888.

Unrefereed Reports:

- Guido Rossling, Thomas L. Naps, Mark S. Hall, Ville Karavirta, Andreas Kerren, Charles Leska, Andres Moreno, Rainer Oechsle, Susan H. Rodger, Jaime Urquiaz-Fuentes, and J. Angel Velazquez-Iturbide, "Merging Interactive Visualizations with Hypertextbooks and Course Management," ITiCSE 2006 Working Group Report, SIGCSE Bulletin, Vol. 38, No. 4, p. 166-181, 2006.
- Valerie J. Harvey and Susan H. Rodger, Editorial for the Special Issue on Software Support for Teaching Discrete Mathematics, *Journal on Educational Resources in Computing (JERIC)*, Vol. 5, Issue 2, p. 1-16, June 2005.
- Susan Horwitz, Steve Huss-Lederman, Susan Rodger, Maureen Biggers, David Binkley, Hubert Dunsmore, Barbara Ryder, and Ethan Munson, "Increasing the Representation of Undergraduate Women and Minorities in Computer Science," *Proceedings The National Science Foundation's ITWF & ITR/EWF Principal Investigator Conference*, p. 206-208, Philadelphia, Pennsylvania, October 2004.
- Thomas L. Naps (co-chair), Guido Rossling (co-chair), Vicki Almstrum, Wanda Dann, Rudolf Fleischer, Chris Hundhausen, Ari Korhonen, Lauri Malmi, Myles McNally, Susan Rodger and J. Angel Velazquez-Iturbide, "Exploring the Role of Visualization and Engagement in Computer Science Education," *Report of the Working Group on "Improving the Educational Impact of Algorithm Visualization"*, SIGCSE Bulletin, Vol. 35, No. 2, p. 131-152, June 2003.
- Susan H. Rodger, "Teaching Automata Theory with JFLAP, Guest Column" *SIGACT News*, Vol. 30, No. 4, p.53-56, 1999.
- O. L. Astrachan, G. Chapman, S. H. Rodger, and M. A. Weiss, "The Reasoning for the Advanced Placement C++ Subset," *SIGCSE Bulletin*, Vol. 29, No. 4, p.62-65, 1997.
- Susan H. Rodger, "Report on The First International Workshop on Implementing Automata 1996," *SIGACT News*, Vol. 27, No. 4, p.38-39, 1996.
- J. Bergin, K. Brodie, M. Goldweber, R. Jimenez-Peris, S. Khuri, M. Martinez, M. McNally, T. Naps, S. Rodger, and J. Wilson, "An Overview of Visualization: Its Use and Design," *Report of Visualization Working Group, ACM SIGCSE/SIGCUE Conference on Integrating Technology in Computer Science Education*, Barcelona, Spain, p. 192-200, 1996.

- S. H. Rodger, "Tools for Automata, Parsing, and Parallel Mergesort," SIGACT News, Vol. 25, No. 2, p. 48-49, June 1994.
- B. Sinharoy, A. Marron, B. Szymanski, and S. H. Rodger, "A Survey of Large Systems," IBM Technical Report TR 00.3681, Apr. 1992.

Software: JFLAP

JFLAP - JFLAP is a package of tools for teaching formal languages and automata theory including experimenting with automata, pushdown automata, multi-tape Turing machines, building block Turing machines, Moore and Mealy machines, regular grammars, regular expressions, context-free grammars, unrestricted grammars, brute-force parsing, LL parsing, SLR parsing, and L-systems. Furthermore, one can interactively explore construction type proofs such as converting an NFA to a DFA to a minimal state DFA and then to a regular expression, or convert a CFG to an NDPA. JFLAP and other tools have been under development since 1990, first as NPDA, then FLAP, and now JFLAP. Other tools developed that eventually got integrated into JFLAP include LLParse, LRparse, JeLLRap, Pate, and Lsystem. JFLAP is used around the world in over 160 countries. Since 1996, the JFLAP web site has over 200,000 hits. From Jan. 2003 to June 2006, JFLAP was downloaded over 35,000 times from the JFLAP web site. For more information see www.jflap.org

Software: Other items and Dates for JFLAP development

Availability Many of these tools are available on <http://www.jflap.org> or <http://www.cs.duke.edu/~rodger/tools/>

- JFLAP 6.4 - Modifications include an algorithm for converting a Turing machine program to an equivalent unrestricted grammar and several small features such as automatically adding a trap state to make a DFA complete, using a file as input, and JFLAP identifying the type of grammar. 2008 (with K. Lee and J. Su).
- JFLAP - Modifications and additions including JFLAP Tutorial, CYK Parsing, User-Control Parser, Graph layouts, and improvements to Pumping Lemma. 2007 (with C. Morgan and K. Lee).
- JFLAP - Modifications and additions including Moore and Mealy machines, Regular and Context-Free Pumping Lemma, and Batch Testing. 2006 (with S. Reading and J. Lim)
- JFLAP - Modifications and additions including Building Block Turing machines. 2005 (with S. Reading and B. Bressler).
- JAWAA - Modifications and additions including graphs and layouts to JAWAA and additional functionality to the JAWAA editor. 2005 (with A. Gibson and V. Gartland).
- JFLAP 4.0b12 - Modifications and additions including changing file formats to XML. 2004 (with T. Finley).
- JFLAP 4.0 - A complete rewrite of JFLAP below creates an easier to use interface and more interaction on algorithms. There are several new additions into JFLAP that double the number of topics taught. These additions include new algorithms (NFA to regular expression), LL and LR parsing, grammar transformations, L-systems, and brute-force parsing. 2002-2003 (with T. Finley and R. Cavalcante)
- JFLAP - A tool written in Java for graphically designing and animating programs for four types of automata: finite automata, pushdown automata, 1-tape Turing machines and 2-tape Turing machines. Special features include handling nondeterminism, automatic verification of input, and tracing capabilities. In addition, students can save and retrieve their designs. In 1998 additional features for exploring proofs for converting NFA to DFA, DFA to minimal state DFA, and NFA to regular grammar were added. In 1999, regular expressions and conversions from NFA to regular expression, and regular expression to NFA were added. 1996-1999, (with M. Procopiuc, O. Procopiuc, E. Gramond, and T. Hung).

- FLAP - FLAP (Formal Languages and Automata Package) is the C++ predecessor of JFLAP. 1991-1995, (with D. Caugherty, M. LoSacco, and G. Badros).
- JAWAA 2.0 and JAWAA Editor. JAWAA 2.0 is a new version of JAWAA that is more robust than the older version and includes new features. In addition, the JAWAA Editor is a new tool for novices to use to create an animation using key frames. One can layout the animation graphically and then modify it across time. 2001-2002 (with P. Patel, T. Finley, D. Jackson, and A. Akingbade).
- JAWAA 1.0 - JAWAA is a simple command language for creating animations of data structures and displaying them with a Web browser. Commands are stored in a script file that is retrieved and run by the JAWAA applet when the applet's Web page is accessed through the Web. JAWAA commands allow for creation and movement of primitive objects (circles, lines, text, rectangles) and data structure objects (arrays, stacks, queues, lists, trees and graphs). A JAWAA script can be generated as the output of a program written in any language. JAWAA was developed in 1996-1997 (with W. Pierson).
- Animated CompSci Concepts - A collection of animations to teach computer science concepts written in Flash. 2002. (with J. Morgan, D. Presslar, and B. Byrnes).
- LLparse and LRparse - Instructional tools for constructing parse tables in steps for LL(1), LL(2) and LR(1) grammars, and then simulating the parsing of input strings using the constructed table and a stack. 1992-1996, (with S. Blythe, U. Dogrusou, M. James, and E. Tsang).
- JeLLRap - A Java version of LLparse and LRparse in one tool. 1997-1998, (with A. Karweit, E. Gramond, and R. Geer).
- Lsystem - Tool for generation l-systems, 1998, (w/ L. Ramm).
- Pate - Tool for parsing and transforming grammars. The parsing component allows one to parse restricted (regular and context-free) and unrestricted grammars, showing the actual derivation and parse tree. The transformation component is an instructional tool for converting a context-free grammar to CNF form with steps for removing lambda productions, unit productions, and useless productions. 1996, (with A. Bilska and J. Salemme). In 1999, Pate was updated to include more interaction and a parse tree for unrestricted grammars (with T. Hung).
- PumpLemma - An instructional tool for applying the pumping lemma to nonregular languages to prove these languages are not regular. 1996, (with K. Leider).
- Algorithm Animations - Algorithm animations were developed using Xtango. These animations include red-black trees, 2-3 trees, red-blue line intersection problem, and dynamic m-contour tree, 1992-1996, (with A. Candib, J. Diaz-Perez, N. Rose and E. Stretch).
- TuBB - Tool for designing and simulating Turing machines that allows the user to construct large modular examples using previously defined Turing machines (building blocks). 1992-1993, (with E. Luce).
- Xcs - A tool for visualizing and simulating the parallel merge sort algorithm developed by Cole. Different data and sampling strategies can be selected. 1991, (with R. Trahan).

Online Tutorials:

- JFLAP Tutorial (www.jflap.org/tutorial) - extensive online tutorial on JFLAP including examples and files, 2007.
- Alice Tutorials (www.cs.duke.edu/csed/alice/aliceInSchools/workshop08/tutorials.php) - Over 25 Tutorials on the Alice Programming language targetted towards Grades 5-12, 2008.

Pictures of Cakes published:

- The Wiggles Big Red Car Cake including the four Wiggles, *The Wiggles*, Issue 42, page 26, 2004.

V. Service

Service - Computer Science

NCWIT representative for Duke Computer Science Department, 2007-2010.

Site Director for the ACM Mid-Atlantic Regional Programming Contest, 1996-2008.

University Service - Duke

Department Representative on Arts & Sciences Council, 2008-2009.

Chair of the Interactive Computer Classroom Scheduling Committee, 1998-1999, 2000-2004.

Department Representative on Arts & Sciences Council, 2002-2003.

Department Representative on Arts & Sciences Council, 2001-2002.

Chair of the Interactive Computer Classroom Task Force, 2000-2001.

Chair of the Interactive Computer Classroom Task Force, 1998-1999.

Director of Undergraduate Studies, 1998-1999.

Committee for The Suzanne E. and Margaret A. Franks Gender and Science Research Award, 1999, and 2000.

Pre-Major Advisor - 1995-96, 1997-98, 1998-99, 2000-01, 2001-02, 2002-03, 2003-04, 2004-05, 2005-06, 2006-07, 2007-08, 2008-09.

Faculty Associate (Southgate Dorm) - 1995-96.

Computer Science Department Committees and Service - Duke

ACM-W Duke Student Chapter Faculty Advisor, 2008-2009.

ACM Duke Student Chapter Faculty Advisor, 1996-2009.

Undergraduate Education Committee, 2004-2005

Faculty Search Committee, 1996-1997

Computer Science Internship Program Director - 1995-present.

Graduate Admissions Committee - 1995-96, 1997-98, 1998-99, 1999-00, 2000-01, 2001-02, 2002-03, 2003-04, 2005-06.

Duvall Reappointment Committee, 2003, 2005(Chair).

Forbes Reappointment Committee, 2003 (Chair), 2006 (Chair).

ACM Programming Team Coach 1994, 1995, 1997. (with O. Astrachan) - In 1994, the Duke team won the Mid-Atlantic Regionals contest. In the International Finals Contest, Duke placed 23rd out of 38 teams. In 1995, in the ACM Mid-Atlantic Regional Programming Contest, Duke teams placed 9th, 11th, and 14th out of 74 teams. In 1997, Duke team placed third in the ACM Mid-Atlantic Regional Programming Contest.

Undergraduate Majors Advising - 1995-present

Space Committee, 1998-present

University Service - Rensselaer Polytechnic Institute

Library Advisory Committee - 1991-92.

Conversation Partner Program, The Learning Center, 1990-1993 (student: Fei Meng).

Freshmen Computing Orientation Tutorials for RCS Workstations - August 1991, August 1992, August 1993.

Faculty Intervention Program - Spring 1991, Spring 1992.

Marshall at Commencement - May 1991, May 1992.

Computer Science Department Committees and Service - Rensselaer

Computer Science Qualifying Exam Committee - 1993-94.

Undergraduate Curriculum Committee - 1993-1994.

Graduate Curriculum Committee - 1992-1993.

Computer Science Theory Preliminary Exam Committee - 1990–1993.

Computer Science Department Library Representative - 1991-1992.

Computer Science Mathematics Preliminary Exam Committee - 1992.

Colloquium Chair - 1990-91.

Undergraduate Retention Committee - 1989-90.

Accepted Students' Open House - April 1990, April 1991, April 1993, April 1994.

Computer Science Representative for Discover Rensselaer Day, demonstrated animations of algorithms and data structures - November 13, 1993.

Computer Science Representative at Open House for High School Students - October 12, 1992.

Undergraduate student advising and counseling, 1990–1994.

Community and Public Service

Judge for Holy Spirit Elementary School Science Fair – April 23, 1993.

Judge for Holy Spirit Elementary School Science Fair – April 14, 1994.

VI. Editorship of Journals, Reviews of Manuscripts, Books, and Research Proposals

Editorship of Journals

2005 Co-Editor Special Issue on Software Support for Teaching Discrete Mathematics
Journal of Educational Resources in Computing, Vol. 5, Issue 2, June 2005 (with Valerie Harvey).

Referee Journals and Conferences

2009	1 paper	Computer Science Education Journal
2008	2 papers	Journal of Visual Languages & Computing
	3 papers	SIGCSE 2009
	4 panels	SIGCSE 2009
	2 special sessions	SIGCSE 2009
	4 papers	SoftVis 2008
2007	Animations	Judge for ACMSE 2007 Digital Animation Festival
	1 paper	Computer Science Education Journal
2006	2 papers	ITICSE 2006
2005	9 papers	SoftVis 2005
	1 paper	SIGCSE 2006
	1 paper	Journal of Educational Resources in Computing
2003	1 paper	Computer Surveys
	3 papers	SIGCSE 2004
2002	4 papers	FIE 2002
	1 paper	Computer Science Education Journal
	8 special sessions	SIGCSE 2003
	3 papers	ITiCSE 2003
2001	1 paper	ACM Journal on Educational Resources in Computing (JERIC)
	1 paper	International Journal of Human Computer Studies
	1 paper	Computer Science Education Journal
	3 papers	FIE 2001
	3 papers	SIGCSE 2002 Technical Symposium on Computer Science Education
	3 papers	ITiCSE 2002
2000	2 papers	SIGCSE 2001 Technical Symposium on Computer Science Education
	5 papers	The Tenth International World Wide Web Conference 2001
1999	3 papers	SIGCSE 2000 Technical Symposium on Computer Science Education
	3 papers	ITiCSE 99
1998	3 papers	SIGCSE 1999 Technical Symposium on Computer Science Education
	3 papers	Workshop on Implementing Automata 1998
1997	3 papers	SIGCSE 1998 Technical Symposium on Computer Science Education
	3 papers	Workshop on Implementing Automata 1997
1996	2 papers	SIGCSE 1997 Technical Symposium on Computer Science Education
	6 papers	Workshop on Implementing Automata 1996
1995	3 papers	SIGCSE 1996 Technical Symposium on Computer Science Education
	1 paper	SIAM Journal on Computing
1994	1 paper	Discrete & Computational Geometry
	2 papers	IEEE Computer
	1 paper	SIGCSE 1995 Technical Symposium on Computer Science Education
1993	1 paper	Transactions on Knowledge and Data Engineering
	3 papers	IEEE Symposium on Visual Languages
1992	1 paper	IEEE Symposium on Parallel and Distributed Processing
	1 paper	Transactions on Knowledge and Data Engineering
1991	1 paper	Information Processing Letters

Referee Grant Proposals

2009	12 proposals	National Science Foundation Panelist for CCLI
2007	10 proposals	National Science Foundation Panelist for CCLI
2003	10 proposals	National Science Foundation Panelist for ITR
2001	10 proposals	National Science Foundation Panelist for IGERT
1997	1 proposal	MONTS, Montana State University
1996	10 proposals	National Science Foundation Panelist for EHR-CCD
	1 proposal	MONTS, Montana State University
1992	6 proposals	NASA

Referee Fellowships

- 2009 Chair of CS Panel for National Science Foundation Graduate Research Fellowships
- 2008 Panelist for National Science Foundation Graduate Research Fellowships
- 2007 Panelist for National Science Foundation Graduate Research Fellowships
- 2005 Panelist for National Science Foundation Graduate Research Fellowships
- 2004 Panelist for National Science Foundation Graduate Research Fellowships
- 1998 Panelist for National Science Foundation Research Fellowships for Minority Graduates

Referee Books

- 2009 Pearson
- 2005 Thomson Course Technology
- 2003 Prentice Hall (2 books)
- 2002 Prentice Hall
- 2001 Addison Wesley
- 1997 McGrawHill
- 1996 Oxford University Press
Addison Wesley
- 1995 Oxford University Press
Harper Collins
- 1994 John Wiley & Sons
Addison Wesley
- 1993 John Wiley & Sons
- 1992 John Wiley & Sons

VII. Committees, Conference, Programs, and Workshop Activities

Conference and Program Chairs

Symposium Co-Chair for Thirty-ninth SIGCSE Technical Symposium on Computer Science

Education 2008 - Coordinate all conference activities including evaluating conference sites, assembling a conference committee, making arrangements for food and meeting spaces, lining up sponsors, and serving as host of the conference. SIGCSE 2008 was attended by over 1200 educators. (2005-2008)

2008 - Responsible for all arrangements and logistics for the conference including wireless network, audio visual, catering, hotels, convention center, conference layouts and assignments, exhibit hall, created a Kids Camp/daycare for the conference, keynote speakers (videotaped speakers for the first time), photographer, running the conference March 10-15, 2008 and completing all paperwork and financial statement in May 2008.

2007 - 2nd and 3rd site visit to Portland, program committee meeting, negotiations with hotels and convention center, development of web site and documents, lining up supporters and exhibitors, keynotes and daycare provider, setups of rooms, AV, wireless, and food.

2006 - Committee completed, preparation of call, web site, and documents.

2005 - Site visit to Portland, Oregon. Contract negotiation with hotels and convention center. Begin formation of SIGCSE 2008 committee.

Program Co-Chair for Thirty-eighth SIGCSE Technical Symposium on Computer Science Education

2007 - Responsible for technical content of complete program including papers, panels, special sessions, posters, workshops, and birds of a feather. (2006-2007)

Program Committee Members and Session Chairs

Program Committee Member for The Third International Conference on the Virtual Computing Initiative (ICVCI 3), October 22-23, 2009.

SIGCSE Supporter/Exhibitor Liason for Forty-first SIGCSE Technical Symposium on Computer Science Education 2009.

SIGCSE Supporter/Exhibitor Liason for Fortieth SIGCSE Technical Symposium on Computer Science Education 2008.

Program Committee Member for SoftVis '08, reviewing and acceptances of papers, 2008.

Program Committee Member for Thirty-sixth SIGCSE Technical Symposium on Computer Science Education 2005, Panels and Special Sessions Chair - organized the submission, reviewing and acceptances of panels and special sessions, 2004-2005.

Program Committee Member for SoftVis '05, reviewing and acceptances of papers, 2004-2005.

Program Committee Member for Tenth International World Wide Web Conference, May 2001.

Program Committee Member for Third International Workshop on Implementing Automata, September, 1998.

Program Committee Member for Second International Workshop on Implementing Automata, September, 1997.

Program Committee Member and Session Chair for First International Workshop on Implementing Automata, August 1996.

Session chair at IEEE Symposium on Visual Languages, August 25-27, 1993.

Committees

<i>Member, ACM Education Policy Committee</i> 2008-2009.	<i>Association of Computing Machinery</i>
<i>Member, ACM Senior Member Award Committee</i> 2006-2009. Awards for Senior Member are decided on four times a year.	<i>Association of Computing Machinery</i>
<i>Member, ACM Java Task Force</i> 2003-2005. Responsible for reviewing the Java Language, APIs and tools from the perspective of the introductory level and to develop a collection of stable resources helpful in teaching Java.	<i>Association of Computing Machinery</i>
<i>Member, ACM JETT Committee</i> 2002-2003. JETT (Java Engagement for Teacher Training). Responsible for developing materials and planning workshops to prepare teachers for the Computer Science Advanced Placement exam as it moves to Java.	<i>Association of Computing Machinery</i>
<i>Chair, AP Computer Science Development Committee</i> 1997-2000. Responsible for developing curriculum and devising tests for the Computer Science Advanced Placement exam.	<i>The College Board</i>
<i>Member, AP Computer Science Development Committee</i> 1995-2001. Responsible for developing curriculum and devising tests for the Computer Science Advanced Placement exam.	<i>The College Board</i>

Organization of Programs

Adventures in Alice Programming. - Ran two one-week summer camps introducing Alice for grades 5-12 at Duke University, Durham, NC. Week 1 was July 7-11, 2008 and was attended by 16 students. Week 2 was July 14-18, 2008 and was attended by 20 students.

Duke Emerging Scholars in Computer Science program - Developed a new one-year program for first-year students with little or no experience with computer science. Students take four computer science courses, CompSci 4 and CompSci 18S in the fall, and CompSci 6 and CompSci 18S again in the spring. The program runs from Fall 2005 to Spring 2008.

PipeLINK Summer Program - Organized and ran a two-week computer science residence program for 20 high school girls. The girls learned about many areas in computer science through hands-on activities, talks, visits to labs, and visits to nearby companies. Rensselaer Polytechnic Institute, July 30, 1995 - August 11, 1995 (with E. Walker).

Organization of Workshops/Symposiums

- “Adventures in Alice Programming Workshop” for K-12 teachers. Three one-week workshops, One hundred teacher participants total and eight presenters, June 22-26, June 28-July 2, and July 6-10, 2009 This workshop consisted of instruction on Alice. Duke University, Durham, NC.
- “Alice Symposium,” Over 120 participants. June 17, 2009 at Duke University, Durham, NC. (with W. Dann and S. Cooper).
- Peer-Led Team Learning Workshop, Indiana University, Bloomington, Indiana, January 9, 2009.
- “Adventures in Alice Programming Workshop” for K-12 teachers. Three week workshop, Thirty-seven teacher participants and seven presenters, June 16-20, June 23-27, July 7-11, and July 14-18, 2008 (the third week for teachers was split between two weeks). This workshop consisted of instruction on Alice and the development of lesson plans. Duke University, Durham, NC.
- “Peer Led Team Learning in Computer Science Workshop,” Two day workshop, 73 participants, April 28-29, 2007 at Duke University, Durham, NC.
- “HarambeNet Workshop” Two-day workshop on Computer Science and Social Networks, 12 participants, July 11-12-2006 at Duke University, Durham, NC. (with Astrachan, Forbes, and Lucic)
- “Alice Symposium,” Tracks for Beginners and Advanced users of the software Alice. 110 participants. June 19-21, 2006 at Duke University, Durham, NC. (with W. Dann and S. Cooper).
- “JFLAP Faculty Adopter Workshop”, Two-day workshop for Faculty adopters and evaluators involved with the JFLAP NSF grant. 17 participants. June 12-13, 2006 at Duke University, Durham, NC.
- “A Hands-on Approach to Formal Languages and Automata with JFLAP”, Three hour workshop at the Thirty-seventh SIGCSE Technical Symposium on Computer Science Education, 8 participants attended. March 4, 2006, Houston, Texas (with T. Finley and P. Linz).
- “Alice Workshop,” Two-day workshop for learning the software Alice. June 11-12, 2005 at Duke University, Durham, NC. 29 participants attended. (with W. Dann and S. Cooper).
- “JFLAP Faculty Adopter Workshop”, Two-day workshop for Faculty adopters and evaluators involved with the JFLAP NSF grant. 18 Participants. June 9-10, 2005 at Duke University, Durham, NC.
- “ACM JETT AP Computer Science Workshops”. Two one day workshops on beginning Java for AP CS high school teachers. March 29, 2003 and May 17, 2003 at Duke University, Durham, NC. 20 Participants for the first workshop and 19 for the second workshop (with O. Astrachan).
- “Workshop on First Year Instruction: FYI 2000”. Two day workshop on the first year of computer science instruction held at Duke University, July 15-16, 2000. 63 participants attended (with O. Astrachan).
- “AP Computer Science Workshops,” Two 2-day workshops for high school teachers. The first workshop was about C++ in AP CS A, and was held June 20-21, 1998 at Duke University. . The second workshop was about C++ in AP CS AB, and was held June 22-23, 1998 at Duke University. Twenty-five people attended each workshop. (with O. Astrachan).
- “Workshop on Interactive and Visual Tools,” Workshop to examine available interactive and visual tools for computer science and their integration into the classroom, Attended by 35 faculty from over 20 colleges and universities, Duke University, Saturday, March 30, 1996.
- “Workshop 4: PipeLINK - Connecting Women across the CS Pipeline,” Participants included teachers from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, October 21, 1995 (with E. Walker).

- “Workshop 3: PipeLINK - Connecting Women across the CS Pipeline,” Participants included teachers from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, May 13, 1995 (with E. Walker).
- “Workshop 2: PipeLINK - Connecting Women across the CS Pipeline,” Participants included teachers from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, January 28, 1995 (with E. Walker).
- “Workshop 1: PipeLINK - Connecting Women across the CS Pipeline,” Participants included teachers from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, October 1, 1994 (with E. Walker).

VIII. Professional and Public Lectures

Conferences

- “Attracting Kids to Computer Science via Programming in Virtual Worlds,” Duke Virtual Reality and Serious Games Symposium, Duke University, Durham, NC, October 23, 2008, (invited talk).
- “The Teaching of Computing Should be Challenging, Exciting and Hands-On: Then They Will Come,” Broadening Participation in Computing Disciplines Conference, Virginia Beach, VA, October 10, 2008, (invited talk).
- “Adventures in Alice Programming: K-12 Outreach,” K-12 Day at IBM University Days, Research Triangle Park, NC, October 30, 2007.
- “Increasing Interaction and Support in the Formal Languages and Automata Theory Course,” The 12th Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE 2007), Dundee, Scotland, June 25, 2007.
- “An Innovative Approach with Alice for Attracting K-12 Students to Computing,” International Conference on the Virtual Computing Initiative (IBM University Days), Research Triangle Park, NC, May 7, 2007.
- “Turning Automata Theory into a Hands-on Course,” Thirty-seventh SIGCSE Technical Symposium on Computer Science Education, Houston, Texas, March 3, 2006.
- “A Visual and Interactive Automata Theory Course with JFLAP 4.0,” *Thirty-fifth SIGCSE Technical Symposium on Computer Science Education*, Norfolk, Virginia, March 4, 2004.
- “JAWAA: Easy Web-Based Animation from CS 0 to Advanced CS Courses,” *Thirty-fourth SIGCSE Technical Symposium on Computer Science Education*, Reno, Nevada, February 21, 2003.
- “Introducing Computer Science Through Animation and Virtual Worlds,” *Thirty-third SIGCSE Technical Symposium on Computer Science Education*, Northern Kentucky, March 1, 2002.
- “Increasing Visualization and Interaction in the Automata Theory Course,” *Thirty-first SIGCSE Technical Symposium on Computer Science Education*, Austin, TX, March 9, 2000.
- “Using JFLAP to Interact with Theorems in Automata Theory,” *Thirtieth SIGCSE Technical Symposium on Computer Science Education*, New Orleans, LA, March 27, 1999.
- “Web-based Animations of Data Structures Using JAWAA,” *Twenty-ninth SIGCSE Technical Symposium on Computer Science Education*, Atlanta, GA, February 27, 1998.
- “Animation, Visualization, and Interaction in CS 1 Assignments,” *Twenty-ninth SIGCSE Technical Symposium on Computer Science Education*, Atlanta, GA, February 28, 1998.
- “A Collection of Tools for Making Automata Theory and Formal Languages Come Alive,” *Twenty-eighth SIGCSE Technical Symposium on Computer Science Education*, San Jose, CA, February 27, 1997.

- “Integrating Hands-On Work into the Formal Languages Course via Tools and Programming,” *Workshop on Implementing Automata*, London, Ontario, August 30, 1996.
- “PipeLINK: Connecting Women and Girls in the Computer Science Pipelink,” *National Educational Computing Conference '96*, Minneapolis, MN, June 20, 1996.
- “Integrating Animations into Courses,” *ACM SIGCSE/SIGCUE Conference on Integrating Technology in Computer Science Education*, Barcelona, Spain, June 4, 1996.
- “Activities to Attract High School Girls to Computer Science,” *Twenty-seventh SIGCSE Technical Symposium on Computer Science Education*, Philadelphia, PA, February 16, 1996.
- “An Interactive Lecture Approach to Teaching Computer Science,” *SIGCSE Technical Symposium on Computer Science Education*, Nashville, TN, March 3, 1995.
- “LLparse and LRparse: Visual and Interactive Tools for Parsing,” *SIGCSE Technical Symposium on Computer Science Education*, Phoenix, Arizona, March 11, 1994.
- “A Visual Programming Environment for Turing Machines,” *IEEE Symposium on Visual Languages 1993*, Bergen, Norway, August 26, 1993.
- “FLAP: A Tool for Drawing and Simulating Automata,” *ED-MEDIA 93, World Conference on Educational Multimedia and Hypermedia*, Orlando, FL, June 24, 1993.
- “Simulation and Visualization Tools for Teaching Parallel Merge Sort,” *SIGCSE '93 Technical Symposium*, Indianapolis, IN, February 19, 1993.
- “An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes the Maximum Lateness,” *Twenty-sixth Annual Conference on Communication, Control, and Computing*, Monticello, Illinois, September 28, 1988.
- “A New Approach to the Dynamic Maintenance of Maximal Points in a Plane,” *Twenty-fifth Annual Conference on Communication, Control, and Computing*, Monticello, Illinois, October 1, 1987.

Workshops

- “Increasing Engagement in Automata Theory,” *Visual Thinking Workshop*, Duke University, Durham, NC, May 4 2009 (invited talk).
- “Teaching Strategies and Learning Styles,” *CRAW Workshop - Managing the Academic Career for Faculty Women at Undergraduate Computer Science and Engineering Institutions*, Chattanooga, TN, March 4, 2009, (invited talk).
- “Teaching Strategies and Learning Styles,” *CRAW Workshop - Managing the Academic Career for Faculty Women at Undergraduate Computer Science and Engineering Institutions*, Cincinnati, OH, March 7, 2007, (invited talk).
- “Teaching Computer Science with Interaction and Visualization,” *Workshop on Current Progress of Education and Research in Computer Science*, Duke University, Dec. 4, 2006. (invited talk)
- “Integrating Visualization and Interaction into Automata Theory,” *JHave Workshop*, Grand Valley State University, June 14, 2006. (invited talk)
- “Current and Future CS Projects for Women and Minorities at Duke,” *IBM University Day*, IBM, Research Triangle Park, NC, April 26, 2006. (invited talk)
- “Duke Emerging Scholars in CS,” *NSF ITWF Workshop on Peer-Led Team Learning*, University of Wisconsin-Madison, Madison, Wisconsin, April 23, 2006.
- “Attracting and Retaining Under-represented Groups in CS,” *NSF ITWF Workshop on Peer-Led Team Learning*, University of Wisconsin-Madison, Madison, Wisconsin, April 24, 2006 (with Horwitz, Ryder, Munson, Binkley, Huss-Lederman, Sweat, and Biggers).
- “Teaching Strategies and Learning Styles,” *CRAW Workshop - Managing the Academic Career for Faculty Women at Undergraduate Computer Science and Engineering Institutions*, St. Louis, MO, February 23, 2005, (invited talk).

- “Using Hands-on Visualizations to Teach Computer Science from Beginning Courses to Advanced Courses”, Second Program Visualization Workshop, Hornstrup Centret, Denmark, June 28, 2002.
- “Using JFLAP for Visualization and Interaction in the Automata Theory Course,” Software Visualization Workshop, Dagstuhl, Germany, May 25, 2001.
- “Visual Demonstrations of Automata and Parsing,” Interactive and Visual Tools Workshop, Duke University, March 30, 1996.
- “Interactive Lecture on Binomial Heaps,” Interactive Learning Workshop, Rensselaer Polytechnic Institute, April 13, 1994.
- “Computers in Teaching the Foundations of Computer Science,” Computers in Science Education and Training Workshop, Acadia University, Wolfville, Nova Scotia, June 15, 1992.

Colloquia

- “Computer Science Concepts Come Alive,” Computer Science Department Colloquium, The Citadel, Feb. 20, 2007.
- “A New Approach to Introductory Programming - Building Virtual Worlds with Alice,” Computer Science Department, Durham Technical Community College, Durham, NC, October 7, 2005.
- “A New Approach to Introductory Programming - Building Virtual Worlds with Alice,” Visualization Seminar, Duke University, Durham, NC, September 23, 2005.
- “An Interactive and Visual Approach to Learning Computer Science,” Department of Computer Science, University of Houston, Houston, Texas, November 30, 2004.
- “Learning Computer Science Concepts via Interactive Visualizations,” Department of Computer Science, Johns Hopkins University, Baltimore, MD, July 24, 2003.
- “Animation, Visualization and Interaction with Computer Science Concepts,” Department of Mathematics and Computer Science, Wake Forest University, Winston-Salem, NC, December 1, 1998.
- “Animations as a Foundation in Computer Science Courses, Visualizations as an Integral Component to Understanding,” Department of Computer Science, Georgia Tech, Atlanta, GA, February 25, 1998. (with O. Astrachan)
- “Interactive Algorithm Animation Tools,” Algorithms and Complexity Seminar, Department of Computer Science, Duke University, Durham, NC, April 7, 1995.
- “Introduction to Computational Geometry,” Department of Computer Science, Duke University, Durham, NC, April 22, 1994.
- “Interactive Algorithm Animation,” Department of Computer Science, Vassar College, Poughkeepsie, NY, April 30, 1993.
- “An NC Algorithm for Scheduling Unit-Time Jobs with Arbitrary Release Times and Deadlines,” Computer Science Department, State University of New York, Albany, NY, March 13 1991.
- “Sequential and Parallel Algorithms for Scheduling Problems,” Computer Science Department, Williams College, Williams, MA, November 2, 1990.
- “An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes the Maximum Lateness,” Computer Science Department, Rensselaer Polytechnic Institute, Troy, NY, April 18, 1989.
- “The Design of Efficient Algorithms for Some Geometric Problems,” Computer Science Department, Union College, Schenectady, NY, April 13, 1989.
- “An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes the Maximum Lateness,” Computer Science Department, University of Pittsburgh, Pittsburgh, PA, April 11, 1989.

- “The Design of Efficient Algorithms for Some Geometric Problems,” Computer Science Department, Albright College, Reading, Pennsylvania, March 23, 1989.
- “The Design of Efficient Algorithms for Some Geometric Problems,” Computer Science Department, Juniata College, Huntingdon, Pennsylvania, March 17, 1989.
- “The Design of Efficient Algorithms for Some Geometric Problems,” Computer Science Department, Bucknell University, Pennsylvania, March 16, 1989.
- “An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes the Maximum Lateness,” Computer Science Department, Villanova University, Philadelphia, PA, March 13, 1989.
- “An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes the Maximum Lateness,” Computer Science Department, University of Tennessee, Knoxville, TN, February 27, 1989.
- “An Optimal Parallel Algorithm for Preemptive Job Scheduling that Minimizes the Maximum Lateness,” Research Triangle Park Theory Seminar, North Carolina State University, Raleigh, NC, December 2, 1988.

Panels and Special Sessions

- ”Best Practices for Introductory Computer Science,” Panelist, The Grace Hopper Celebration of Women in Computing Conference, Tucson, Arizona, October 1, 2009.
- “Findings, Challenges and Recommendations in Academia,” Panelist, The Grace Hopper Celebration of Women in Computing Conference, Keystone, Colorado, October 2, 2008.
- “Automata Theory - Its Relevance to Computer Science Students and Course Contents,” Panelist, *Thirty-seventh SIGCSE Technical Symposium on Computer Science Education*, Houston, Texas, March 2, 2006.
- “The ACM Java Task Force: Final Report,” Panelist, *Thirty-seventh SIGCSE Technical Symposium on Computer Science Education*, Houston, Texas, March 2, 2006.
- “Animation and Visualization in the Curriculum: Opportunities, Challenges, and Successes,” Panelist, *Thirty-seventh SIGCSE Technical Symposium on Computer Science Education*, Houston, Texas, March 3, 2006.
- “The ACM Java Task Force: Status Report,” Panelist, *Thirty-sixth SIGCSE Technical Symposium on Computer Science Education*, St. Louis, Missouri, February 24, 2005.
- “Being an Effective Teacher,” Panelist, *The Fifth Grace Hopper Celebration of Women In Computing*, Chicago, Illinois, October 8, 2004.
- “Panel on Teaching Faculty Positions,” Panelist, *Thirty-fifth SIGCSE Technical Symposium on Computer Science Education*, Norfolk, Virginia, March 5, 2004.
- “How To Develop and Grade an Exam for 20,000 Students (or maybe just 200 or 20),” Panelist for Special Session, SIGCSE Technical Symposium on Computer Science Education, Northern Kentucky, p. 285-286, March 2, 2002.
- “AP CS Goes OO,” Panelist for Special Session, SIGCSE Technical Symposium on Computer Science Education, Charlotte, NC, p. 423-424, February 23, 2001.
- “Current and Future Direction of the Advanced Placement Exam,” Panelist, SIGCSE Technical Symposium on Computer Science Education, New Orleans, LA, March 26, 1999.
- “Advanced Placement Transition to C++,” Panelist, SIGCSE Technical Symposium on Computer Science Education, Atlanta, GA, February 27, 1998.
- AP Computer Science Panel, Televised to High Schools, Panelist, Hartford, Connecticut, January 16, 1998.
- “Using Visual Demonstrations,” SIGCSE Technical Symposium on Computer Science Education, Nashville, TN, March 2, 1995 (with S. Grissom, R. Ross, D. Schweitzer, T. Naps, and D. Hunkins).

Poster Sessions and Demos

- Poster: “Adventures in Alice Programming,” National Workshop on Stimulating and Sustaining Excitement and Discovery in K-12 STEM Education, Friday Institute, NC State University, Raleigh, NC, August 2, 2007.
- Demonstration: “An Interactive Approach to Formal Languages and Automata with JFLAP,” NSF Showcase at Thirty-eighth SIGCSE Technical Symposium on Computer Science Education, Cincinnati, Ohio, March 9, 2007.
- Demonstration: “Learning Automata and Formal Languages Interactively with JFLAP,” The Eleventh Annual Conference on Innovation and Technology in Computer Science Education, University of Bologna, Italy, June 28, 2006.
- “Learning How to Program through Animation and Virtual Worlds,” Instructional Technology Showcase, Duke University, April 28, 2005.
- “Converting Computer Science Courses into Visual, Interactive and Collaborative Courses,” Instructional Technology Faculty Showcase, Duke University, April 27, 2001 (With O. Astrachan)
- “JFLAP: An Aid to Studying Theorems in Automata Theory,” Integrating Technology into Computer Science Education, Dublin, Ireland, August 20, 1998 (with E. Gramond).
- Demo of JAWAA, Shaping Expectations: The Role of Technology in Science Education, NSF RAIRE Workshop, Duke University, Durham, NC, April 18, 1998.
- Demo of JFLAP, *Workshop on Implementing Automata*, London, Ontario, August 30, 1996.
- “Interactive Tools for Teaching and Learning the Foundations of Computer Science,” American Society for Engineering Education (ASEE) Conference, Washington, DC, June 24, 1996.
- “PipeLINK: Connecting Women across the Pipeline into Computer Science,” National Science Foundation Conference on Women and Science, Washington, D.C. December, 13-15, 1995 (with E. Walker).
- Poster and demos for “Visual and Interactive Tools for Teaching Computer Science,” SIGCSE 94 Technical Symposium, Phoenix, Arizona, March 10, 1994.
- “Computers and Interactive Learning,” Lilly Teaching Fellows Conference, April 4, 1992, (with Curtis Breneman, Joel Plawsky, Bruce Piper, and Dimitris Lagoudas).

Talks/Activity Days – Undergraduates

- “Integrating Visualization and Animation into the Teaching of Computer Science Courses,” The Advance Program, Duke University, February 26, 2001.
- “Growing Plants and Shapes,” Carolinas & Ohio Science Education Network (COSEN) program, Duke University, Durham, North Carolina, June 1999.
- “Growing Plants and Shapes,” Carolinas & Ohio Science Education Network (COSEN) program, Duke University, Durham, North Carolina, May 31, 1995.

Talks/Activity Days/Panels – K-12 Teachers and Students

- Poster and Demos: “Adventures in Alice Programming,” Technology Showcase, Durham Public School System, Durham Public School Resource Center, Durham, NC, March 19, 2009.
- Creating a 3D Interactive Story, Duke FEMMES Event, Duke University, February 21, 2009, (taught Alice to approximately 60 4th-6th grade girls over 4 sessions).
- Creating a 3D Interactive Story, Duke FEMMES Event, Duke University, March 1, 2008, (taught Alice to approximately 60 4th-6th grade girls over 4 sessions).

Met with teacher Kristin Bedell's Alice class, Efland Cheeks Elementary School, Efland, NC, November 7, 2008.

"Adventures in Programming with Alice," Durham Public Schools "School Days", Duke University, Durham, NC, October 23, 2008 (attended by about 32 middle schoolers from the Durham Public Schools).

"Adventures in Alice Programming," Back to School Science and Math Professional Development Institute for Grade 6-12 Science and Math Teachers in the Durham Public School System, Riverside High School, Durham, NC, August 21, 2007. (gave three two-hour hands-on presentations throughout the day, 32 people total attended.)

Creating a 3D Interactive Story, Duke University, July 19, 2007 (taught Alice to 15 high school girls participating in the Howard Hughes PreCollege program in the Biological Sciences at Duke University).

Poster: "Adventures in Alice Programming," Technology Showcase, Durham Public School System, Rogers-Herr Year-Round Middle School, Durham, NC, May 31, 2007.

"Experimenting with Grammars to Generate L-Systems," Duke Up Close Faculty Seminar, Duke University, April 10, 2007.

Blue Devil Days, Table for advertising DES-CS program. Duke University. April 6, 2007, April 20, 2007, and April 23, 2007.

Creating a 3D Interactive Story, Duke FEMMES Event, Duke University, February, 24, 2007 (taught Alice to approximately 60 4th-6th grade girls over 4 sessions.).

Math CS Panel, Open House for High School Students in NC and SC, Duke University, September 16, 2006.

Blue Devil Days, Table for advertising DES-CS program. Duke University. April 10, 2006, April 14, 2006, and April 17, 2006.

"Creating Animations and 3D Virtual Worlds - Programming for Beginners", Duke Up Close Faculty Seminar, Duke University, April 2, 2006.

Blue Devil Days, Table for advertising DES-CS program. Duke University. April 11, 2005, April 18, 2005, and April 25, 2005.

"Animated Computer Science Concepts," Roger-Herrs Middle School students activity day, Duke University, November 18, 2002 (with Jeremy Morgan and Drew Presslar).

"AP CS Exam Development Process," High School Teachers Conference, Arlington High School, Arlington, TX, December 9, 2000.

"C++ Programs, some examples," High School Teachers Conference, University High School, Irvine, CA, October 24, 1998.

"Activity Day 3 - Algorithm Animation and Statrad - The Computer Detective," PipeLINK Activity Day, Participants included high school girls from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, November 4, 1995 (with E. Walker).

"Using C++ in CS1 and CS2," High School Teachers Conference, Rice University, Houston, TX, October 28, 1995.

"The Animator," PipeLINK Summer Program, Rensselaer Polytechnic Institute, August 9, 1995.

"C++ Programming," PipeLINK Summer Program, Rensselaer Polytechnic Institute, August 7, 1995.

"Growing Shapes and Trees," PipeLINK Summer Program, Rensselaer Polytechnic Institute, August 4, 1995.

"Getting Started: Introduction to RCS, e-mail and emacs," PipeLINK Summer Program, Rensselaer Polytechnic Institute, July 31, 1995.

"Activity Day 2 - More on the Internet and Building Home Pages," PipeLINK Activity Day, Participants included high school girls from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, April 29, 1995 (with E. Walker).

- “What is Computer Science?,” Troy High School, Troy, New York, Jan. 10, 1995.
- “What is Computer Science?,” Guilderland High School, Guilderland, New York, Jan. 9, 1995.
- “Activity Day 1 - Internet Treasure Hunt and Growing Trees,” PipeLINK Activity Day, Participants included high school girls from sixteen high schools, Rensselaer Polytechnic Institute, Saturday, January 7, 1995 (with E. Walker).
- “What is Computer Science?,” Lansingburgh High School, Troy, New York, Dec. 13, 1994.
- “What is Computer Science?,” Albany High School, Albany, New York, Dec. 12, 1994.
- “What is Computer Science?,” Watervliet High School, Watervliet, New York, Dec. 2, 1994.
- “What is Computer Science?,” Emma Willard, Troy, New York, Dec. 1, 1994.
- “What is Computer Science?,” Albany Academy for Girls, Albany, New York, Oct. 28, 1994.
- “What is Computer Science?,” Averill Park High School, Averill Park, New York, Oct. 27, 1994.
- “Sorting Numbers as Shapes,” Young Scholars Program, Rensselaer Polytechnic Institute, July 28, 1994.
- “Sorting Numbers as Shapes,” Shapes Across the Sciences program for high school teachers, Rensselaer Polytechnic Institute, August 7, 1993.
- “Modeling Plants Using L-Systems,” Shapes Across the Sciences program for high school teachers, Rensselaer Polytechnic Institute, August 5, 1993.
- “On Being A Computer Scientist,” Young Scholars Program, Rensselaer Polytechnic Institute, August 13, 1992.
- “On Being a Computer Scientist,” Young Scholars Program for High School Students, Rensselaer Polytechnic Institute, Aug. 5, 1991.
- “On Being a Computer Scientist,” Young Scholars Program for High School Students, Rensselaer Polytechnic Institute, Aug. 6, 1990.

Other Talks

- “Adventures in Alice Programming: K-12 Outreach,” Durham FM Association, Durham, NC, November 13, 2007.
- “Experience the Interactive Computer Classroom,” Duke Alumni Association, Duke University, Duke University, April 21, 2001.

Interviews

- Duke News Multimedia Services, Animating Computer Programming, Video, July 6, 2009.
- Duke News and Communication, “Bringing Girls and Boys to Computer Science with ‘Alice’,” June 22, 2009.
- Duke News and Communication, “Getting Students Excited about Computer Science,” July 10, 2008.
- Instructify, “Adventures in Alice Programming Workshop at Duke University,” www.instructify.com, July 24, 2008. Blog about the Alice workshop for teachers.
- Duke Magazine, “Crossing the Digital Divide,” Sarah Bray, p. 14-19, May-June 2000. Interviewed about PipeLINK and women in computer science.
- “Does Jane Compute?: Preserving Our Daughter’s Place in the Cyber Revolution,” Roberta Furger, Warner Brothers, 1998. Mentions PipeLINK program.

IX. Professional Societies

1986 – present Association of Computing Machinery (ACM)
 1986 – present Special Interest Group on Algorithms and Computation Theory (SIGACT)
 1992 – present Special Interest Group on Computer Science Education (SIGCSE)
 1992 – present Special Interest Group on Computer and Human Interaction (SIGCHI)
 1986 – 2000 European Association for Theoretical Computer Science (EATCS)
 1992 – present Society for Industrial and Applied Mathematics (SIAM)
 1995 – present The Institute of Electrical and Electronics Engineers (IEEE) Computer Society

X. Consulting

Consultant *University at Albany-SUNY*
 2009. Review of Computer Science Department, University at Albany - SUNY, Albany, NY.
 February 23-24, 2009.

Consultant *College Board*
 2008. Attended AP Computer Science Faculty Colloquium, Chicago, Illinois, October 24-26,
 2008.

Consultant *ETS*
 2004, 2005, 2006. Reviewing/writing AP CS Materials.

Reader, AP Computer Science Exam *ETS*
 1997, 1999. Spent one week grading AP Computer Science Exams.

Consultant *IBM, Myers Corners Laboratory, Poughkeepsie, NY*
 June 1991-August 1991. Evaluated projects at IBM.

XI. Research Grants and Contracts

Proposals approved and funded

“Integrating Computer Science and Engineering into K-12 Via Teacher Workshops and the Virtual Computing Laboratory,” International Business Machines, IBM Faculty Award, \$30,000, (with Nancy Shaw and Richard Lucic). July 2009.

“Integration of Alice into Middle Schools,” Computing Research Association Distributed Mentor Project, \$6,000, June 2009 – August 2009.

“Facilitating pre-College Education with the Virtual Computing Laboratory,” International Business Machines, IBM Faculty Award, \$40,000, (with Nancy Shaw and Richard Lucic). July 2008

Supplement to “An Innovative Approach for Attracting Students to Computing: A Comprehensive Proposal,” National Science Foundation ESI ITEST DRL-0826661, \$29,920, June, 2008.

“Integration of Alice into Middle Schools,” Computing Research Association Distributed Mentor Project, \$6,000, June 2008 – August 2008.

“An Innovative Approach with Alice for Attracting Students to Computing,” \$30,000, IBM Faculty Award, June 2007.

“CPATH CB: Building Community via the Science of Networks,” National Science Foundation CNS 0722288, \$318,360, August 1, 2007 - July 31, 2009. (with J. Forbes).

“Doctoral Program in Management and Analysis of Large Data Acquired from Sensors,” Department of Education Graduate Assistance in Areas of National Need (GAANN), \$383,643 (\$479,554 with Duke matching funds) September 1, 2007 - August 31, 2010 (with Agarwal, Lucic, Tomasi, Chase, Parr, Forbes, Babu, Ellis, Yang, Bell, Harer, and Absher).

“A Web Tool for Easy Animation of Data Structures, Algorithms and More and its Integration into Computer Science Courses,” Computing Research Association Distributed Mentor Project, \$6,000, June 2007 – August 2007.

“An Innovative Approach for Attracting Students to Computing: A Comprehensive Proposal,” National Science Foundation ESI ITEST 0624642, \$161,436, February 2007 - January 2010 (This is a collaborative proposal for \$1,297,456 with St. Joseph’s University, Colorado School of Mines, Ithaca College, and Santa Clara University).

Supplement to “ITWF: Collaborative Research: Increasing the Representation of Undergraduate Women and Minorities in Computer Science,” National Science Foundation, CNS 0638510, \$39,624, July 2006.

“An Interactive Approach to Formal Languages and Automata with JFLAP,” National Science Foundation CCLI 0442513, \$359,440. May 2005–April 2009.

“A Web Tool for Easy Animation of Data Structures, Algorithms and More and its Integration into Computer Science Courses,” Computing Research Association Distributed Mentor Project, \$16,000, May 2005 – August 2005.

“ITWF: Collaborative Research: Increasing the Representation of Undergraduate Women and Minorities in Computer Science,” National Science Foundation, CNS 0420343, \$60,000, (part of a \$708,913 collaborative grant with University of Wisconsin - Madison, University of Wisconsin - Milwaukee, Georgia Tech, Purdue, Rutgers, Loyola University, Beloit College), September 2004 – August 2009.

“A Web Tool for Easy Animation of Data Structures, Algorithms and More and its Integration into Computer Science Courses,” Computing Research Association Distributed Mentor Project, \$8500, May 2002 – August 2002.

OOPSLA Educator’s Grant, \$2,000, October 2001.

IBM Sur Grant, (with Astrachan, Chase, Lucic, Trivedi, and Vahdat), \$1,700,000, July 2001. (includes \$120,000 for establishing teaching/cluster classrooms).

“Microsoft Teaching Lab,” Microsoft, (with Astrachan, Chase, Ellis, Lucic, Ramm, Vahdat, Vitter), \$1,191,470, June 2000.

“Converting Computer Science Courses into Visual, Interactive, and Collaborative Courses,” Duke University Instructional Technology Incentive Grant, (with O. Astrachan), \$5000, 1999-2000.

OOPSLA Educator’s Grant, \$1,600, October 1998.

“Visualizing and Animating Proofs in the Mathematical Foundations of Computer Science,” National Science Foundation, NSF DUE 9752583, \$48,075, Sept 1998 - August 2002.

“A Visual, Interactive, and Collaborative Classroom,” Hewlett-Packard Company \$223,179 for equipment, (with O. Astrachan), July 1998.

Microsoft Education Development Grant, Microsoft, \$50,000, 1998 (with O. Astrachan, and J. Vitter).

“CURIOUS: Center for Undergraduate Education and Research: Integration ThroUgh Performance and ViSualization,” National Science Foundation, Grant Number 9634475, \$405,200, Sept 1996 - Aug. 2000. (with O. Astrachan, P. Agarwal, A. Biermann, G. Kedem, A. Lebeck, J. Reif, D. Rose, X. Sun, and J. Vitter,).

“Algorithm Animation”, Computing Research Association Distributed Mentor Project, \$5000, July 1996–September 1996.

“Visual and Interactive Tools Incorporated into the Mathematical Foundations of Computer Science,” National Science Foundation, Grant number DUE-9555084, \$69,844 , July 1996–June 1998.

“Algorithm Animation”, Computing Research Association Distributed Mentor Project, \$5000, June 1995–August 1995.

“Connecting Women Across the Computer Science Pipeline: From High School through the Ph.D.,” National Science Foundation Model Projects for Women and Girls, Grant number HRD-9450007, \$104,963, September 1994–August 1996 (with E. Walker).

“A Visual and Interactive Approach to the Foundations of Computer Science,” National Science Foundation Course and Curriculum Development, Grant number DUE-9354791, \$66,426, July 1994–December 1996. (NOTE: \$53,618 of this grant was transferred to Duke, new Grant number DUE-9596002).

- “Algorithm Animation”, Computing Research Association Distributed Mentor Project, \$5000, May 1994–August 1994.
- “Making Theoretical Concepts in Computer Science Come Alive,” Rensselaer CIUE Development Grant Program for Educational Innovation, \$10,800, July 1993–June 1994.
- “Computer Science I: Case Studies, Graphics, Animation,” AT&T, \$9000, July 1993–June 1994 (with Robert Walker, Michael Skolnick, and David Spooner).
- “Tools for Automata and Formal Languages,” Lilly Teaching Fellowship awarded by Lilly Endowment, Inc., \$6500, July 1991–June 1992.

Proposals with Participation, but not PI

- Consultant, National Science Foundation REU Site Grant 0851569, “REU Site: EXPLORING OPEN SOURCE SOFTWARE: DEVELOPMENT AND EFFICACY OF ONLINE LEARNING ENVIRONMENTS IN COMPUTER SCIENCE,” Thomas Naps. My role is visiting the REU site, presenting, and mentoring. (2009-2011)
- Consultant, National Science Foundation CCLI-Phase 1(Exploratory) Grant 0837505, “A Cognitive-Apprenticeship Learning Curriculum Augmented by Cognitive Tutors (CAL-CT) for Fundamental Programming Concepts,” PI Wei Jin. My role is reviewing materials. (2009-2011)
- Consultant, National Science Foundation CPATH CNS Grant 0722339, “CPATH-CB: A community for lab-centric computer science instruction,” PI Michael Clancy. My role was to attend a workshop May 31-June 1, 2008 and review material. (2008-2010)
- Faculty Adopter, National Science Foundation CCLI EMD Grant 0339734, “Program Visualization Using Virtual Worlds,” PI’s Stephen Cooper, Barbara Moskel, and Wanda Dann. My role was to use the the Alice Programming language in a course for non-majors, CompSci 4, and to organize two summer workshops. The course CompSci 4 was taught twice in Spring 2005 and Fall 2005 with students surveyed on their attitudes. I ran an Alice workshop in June 2005 (29 participants) and an Alice Symposium in June 2006 (110 participants).
- Consultant, National Science Foundation CCLI EMD Grant 0341148, “Integrating Algorithm Visualization Into Computer Science Education,” PI’s Scott Grissom, Tom Naps, and Myles McNally. My role is reviewing materials created. (2005-2007)
- Consultant, National Science Foundation CCLI A&I Grant 0311407, “Increasing Interaction and Visualization in the Computability Course,” PI Rakesh Verma. My role is reviewing JFLAP materials created. (2004)
- Project ADVANCE: Developing A Resilient Cohort of Women in Quantitative Sciences, National Science Foundation Grant Number 9979478, \$99,924, (Thompson and Bertozzi), Jan. 2000 – Dec. 2000. My Role was advisor to 12 students, taught a course CPS 49S, and gave a talk on my research.

XII. Research Interests

Interactive and Visual Tools for Theoretical Computer Science, Computer Science Education, Algorithm Animation, Analysis of Algorithms, Parallel Algorithms, Data Structures, Computational Geometry.

XIII. Teaching

Courses Taught at Duke University

Date		Number	Title	Enrollment
2009	Spring	CompSci 4 (Sec 1)	Introduction to Programming - Virtual Worlds	49
	Spring	CompSci 140	Mathematical Foundations of Computer Science	12
2008	Fall	CompSci 4 (Sec 1)	Introduction to Programming - Virtual Worlds	50
	Fall	CompSci 4 (Sec 2)	Introduction to Programming - Virtual Worlds	50
	Spring	CompSci 18S	Introduction to Problem Solving	12
	Spring	CompSci 140	Mathematical Foundations of Computer Science	24
	Spring	CompSci 6	Introduction to Program Design and Analysis I	44
2007	Fall	CompSci 18S	Introduction to Problem Solving	11
	Fall	CompSci 4 (Sec 1)	Introduction to Programming - Virtual Worlds	39
	Fall	CompSci 4 (Sec 2)	Introduction to Programming - Virtual Worlds	45
	Spring	CompSci 18S	Introduction to Problem Solving	13
	Spring	CompSci 6	Introduction to Program Design and Analysis I	40
	Spring	CompSci 140	Mathematical Foundations of Computer Science	12
2006	Fall	CompSci 18S	Introduction to Problem Solving	10
	Fall	CompSci 4 (Sec 1)	Introduction to Programming - Virtual Worlds	29
	Fall	CompSci 4 (Sec 2)	Introduction to Programming - Virtual Worlds	35
	Spring	CompSci 18S	Introduction to Problem Solving	10
	Spring	CompSci 6	Introduction to Program Design and Analysis I	34
	Spring	CompSci 140	Mathematical Foundations of Computer Science	26
2005	Fall	CompSci 18S	Introduction to Problem Solving	14
	Fall	CompSci 4	Introduction to Programming - Virtual Worlds	31
	Fall	CompSci 6 (1)	Introduction to Program Design and Analysis I	13
	Fall	CompSci 6 (2)	Introduction to Program Design and Analysis I (Duvall's section - taught most of the semester while he was out)	15
	Spring	CompSci 4	Introduction to Programming - Virtual Worlds	30
	Spring	CompSci 140	Mathematical Foundations of Computer Science	22
2004	Spring	CPS 140	Mathematical Foundations of Computer Science	20
2003	Fall	CPS 6	Introduction to Program Design and Analysis I	36
	Fall	CPS 6X	Honors Introduction to Program Design and Analysis I (Team taught with O. Astrachan)	20
	Spring	CPS 140	Mathematical Foundations of Computer Science	34
2002	Fall	CPS 49S	Animation and Virtual Worlds	16
	Fall	CPS 100	Program Design and Analysis II	64
	Spring	CPS 140	Mathematical Foundations of Computer Science	40
2001	Fall	CPS 6 (1)	Introduction to Program Design and Analysis I	40
	Fall	CPS 6 (2)	Introduction to Program Design and Analysis I	38
	Spring	CPS 49S	Animation and Virtual Worlds	15
2000	Fall	CPS 6 (1)	Introduction to Program Design and Analysis I	40
	Fall	CPS 6 (2)	Introduction to Program Design and Analysis I	40
1999	Fall	CPS 6	Introduction to Program Design and Analysis I (Team taught with O. Astrachan)	180
	Fall	CPS 100E	Program Design and Analysis II (Team taught with R. Duvall)	42
	Spring	CPS 100E	Program Design and Analysis II	47
	Spring	CPS 140	Mathematical Foundations of Computer Science	46
1998	Fall	CPS 100E	Program Design and Analysis II	60
	Spring	CPS 6	Introduction to Program Design and Analysis I	140
	Spring	CPS 140	Mathematical Foundations of Computer Science	33

Date		Number	Title	Enrollment
1997	Fall	CPS 100E	Program Design and Analysis II (Team taught with R. Duvall)	62
1996	Fall	CPS 6	Introduction to Program Design and Analysis I	145
	Fall	CPS 100	Program Design and Analysis II	50
	Spring	CPS 6	Introduction to Program Design and Analysis I	107
	Spring	CPS 140	Mathematical Foundations of Computer Science	18
1995	Fall	CPS 6	Introduction to Program Design and Analysis I (Team taught with O. Astrachan)	121
	Fall	CPS 100	Program Design and Analysis II (Team taught with O. Astrachan)	56
	Fall	CPS 100E	Program Design and Analysis II (Team taught with O. Astrachan)	55
	Fall	CPS 149S	Problem Solving Seminar (Team taught with O. Astrachan)	14
	Spring	CPS 100	Program Design and Analysis II	55
	Spring	CPS 140	Mathematical Foundations of Computer Science	15
1994	Fall	CPS 6	Introduction to Program Design and Analysis I	52
	Fall	CPS 149S	Problem Solving Seminar (Team taught with O. Astrachan)	7

Notes on Duke Courses

Fall 2004: - on leave

Fall 2000 - Spring 2005 Working 3/4 time, reduced teaching load, 3 courses per year.

Spring 2000: on maternity leave.

Fall 1997, Fall 1998 - one course relief each fall for NSF CURIOUS grant.

Spring 1997: on maternity leave.

Courses Taught at Rensselaer Polytechnic Institute

Date		Number	Title	Enrollment
1994	Spring	66.217	Fundamental Structures of Computer Science II	42
1993	Fall	66.110	Computer Science 1	245
	Fall	66.217	Fundamental Structures of Computer Science II	28
	Spring	66.110	Computer Science 1	150
1992	Fall	66.621	Design and Analysis of Algorithms	13
	Fall	66.217	Fundamental Structures of Computer Science II	8
	Spring	66.217	Fundamental Structures of Computer Science II	60
1991	Fall	66.621	Design and Analysis of Algorithms (Rensselaer Satellite Video Program)	20 (on campus) 50 (off campus)
	Fall	66.216	Fundamental Structures of Computer Science I	35
	Spring	66.217	Fundamental Structures of Computer Science II (2 sections - 30 each)	60
1990	Fall	66.446	Compiler Design	18
	Spring	66.217	Fundamental Structures of Computer Science II	30
1989	Fall	66.216	Fundamental Structures of Computer Science I	40

Notes on Rensselaer Courses

Computer Science I is the first computer science course, a required course of all undergraduates. The programming language is C.

Fundamental Structures of Computer Science I and II are the third and fourth computer science courses for majors. Material from Advanced Data Structures, Analysis of Algorithms, and Automata Theory and Formal Languages are blended throughout these two courses. The programming languages were Pascal, and then later C.

Compiler Design is a senior undergraduate course.

Design and Analysis of Algorithms is a graduate course.

Course and Curriculum Development - Duke

Course: CompSci 18S - Introduction to Problem Solving

- Fall 2005 and Spring 2006 - Developed a new course for learning techniques to solve challenging computer science problems and to introduce nonmajors to the areas of computer science. Students solve problems in groups. This course is part of the Duke Emerging Scholars in Computer Science program.

Course: CompSci 4 - Introduction to Programming via Animation and Virtual Worlds

- Fall 2006 - Modified course to include two weeks of Java at the end.
- Spring 2005 - Developed a new course to teach programming that uses the tool Alice to create virtual worlds. Course is taught in a workshop format with students working in pairs.

Course: CPS 6X - Honors Introduction to Program Analysis and Design I

- Fall 2003 - Developed honors version of CPS 6. A faster paced course with a unit of StarLogo to look at examples from physical and life sciences. (with O. Astrachan).

Course: CPS 49S - Animation and Virtual Worlds

- Spring 2001 - Developed new Freshmen seminar course in the Interactive Computer Classroom, which has 20 computers, two students per computer. Designed all lectures in a workshop format, with students working on animations on the computer during lecture.

Course: CPS 6 - Introduction to Program Analysis and Design I

- Spring 2006 - Converted the Java version of this course to a workshop format. Redesigned all lectures into a short lecture followed by discovery exercises for students to work on in pairs with a computer.
- Fall 2005 - Taught course for the first time in Java. (with Duvall)
- Fall 2000 - Taught course for the first time in the Interactive Computer Classroom with 20 computers, two students per computer. Redesigned all lectures into a workshop format in which I lecture for 5 to 15 minutes, and then the students “do the lecture” with discovery exercises on the computer.
- Fall 1995 and Spring 1996 - Used the Computer during lecture to show demos of programs and to present algorithm animations of concepts during lectures. Also introduced animations into students’ programming assignments.
- Fall 1994 - Converted lectures to an interactive learning environment with group problem solving. Incorporated a lab component into this course. In addition to three lectures a week, students met one day a week in a 90 minute lab for short exercises and to learn how to use tools. The exercises consisted of short programs that needed to be debugged or modified. Tools taught included editors, newsgroups, mail, debuggers, and Mosaic.

Course: CPS 100 - Program Design and Analysis II

- Spring 1995 - Converted lectures to an interactive learning environment with group problem solving and algorithm animations shown during lecture. Incorporated algorithm animation into programming assignments.

Course: CPS 100E - Program Design and Analysis II

- Fall 1999 - Course taught in an Interactive Computer Classroom. No lectures, but rather all material taught in an interactive lab format (with R. Duvall).
- Fall 1995 - Created a new course for students with CS 1 programming experience, but no C++ experience. This course reviews material in CPS 6, and then covers the same material as CPS 100. Course has a lab component. (with O. Astrachan).

Course: CPS 140 - Mathematical Foundations of Computer Science

- Spring 1995 - Spring 2002 Incorporated several tools (JFLAP, JeLLRap, Pate, Lsys, FLAP, LLparse, LRparse, and nfa2dfa) into the course. Tools were demonstrated during lectures and used outside of class for solving homework problems. Included group problem solving during lectures.

Course: CPS 149S - Problem Solving Seminar

- Fall 1994 - Created a new seminar course for problem solving, to prepare students for the ACM programming contest. Students worked previous contest problems once a week, and two mini-contests were held. Two teams participated in the regional contest with one team placing first. (with O. Astrachan)

Course and Curriculum Development - Rensselaer

Courses: Fundamental Structures of Computer Science I and II

- Designed and developed several interactive and visual computer tools for aiding in the understanding of the fundamentals of computer science, FLAP, LLparse, LRparse, and TuBB.
- Developed several algorithm animations with the tool Xtango: binary trees, red-black trees, insertion sort, select sort, and pairing points.
- Incorporated additional tools and animations developed by others into lectures and assignments.
- Created an interactive learning environment in lectures.
 - Class problem solving using the tools and animations listed above.
 - Group problem solving.

Course: Computer Science I

- Integrated algorithm animations of sorting and searching into lectures.

XIV. Student Thesis and Project Supervision

Doctoral Theses

Joaquim Jorge, “Parsing Adjacency Grammars for Calligraphic Interfaces,” Rensselaer Polytechnic Institute, May 1995. (co-advisor with E. Glinert)

Doctoral Committee Member

Ugur Dogrusoz, “Cyclic Structure and Coloring of Graphs and Their Parallel Solutions,” Rensselaer Polytechnic Institute, July 1995.

Jon Berry, “Path Optimization of Graph Partitioning Problems: A Case Study of Near Greedy Analysis,” Rensselaer Polytechnic Institute, December 1994.

Badri Ramamurthy, “On the Bounded p-Contractability of Graphs,” Rensselaer Polytechnic Institute, April 1994.

Clark Ray, "Representing Visibility for Siting Problems," Rensselaer Polytechnic Institute, April 1994.

Masters Projects

Edwin Tsang, "Enhancement of LLparse and LRparse Instructional Tools," Duke University, December 1996.

Bhaskar Vasudevan, "Interactive Tool for Conversion of NFA to DFA," Rensselaer Polytechnic Institute, December 1994.

Gudmundur Thorri Johannesson, "Evaluation of New Approach to Dynamic Maintenance of Maximal Points in a Plane," Rensselaer Polytechnic Institute, May 1993.

Steve Blythe, "LLparse and LRparse: Interactive LL(1) and LR(1) Parsing Tutorials," Rensselaer Polytechnic Institute, May 1993.

Chris Moore, "Dynamic Maintenance of Maximal Elements," Rensselaer Polytechnic Institute, December 1992.

Mark LoSacco, "Automata Creation and Simulation Tools," Rensselaer Polytechnic Institute, December 1992.

Mike James, "A Software Tool to Aid in Understanding LL Parsing," Rensselaer Polytechnic Institute, September 1992.

Dan Caugherty, "NPDA: An Application for Building and Testing Pushdown Automata," Rensselaer Polytechnic Institute, December 1991.

Robin Trahan, "Simulation, Study, and Visualization of Cole's Parallel Merge Sort," Rensselaer Polytechnic Institute, December 1991.

Ed Stashluk, "Parallelization of an Electron Beam Lithography Post Processor," Rensselaer Polytechnic Institute, May 1990.

Graduate Independent Study Projects/Summer Projects

Magda and Octavian Procopiuc, "JFLAP: A Java Implementation of FLAP," Duke University, July 1996.

Edwin Tsang, "Readings on Human-Computer Interaction," Duke University, May 1996.

Edwin Tsang, "Readings on Software Visualization," Duke University, May 1996.

Edwin Tsang, "Animation of LL and LR Parse Trees," Duke University, August 1995.

Mohan Nibhanupudi, "Interactive Tool for Converting a Context-free Grammar to CNF format," Rensselaer Polytechnic Institute, August 1994.

Ugur Dogrusoz, Graduate Research Project, "Automatic Layout of DFA in LR Parsing," Rensselaer Polytechnic Institute, August 1994.

Undergraduate Research Projects

Lana Dyck, "Integration of Alice into Middle Schools," CRA Distributed Research Experiences for Undergraduates, Duke University, July 2009.

Maggie Bashford, "Integration of Alice into Middle Schools," Duke University, July 2009.

Liz Liang, "Integration of Alice into Middle Schools," Duke University, July 2009.

Deborah Nelson, "Integration of Alice into Middle Schools," Duke University, July 2009.

Jenna Hayes, "Integration of Alice into Middle Schools," Duke University, July 2009.

Jonathan Su, “JFLAP 7.0,” Duke University, July 2009.

Henry Qin, “JFLAP 7.0,” Duke University, August 2009.

Deborah Nelson, “Integration of Alice into Middle Schools,” Duke University, August 2008.

Jenna Hayes, “Integration of Alice into Middle Schools,” Duke University, August 2008.

Ruthie Tucker, “Integration of Alice into Middle Schools,” Duke University, August 2008.

Henry Qin, “Integration of Alice into Middle Schools,” Duke University, August 2008.

Gaetjens Lezin, “Integration of Alice into Middle Schools,” CRA Distributed Research Experiences for Undergraduates, Duke University, August 2008.

Jonathan Su, “Usage and Updating of JFLAP,” Duke University, August 2008.

Kyung Min (Jason) Lee, “JFLAP Additions for Flexibility,” Duke University, July 2008.

Kyung Min (Jason) Lee, “Turing Machine to Unrestricted Grammar in JFLAP,” Duke University, May 2008.

Kyung Min (Jason) Lee, “Updates to New Grammar and Parsing methods in JFLAP,” Duke University, December 2007.

Mercedes Lopez, “Alice Programming at the Elementary School Level,” CRA Distributed Mentor Program, Duke University, September 2007.

Chris Morgan, Duke University, “Graph Layouts and New Pumping Lemma Approach in JFLAP,” August 2007.

Kyung Min (Jason) Lee, “New Grammar and Parsing methods in JFLAP,” Duke University, August 2007.

Stephen Reading, “JFLAP Version 6.0” Duke University, Aug 2006.

Jinghui Lim, “Pumping Lemma, and Moore and Mealy Machines integrated into JFLAP.” Duke University, Aug 2006.

Stephen Reading, “Enhancements to JFLAP including Batch Grading” Duke University, May 2006.

Stephen Reading, “Enhancements to Turing Machine Building Blocks in JFLAP,” Duke University, December 2005.

Bart Bressler and Stephen Reading, “Turing Machine Building Blocks in JFLAP,” Duke University, August 2005.

Andrea Gibson, “Tree Visualization in JAWAA,” CRA Distributed Mentor Program, Duke University, August 2005.

Valerie Gartland, “Enhancements to the JAWAA editor including Array Capability,” CRA Distributed Mentor Program, Duke University, August 2005.

Tim Church and Andy Chappell, “Enhancing Online Java Tutorial,” both received Graduation with Distinction, Duke University, May 2003.

Thomas Finley, “JFLAP: The Next Iteration,” Graduation with High Distinction, Duke University, December 2002.

Jeremy Morgan and Andrew Pressler, “Evaluation of Animated Computer Science Concepts,” both received Graduation with Distinction, Duke University, December 2002.

Tim Church and Andy Chappell, “Online Java Tutorial,” Duke University, December 2002.

Ryan Cavalcante, “Improving Interaction in JFLAP,” Duke University, August 2002.

Thomas Finley, “Improving the GUI in JFLAP,” Duke University, August 2002.

Diana Jackson, “A Web Tool for Easy Animation of Data Structures, Algorithms and More and its Integration into Computer Science Courses,” CRA Distributed Mentor Program, Duke University, August 2002.

Ayonike Akingbade, “Enhancements to JAWAA,” Duke University, August 2002.

Shawn Goldberg, “Animated topics for CS 1 using Starlogo”, Duke University, August 2002.

Blake Byrnes, Jeremy Morgan and Andrew Pressler, "Animated Computer Science Concepts," Duke University, May 2002.

Thomas Finley, "An Interactive Editor for JAWAA," Duke University, August 2001.

Pretesh R. Patel, "Enhancements to JAWAA," Duke University, August 2001.

Ted Hung, "Regular Expressions to Enhance JFLAP," Duke University, August 1999.

Eric Gramond, "Extensions to JFLAP as an Aid to Proving Theorems," Duke University, August 1998.

Lenore Ramm, "Lsystems," Duke University, August 1998.

Michael Dean and Robyn Geer, "Traveling Salesman," Duke University, May 1998.

Eric Gramond, "Extensions to JFLAP: NFA to DFA to minimal DFA," Duke University, August 1997.

Robyn Geer, "JeLLRap: Java Enhanced LL and LR Animated Parsing," Duke University, August 1997.

Alex Karweit, "JeLLRap: Java Enhanced LL and LR Animated Parsing," Duke University, August 1997.

Will Pierson, "Algorithm Animation for the Classroom using Java and the Web," Graduation with Distinction, Duke University, May 1997.

Emily Stretch, "Algorithm Animation of Dynamic M-Contour with Polka," CRA Distributed Mentor Program, Duke University, September 1996.

Anna Bilka, "Pate: A Tool for a Brute Force Parser," Duke University, August 1996.

Jason Salemme, "Pate: A Tool for Grammar Transformations from Context-Free Form to CNF," Duke University, August 1996.

Ken Leider, "PumpLemma: A Tool for Exploring the Pumping Lemma," Duke University, August 1996.

Will Pierson, "Algorithm Animations for Non-Programmers," Duke University, May 1996.

Josefina Diaz-Perez, "Algorithm Animation of Dynamic M-contour," CRA Distributed Mentor Program, Duke University, August 1995.

Ben Hardekopf, "DFA to minimum DFA," Duke University, August 1995.

Steve Wolfman, "L-systems," Duke University, August 1995.

Greg Badros, "Modifications to FLAP," Duke University, May 1995.

Natasha Rose, "Algorithm Animation of 2-3 trees", CRA Distributed Mentor Program, Rensselaer Polytechnic Institute, August 1994.

Eric Luce, "Block Turing Machine Design," Rensselaer Polytechnic Institute, May 1993.

Sonia Price, "Algorithms for Graph Coloring," Rensselaer Polytechnic Institute, May 1993.

Aaron Candib, "Algorithm Animation," Rensselaer Polytechnic Institute, July 1992.

Ethan Magdovitz, "Compiler for PIE, Programming Is Easy," Rensselaer Polytechnic Institute, May 1992.

Danny Daglas, Jeffrey Nesheiwat, and Jasper Wong, "Turing Machine Implementation," Rensselaer Polytechnic Institute, May 1992.

Eric Luce, "Turing Machine Simulation," Rensselaer Polytechnic Institute, May 1992.

Grant Poladian, "Tools for Automata," Rensselaer Polytechnic Institute, May 1991.

Cheryl Wilson, "Parallel Scheduling Algorithms," Rensselaer Polytechnic Institute, August 1990.