

# Sara Sprenkle

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## Employment History

**Associate Professor of Computer Science** *May 2013 – Present*  
Head of Computer Science Department, January 2021 –  
Washington and Lee University, Lexington, VA.

**Assistant Professor of Computer Science** *July 2007 – May 2013*  
Washington and Lee University, Lexington, VA.

## Education

**University of Delaware** **Newark, DE**  
Ph.D. in Computer Science, August 2007. Thesis: *Strategies for Automatically Exposing Faults in Web Applications.*

**Duke University** **Durham, NC**  
Master's Degree in Computer Science, May 2004. Project: "Exploring Availability and Usage Guarantees in Resource Allocation Through Leases."

**Gettysburg College** **Gettysburg, PA**  
Bachelors of Science in Computer Science and Mathematics, May 1999.  
Graduated Summa Cum Laude.

## Research Interests

Automation in software testing for various domains—focused on web applications; software maintenance, software engineering; empirical methodologies; distributed systems; digital humanities.

## Teaching Experience

### **Associate/Assistant Professor, Washington and Lee University**

**Software Development (CSCI209)**, Fall 2008, 2009, 2011- 2013, 2015, 2016, 2020-2023. Third programming course for majors. Students transition from the Python programming language to Java, learn standard software development tools and techniques, and develop larger applications, culminating in a team development project. Topics include static vs dynamic typing, testing, code coverage, JUnit, interfaces, code smells, design patterns, version control, and Eclipse.

**Software Engineering through Web Applications (CSCI335)**, Springs 2010, 2013, 2016, 2019, 2021. Elective I developed for majors on designing and implementing Web applications, with a rigorous software engineering focus. Topics include iterative development, requirements gathering, distributed applications, Java servlets, JSPs, JavaScript, JSTL, usability, testing and debugging, security, and use of tools such as Eclipse Web Tools Platform, version control, browser developer tools, and Maven. Course includes a team project with a real client.

**Fundamentals of Programming I (CSCI111)**, Fall 2007, 2012, 2017, Winters 2008–2012, 2014, 2016–2019, 2021–2023. Introductory programming course for majors and non-majors in the Python programming language. Beyond the typical coverage of introductory problem solving techniques and programming, directed weekly discussions about broader issues in computer science, such as bridging the digital divide and challenges and rewards of applying computer science to other fields. A paper about the approach was accepted to the Technical Symposium of Computer Science Education, 2012.

**Operating Systems (CSCI330)**, Fall 2015, Fall 2018. Updated elective to use the project from the SIGCSE 2009 paper “Build an operating system from scratch: a project for an introductory operating systems course”.

**Algorithm Design and Analysis (CSCI211)**, Winters 2009–2014, 2016, 2018, 2019. Required core course for majors. Focused on applied problem solving. Topics covered include algorithm analysis, graphs, greedy algorithms, dynamic programming, divide and conquer, network flow, and computational intractability.

**Distributed Systems (CSCI325)**, Spring 2011, Fall 2017. Elective I developed for majors on the design and implementation of distributed systems. Topics include communication protocols (TCP, UDP, Http), routing, processes and threads, naming, synchronization, consistency and replication, fault tolerance, security, remote procedure calls, distributed file systems, and wide-area computing. Projects included using MapReduce on Amazon’s EC2 resources. Revised to 3-credit course for Fall 2017.

**Software Tools (CSCI397)**, Winter 2017, 2022. Updated elective I developed for majors on software tools to help students improve their productivity—working smarter, not harder. Topics include Unix tools, Bash scripting, version control, issue tracking, data storage, and Docker.

**Introduction to Digital Humanities: You Say You Want a Revolution (INTR203)**, Spring 2014. This project-based course introduces non-STEM majors to the use of digital technologies in humanities research and research presentation. The course is predicated on the fact that the digital turn the world has taken in the last several decades has drastically changed the nature of knowledge production and distribution. The class integrates lectures on DH and computer science with demonstrations of fully developed DH projects. Received funding from ACS R1 Collaboration grant to support instruction by graduate students from UVA’s Scholars Lab. Co-taught with Paul Youngman.

**Tools for the Software Life Cycle (CSCI297)**, Spring 2009. New elective I developed for majors on software tools to give students the tools to improve their productivity—working smarter, not harder. Students read research papers about cutting-edge software development tools. Topics include Unix tools, Bash scripting, version control, FindBugs, search/navigation tools, profiling, Mylyn, issue tracking, and refactoring.

**Human-Computer Interaction (CSCI397)**, Fall 2008. New elective I developed for majors in theories and practices of HCI. Topics include iterative design, discount usability engineering, discovery, user and task analysis, human capabilities, rapid prototyping, and hierarchical evaluation techniques. Course capstone: large development project or research proposal.

**Web Applications (CSCI297)**, Spring 2008. New elective I developed for majors on designing and implementing Web applications. Modified to a 4-week course in 2010: CSCI335.

### Course Instructor, University of Delaware

**Object-Oriented Programming in Java (CISC370)**, Summer 2006. University of Delaware. Java elective for majors, typically taken during junior year.

**General Computer Science Course (CISC105)**, Summer 2005. University of Delaware. Introductory C course for non-majors and majors without programming experience.

### Teaching Assistant, University of Delaware

**Advanced Compiler Construction (CISC672)**, Fall 2006. Taught by Dr. Lori Pollock. Graded labs and homework assignments and held office hours.

**Parallel Programming (CISC372)**, Fall 2006. Taught by Dr. Lori Pollock. Graded labs and homework assignments and held office hours.

**General Computer Science (CISC105)**, Fall 2004, Spring 2005. Taught by Mr. Terry Harvey. Led weekly lab sessions for four lab sections of course, graded labs, homework assignments, quizzes, and projects, held office hours, individual help sessions, created midterm review questions, and held midterm review session for all four sections of course.

### Journal Publications

J. Barry, J. Knudson, S. Sprenkle, and P. Youngman, "Launching the Digital Humanities Movement at Washington and Lee University: A Case Study." *The Academic Commons*. 2014.

S. Sprenkle, L. Pollock, and L. Simko. "Configuring Effective Navigation Models and Abstract Test Cases for Web Applications by Analyzing User Behavior." *Journal of Software Testing, Verification and Reliability*. Volume 23, Issue 6, pages 439–464, September 2013.

S. Sampath, S. Sprenkle, E. Gibson, A. Souter and L. Pollock, "Applying Concept Analysis to User-session-based Testing of Web Applications." *IEEE Transactions on Software Engineering*, Vol. 33, No. 10, October 2007.

K. Amiri, S. Sprenkle, R. Tewari and S. Padmanabhan, "Scalable consistency maintenance for edge query caches." *Web Content Caching and Distribution*. F. Douglis and B. Davison (Eds), Kluwer Academic Publishers, 2004.

### Conference Publications

R. Benefiel, S. Sprenkle, H. Sypniewski, and J. White. "The Ancient Graffiti Project: Geo-Spatial Visualization and Search Tools for Ancient Handwritten Inscriptions." Digital Access to Textual Cultural Heritage (DaTeCH), Göttingen, Germany, June 2017.

S. Sprenkle, C. Cobb, and L. Pollock. "Leveraging User-Privilege Classification to Customize Usage-based Statistical Models of Web Applications." International Conference on Software Testing, Verification and Validation (ICST), IEEE, Montreal, Canada, April 2012. Acceptance Rate: 27%.

S. Sprenkle and S. Duvall. "Reshaping the Image of Computer Science in Only Fifteen Minutes (of Class) a Week." SIGCSE Technical Symposium on Computer Science Education, ACM, Raleigh, NC, Feb 2012. Acceptance Rate: 34.6%.

S. Sprenkle, L. Pollock, and L. Simko. "A Study of Usage-Based Navigation Models and Generated Abstract Test Cases for Web Applications." International Conference on Software Testing, Verification and Validation (ICST), IEEE, Berlin, Germany, March 2011. Acceptance Rate: 21%. **Awarded Best Research Paper.**

S. Sprenkle, H. Esquivel, B. Hazelwood, and L. Pollock. "WEBVIZOR: A Visualization Tool for Applying Automated Oracles and Analyzing Test Results of Web Applications." In Proceedings of the *Testing: Academic & Industrial Conference, Practice and Research Techniques (TAICPART)*, IEEE, Windsor, UK, August 2008.

S. Sprenkle, L. Pollock, H. Esquivel, B. Hazelwood, and S. Ecott. "Automated Oracle Comparators for Testing Web Applications." In proceedings of the *18th IEEE International Symposium on Software Reliability Engineering (ISSRE)*, Trollhattan, Sweden, November 2007. Acceptance Rate: 30%.

S. Sampath, S. Sprenkle, E. Gibson, and L. Pollock. "Web Application Testing with Customized Test Requirements—An Experimental Comparison Study." In proceedings of the *17th IEEE International Symposium on Software Reliability Engineering (ISSRE)*, Raleigh, NC, November 2006. Acceptance Rate: 30%.

S. Sprenkle, E. Gibson, S. Sampath, and L. Pollock. "Automated Replay and Failure Detection for Web Applications." In proceedings of the *20th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, Long Beach, CA, November 2005. Acceptance Rate: 10%.

S. Sprenkle, S. Sampath, E. Gibson, L. Pollock, and A. Souter. "An Empirical Comparison of Test Suite Reduction Techniques for User-session-based Testing of Web Applications." In proceedings of the *IEEE International Conference on Software Maintenance (ICSM)*, Budapest, Hungary, September 2005. Acceptance Rate: 30%.

J. Chase, L. Grit, D. Irwin, J. Moore, and S. Sprenkle. "Dynamic Virtual Clusters in a Grid Site Manager." In proceedings of the *Twelfth International Symposium on High Performance Distributed Computing (HPDC)*, Seattle, WA, June 2003. Acceptance Rate: 20%. **Selected #4 of the Best Papers of HPDC 1992-2012.** <http://hpdc.org/best.php>

M. Chu-Carroll and S. Sprenkle. "Coven: Brewing Better Collaboration through Software Configuration Management." In proceedings of the *Eighth International Symposium on the Foundations of Software Engineering (FSE)*, San Diego, California, November 2000. Acceptance Rate: 18%.

D. Shires, L. Pollock, and S. Sprenkle. "Program Flow Graph Construction for Static Analysis of MPI Programs." In *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA)*, Las Vegas, NV, June 1999.

R. Tosten, C. Ferraro, S. Sprenkle, B. Steiner, and P. Tymann. "Using Java Remote Method Invocation in a Parallel and Distributed Processing Course." In *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA)*, Las Vegas, NV, June 1999.

C. Leinbach, R. Johnsonbaugh, R. Tosten, S. Sprenkle, and P. Tymann. "Investigating JavaRMI for a Computer Science Curriculum." In *Proceedings of the 14th annual Eastern Small Colleges Computing Conference (ESCCC)*, Marist, NY, October 1998.

## Book Chapters

S. Sampath and S. Sprenkle, "Advances in Web Application Testing, 2010-2014," in *Advances in Computers*, Memon A. (Ed), Elsevier, Vol. 101, pp 155–191, 2016.

### Workshop Publications

S. Sprenkle, E. Gibson, and L. Pollock. "Learning Effective Oracle Comparator Combinations for Web Applications." *First International Workshop on Software Test Evaluation (STEV)*, colocated with *Seventh International Conference on Quality Software (QSIC)*, Portland, OR, October 2007.

S. Sprenkle, E. Gibson, S. Sampath, and L. Pollock. "A Case Study of Automatically Creating Test Suites from Web Application Field Data." *Workshop on Testing, Analysis and Verification of Web Services and Applications (TAVWEB)*, colocated with *International Symposium on Software Testing and Analysis (ISSTA)*, Portland, ME, July 2006.

S. Sampath, S. Sprenkle, E. Gibson, and L. Pollock. "Integrating Customized Test Requirements with Traditional Requirements in Web Application Testing." *Workshop on Testing, Analysis and Verification of Web Services and Applications (TAVWEB)*, colocated with *International Symposium on Software Testing and Analysis (ISSTA)*, Portland, ME, July 2006.

S. Sampath, S. Sprenkle, E. Gibson, L. Pollock, and A. Souter. "Analyzing Clusters of Web Application User Sessions." *The Third International Workshop on Dynamic Analysis (WODA)*, colocated with *27th International Conference on Software Engineering (ICSE)*, St. Louis, MO, May 2005.

K. Amiri, S. Sprenkle, R. Tewari, and S. Padmanabhan. "Exploiting Templates to Scale Consistency Maintenance in Edge Database Caches." *The Eighth International Workshop on Web Content Caching and Distribution (WCW)*, Hawthorne, NY, September 2003.

M. Chu-Carroll and S. Sprenkle. "Software Configuration Management as a Mechanism for Multidimensional Separation of Concerns." In the *22nd International Conference on Software Engineering (ICSE2000) Workshop on Multi-dimensional Separation of Concerns*, Limerick, Ireland, June 2000.

### Other Publications

I. Crnkovic, K. Kohl Silveira, and S. Sprenkle. "Summary of the 2nd Workshop on Gender Equality in Software Engineering (GE 2019)." *ACM SIGSOFT Software Engineering Notes*. Volume 45, Issue 3, July 2020. pages 25–27. <https://doi.org/10.1145/3402127.3402138>

R. Benefiel and S. Sprenkle. "The Herculaneum Graffiti Project." as part of *Current Practice in Linked Open Data for the Ancient World*. Editors: Thomas Elliott, Sebastian Heath, John Muccigrosso. Institute for the Study of the Ancient World (ISAW) Papers 7, 7.4, 2014.

### Research Mentor

Research mentor for undergraduate projects in web application testing. Designed research projects to be completed within the given timeframe and worked closely with students to guide them through implementation and the research process, including searching for related work, reading and critiquing research papers effectively, brainstorming new strategies to problems, data analysis, setting up evaluation studies, and presenting research in poster and paper formats.

### Senior Honors Theses

Hammad Ahmad '19, "Empirically Evaluating Genetic Algorithms for Generating Test Suites for Web Applications," 2018–2019.

Azmain Amin '17, "An Automated, Customizable Framework for Applying Genetic Algorithms to Generate Test Cases for Web Applications," 2016–2017.

Johanna Goergen '16, "Leveraging Parameter and Resource Naming Conventions to Improve Test Suite Adherence to Persistent State Conditions," 2015–2016. Competed in ACM Student Research Competition at GHC 2015.

Bipeen Acharya '15, "Towards an Automated and Customizable Linear Cryptanalysis of a Substitution-Permutation Network Cipher for use in Embedded Systems," 2014–2015.

Paul Jang '15, "Customizable Method of Detecting Malicious User Activity in Web Applications," 2014–2015.

Richard Marmorstein '14, "Robot Socrates: Contradiction Identification with Minimum Questioning," 2013–2014.

Camille Cobb '12, "Exploring Text-based Analysis of Test-Case Dependencies for Web Applications," 2011–2012. Finalist in the ACM Student Research Competition at SIGCSE 2012.

### **Summer Research and Independent Studies**

Petra Ilic '24, "Paying Down Technical Debt in the Ancient Graffiti Project," Summer 2023.

Lakpa Sherpa '25, "Automating Clustering Techniques for Detecting Anomalous Behavior in Web Application Requests," Summer 2023.

Ignas Volcokas '25, "Generating Cost-Effective Test Cases for Web Applications using Genetic Algorithms," Summer 2023

Abdelrahman AboEitta '23, "Deploying ChemTutor 2.0 to the Cloud," Summer 2021, Work study 2021-2023.

Grace MacDonald '23, "Improving Data Consistency in the Ancient Graffiti Project," Summer 2022.

Armando Mendez-Anastasio '24, "ChemTutor 3.0," Summer 2022.

Lakpa Sherpa '25, "Empirical Study of Clustering Techniques for Detecting Anomalous Behavior in Web Application Requests," Summer 2022.

Jae Jung '22, "Identifying Malicious Behavior in Web Application User Sessions," Summer 2020.

Trevor Stalnaker '20, "Mapping the Streets and Properties of Pompeii in the Ancient Graffiti Project," Summer 2020.

George Barker '20, "Adding Admin Functionality and Deploying ChemTutor to the Cloud," Winter and Summer 2020.

Liam McCann '20, "Using Docker to Improve Experimental Web Application Testing Framework," Winter 2020.

George Barker '20, "Developing ChemTutor: A Place to Practice Chemistry," Summer 2019.

Trevor Stalnaker '20, "Integrating New Graffiti Data Sets into the Ancient Graffiti Project," Summer 2019.

Abby Nason '20 and Trevor Stalnaker '20, "Visualizing Graffiti Locations and Exporting Graffiti Data," Summer 2018. Nason funded by NEH ODH grant.

Hammad Ahmad '19 and Liam Mcann '20, "Generating Test Suites for Web Applications

Using Genetic Algorithms,” Summer 2018.

Ruinan Liu '20, “Detecting Anomalous Users in Web Application Accesses,” Summer and Fall 2018.

Esther Assenso '22, “Prototyping User Interface for ChemTutor, an Online Chemistry Tutorial,” Summer 2018.

Hammad Ahmad '19, Cooper Baird '19, and Kelly McCaffrey '19, “Improving Visualization and Analysis Tools for the Ancient Graffiti Project,” Summer 2017. Funded by NEH ODH grant.

Michael Dik '19, “Analyzing Web Application Access Logs for Anomalous Behavior,” Summer 2017.

Gunnar Bowman '19, “Applying and Evaluating a Hill-Climbing Algorithm to Generate Test Cases for Web Applications,” Summer 2017.

Amalia Nafal '21, “Prototyping Themed Graffiti User Interface for the Ancient Graffiti Project,” Summer 2017.

Alicia Martinez '18, “Developing Visualization and Analysis Tools for the Ancient Graffiti Project,” Summer 2016. Funded by the NEH ODH grant.

Michael Dik '19, “Upgrading the Symbolic Logic Tutorial and Developing User Interface Improvements for the Ancient Graffiti Project,” Summer 2016.

Mithra Muthukrishnan '16, “Identifying Anomalous Behavior in Web Application Access Logs.” Summer 2015, Fall 2015, Winter 2016.

Azmain Amin '17 and Mina Shnoudah '17, “Automatically Testing Web Services”, Summer 2015.

Jamie White '17, “Developing Visualization and Analysis Tools for the Ancient Graffiti Project,” Summer 2015, Work study during academic year 2015–2016.

Johanna Goergen '16 and M. Maggie Weatherly '15, “Automatically Generating Persistent State-Aware Test Cases for Web Applications”, Summer Scholars, Summer and Fall 2014.

Olivier Mahame '14 and Jean Paul Mugabe '14, “Exploring technologies for an improved statistical framework for analyzing web application logs”, Independent Study, Winter 2014.

Olivier Mahame '14, “Developing a Modern Web Application for Studying Ancient Collegium”, Independent Study, Fall 2013.

Samantha O'Dell '15 and Gabrielle Tremo '15, “Exploring Digital Humanities Tools for an Introductory Course”, Summer Scholars, Summer 2013.

Paul Jang '15, “Ancient Graffiti Search Engine”, Summer Scholar, Summer 2013.

Olivier Mahame '14, “Statistical Analysis of User-Session Data for Improved Test-Case Generation Data Models”, Independent Study, Winter 2013.

Haley Archer-McClellan '15 and Deirdre Tobin '15, “Improving Text-based Analysis of Persistent-State Dependencies for Web Applications”, R.E. Lee Scholars, Summer 2012.

Jean Paul Mugabe '14, “Learning the Factors that Predict Parameter Data Values for Web Application Testing through Statistical Analysis of User Data”, Summer 2012.

Richard Marmorstein '14, "Developing Sentential Logic Functionality for an Online Symbolic Logic Tutorial", R.E. Lee Scholar with Paul Gregory, Summer 2012.

Charles Gould '12, Infrastructure Improvements for Capturing User Accesses and Developing a New Online Publications Repository, Summer 2011.

Camille Cobb '12, Anna Pobletts '12, and Lucy Simko '11, "Dynamic Analysis of Web Application Access Logs for Software Testing." CRA-W/CDC Collaborative Research Experiences for Undergraduates (CREU), 2010-2011. Cobb '12 presented a poster of our work at the National Science Foundation in September 2011.

Kathryn Baldwin (University of Delaware '10), Camille Cobb '12, and Caroline Hopkins '12, "Exploring data models for automatically generating tests for web applications." CRA-W Distributed Research Experiences for Undergraduates (DREU), Summer 2009.

Natallia Robinson (University of Delaware, Masters '09), "A Case Study of Faults in Web Applications." Independent Study, Summer 2009.

Lucy Simko '11, "Automatically Creating Test Cases from User Accesses." R.E. Lee Scholar, Summer 2008.

Holly Esquivel (University of Nebraska-Kearney '07), "A Visualization Tool for Web Application Testing", CRA Distributed Mentor Program, Summer 2006. Honorable Mention in CRA Outstanding Undergraduate Awards 2007.

Barbara Hazelwood (Xavier University '07), "A Visualization Tool for Web Application Testing", CRA Distributed Mentor Program, Summer 2006.

Stacey Ecott (Tufts University '07), "Fault-based Mutation Operators for Web Applications", CRA Distributed Mentor Program, Summer 2005.

Frank Zappaterrini (University of Delaware '05), "Support Tools for a Capture/Replay Framework", Independent Study, January 2005, Summer 2005.

### Poster Presentations

R. Benefiel, S. Sprenkle, and P. Jang. "Herculaneum Graffiti Project: Reinvisioning the Ancient City." International Conference on Information Technologies for Epigraphy and Digital Cultural Heritage in the Ancient World. Sept 2014.

S. O'Dell, G. Tremo, and S. Sprenkle. "What are the best resources to introduce students to the digital humanities?" Grace Hopper Celebration of Women in Computing. October 2014.

R. Benefiel, S. Sprenkle, and P. Jang. "The Herculaneum Graffiti Project: Reinvisioning the Ancient City." International Conference on Information Technologies for Epigraphy and Digital Cultural Heritage in the Ancient World. Sept 2014.

L. Simko, A. Pobletts, and S. Sprenkle. "Exploring Potential Data Models to Automatically Generate Tests for Web Applications." Tapia Celebration of Diversity in Computing. April 2011.

C. Cobb and S. Sprenkle. "Toward a User-Session Dependency Model for Automatically Testing Web Applications." Tapia Celebration of Diversity in Computing. April 2011.

K. Baldwin, C. Cobb, C. Hopkins, S. Sprenkle, and L. Pollock, "Exploring Data Models for Automatically Generating Tests for Web Applications." Grace Hopper Celebration of Women in Computing. September 2009.

S. Ecott, S. Sprenkle, and L. Pollock. "Fault Seeding vs. Mutation Operators: An Empirical



Comparison of Techniques for Web Applications.” The Grace Hopper Celebration, San Diego, CA, October 2006.

S. Sprenkle, S. Sampath, E. Gibson, A. Souter, and L. Pollock. “An Empirical Comparison of Test Suite Reduction Techniques for User-session-based Testing of Web Applications.” CRA DMP Reunion, Chicago, Illinois, October 2004.

S. Sprenkle and J. Chase. “Automatic State Management for Dynamic Services Using Ivory.” 18th Symposium on Operating Systems Principles (SOSP-18), Chateau Lake Louise, Banff, Canada, October 2001.

### Oral Presentations

For presentations not associated with publications listed elsewhere.

“Thinking Like a Computer Scientist about Ancient Roman Graffiti.” Big Ancient Mediterranean (BAM), University of Iowa, June 2016.

“On Solid Ground: Building the Foundation for Women Faculty and Students in Math and Science.” Presenter in panel at the Ninth Biennial ACS Women’s and Gender Studies Conference, University of Richmond, Richmond, VA, April 2011.

“Statistical, Usage-based Models to Effectively Test Web Applications.” Invited talk at Loyola University Maryland, February 2011.

“Getting Off to a Great Start in Academia: Advice from the Other Side of the Tenure Track.” Moderator, writer for panel at the Grace Hopper Celebration of Women in Computing, October 2010. In evaluation survey, panel received a mean score of 4.5 out of 5.

“Customized Oracles to Automatically Detect Faults in Web Applications.” Invited talk at the University of Richmond’s Mathematics & Computer Science Colloquium Series, October 2009.

“Women in Computer Science.” Invited talk for KEWL (Knowledge Empowering Women Leaders) at Washington and Lee University, November 2007.

“Customized Oracles to Automatically Detect Faults in Web Applications.” Invited talk at Mt. Holyoke College, South Hadley, MA, November 2006.

“Strategies for Automatically Exposing Faults in Web Applications.” Ph.D. Forum at the *Grace Hopper Celebration of Women in Computing (GHC2006)*, San Diego, CA, October 2006.

“Strategies for Automatically Exposing Faults in Web Applications.” Doctoral Symposium at the *International Symposium on Software Testing and Analysis (ISSTA 2006)*, Portland, ME, July 2006.

“Towards Automatically Creating Test Suites from Web Application Field Data.” S. Sprenkle, E. Gibson, S. Sampath, and L. Pollock. Presented at the *Mid-Atlantic Student Workshop on Programming Languages and Systems (MASPLAS)*, Rutgers University, April 2006.

### Research and Teaching Funding

**Associated Colleges of the South, Diversity and Inclusion Grant**, PI, awarded \$27,600 for “ChemTutor 2.0,” 2020.

**Associated Colleges of the South, Diversity and Inclusion Grant**, Co-PI, awarded \$8,250 for “Pre-Chemistry Tutorial System to Improve Underrepresented Minority Representation in STEM,” 2019.

**Associated Colleges of the South, R1 Collaboration Grant**, Co-PI, awarded \$20,000 to continue partnership with the University of Virginia's Scholars' Lab on digital humanities research and pedagogy, 2017.

**Washington and Lee University Lenfest Grant**, awarded stipends for 8 weeks during summer to support research on automated web application testing and implementation of web applications (Ancient Graffiti Project, Symbolic Logic Tutorial, ChemTutor), 2015–2022.

**National Endowment for the Humanities, Office of Digital Humanities, Start-up Grant, Level II**, Co-PI with PI Rebecca Benefiel, awarded \$74,592, to support "Ancient Graffiti Project: Tools for Analyzing Personal Communication," 2016.

**The Andrew W. Mellon Foundation, Higher Education and Scholarship in the Humanities: Liberal Arts Colleges**, Co-PI (Washington and Lee University President is officially the PI), awarded \$800,000, to support "DH Studio: A Digital Humanities Pedagogical Innovation", the faculty's experimentation with digital humanities pedagogies and research, 2015.

**Associated Colleges of the South, R1 Collaboration Grant**, Co-PI, awarded \$2912 to continue partnership with the University of Virginia's Scholars' Lab on digital humanities research and pedagogy, 2015.

**Associated Colleges of the South, R1 Partnership Pilot Program Grant**, Co-PI, awarded \$4983 to develop a partnership with the University of Virginia's Scholars' Lab on digital humanities, 2014.

**Washington and Lee University Lenfest Grant**, awarded stipends for 8 weeks during summer to support research on exploring text-analysis of web applications and implementation of web-based digital humanities projects (Ancient Graffiti Project, Context Sensitivity), 2013–2014.

**Washington and Lee University Lenfest Grant**, awarded a stipend for 8 weeks during summer to support research on automatically generating test cases using statistical data models and finding inter-test case dependencies, 2012.

**CRA-W/CDC Collaborative Research Experiences for Undergraduates (CREU)**, awarded funding for 2.5 student stipends during academic year and travel funding, 2010-2011.

**Amazon EC2 Teaching Grant**, awarded to fund students in the distributed systems course using Amazon's cloud computing resources, 2011.

**Washington and Lee University Lenfest Grant**, awarded a stipend for 8 weeks during summer on automatically generating abstract test cases using statistical models, 2011.

**Washington and Lee University Lenfest Grant**, awarded a stipend for 4 weeks during summer on a framework for automatically seeding faults for evaluating web application testing techniques, 2010.

**Washington and Lee University Lenfest Grant**, awarded a stipend and expenses to work at the University of Delaware for 8 weeks during summer on automated test-case generation for web applications, 2009.

**Washington and Lee University Hess Fellow**, awarded to two faculty members to fund summer research, 2008. Awarded a stipend and expenses to work at the University of Delaware for 5 weeks on automated test-case generation for web applications.

## Non-Research Independent Studies

David Margolies '12: Towards a Web Interface for Ancient Inscriptions, Winter 2012.

Riley Jordan '13: Automatically Gathering Ancient Inscriptions, Fall 2011.

Si Young Kim '13: Towards a New Social Network, Winter 2011.

Ethan Smith '10: Developing Android applications using Google Maps API, Winter 2010.

Jack Ivy '11: Developing Android applications, Fall 2009.

David Vaught '09: Modeling physics in Java, Spring 2009.

## Research Experience

### IBM T.J. Watson Research Lab

Hawthorne, NY

[June – August 2002] **Co-op Pre-Professional Programmer** supervised by Dr. Khalil Amiri on the DBProxy research project. Designed and implemented consistency policies for DBProxy, an edge-of-network semantic dynamic data cache. Resulted in one journal and one workshop publication.

### IBM T.J. Watson Research Lab

Hawthorne, NY

[June – August 1999] **Co-op Pre-Professional Programmer** supervised by Dr. Mark Chu-Carroll on the Manitoba (later renamed Stellation) project. Implemented the client side of a distributed programming environment designed to coordinate programmers collaborating on large software projects. Resulted in one conference and one workshop publication.

## Industry Experience

### IBM Cambridge Lab

Cambridge, MA

[June – August 2003] **Software Engineer Intern** worked with a four-person team of Extreme Blue interns on the Mobile Moscow project. The team was responsible for designing and implementing a technical and business plan, culminating in a presentation and demonstration to IBM executives.

### IBM Tivoli

Research Triangle Park, NC

[June – August 2000] **Summer Intern** supervised by Dr. James Jennings on Tivoli Device Management team. Designed and implemented a prototype for an online front end to a Tivoli personalized services product. The new front-end primarily used Java servlet technology.

## Technical Reports

S. Sampath, E. Gibson, S. Sprenkle, and L. Pollock. "Coverage Criteria for Testing Web Applications." Technical Report 2005-017, Department of Computer and Information Sciences, University of Delaware, April 2005.

S. Sprenkle, S. Sampath, E. Gibson, A. Souter, L. Pollock. "An Empirical Comparison of Test Suite Reduction Techniques for User-session-based Testing of Web Applications," Technical Report 2005-009, Computer and Information Sciences, University of Delaware, November 2004.

J. Moore, D. Irwin, L. Grit, S. Sprenkle, and J. Chase. "Managing Mixed-Use Clusters with Cluster-on-Demand." Department of Computer Science, Duke University Technical Report, January 2003.

S. Sprenkle and J. Chase. “Scaling Java-based Dynamic Web Services.” Department of Computer Science, Duke University Technical Report CS-2001-02, May 2001.

## Professional, Institutional, Community Service

### University

**Digital Humanities Committee**, Associate Chair, 2014–2020, Member, 2013–2020. Awarded funding to develop digital humanities curriculum through the Mellon foundation and funding to develop collaboration with Scholars’ Lab at the University of Virginia through the Associated Colleges of the South (ACS) R1 Collaboration Partnership program.

**University Committee Member:** Faculty Affairs Committee (elected), 2020-2023, chair Fall 2022; University Library Committee, 2017–2020; Faculty Representative to the Board of Trustees (elected), 2015–2017; STEM Pedagogy Working Group, 2015–2016; Student Affairs Committee (elected), 2013–2014, 2015–2016; Women’s and Gender Studies Program Advisory Committee, maintainer of Web Presence, 2009–2014; Spring Term Coordinating Committee, 2012-2013; Public Functions Committee, 2011–2013; Faculty Committee on Inclusiveness, 2008–2009.

**Co-coordinator of Washington and Lee’s Women in Math and Science (WIMS) group**, 2010–2014. Awarded funding to develop joint program with the University of Richmond through the Associated Colleges of the South (ACS) Andrew W. Mellon Faculty Renewal Program. Awarded Dean Cohort Grant to support lunch workshops for WIMS faculty.

**Program Committee Member:** Women’s Leadership Summit, 2011–2012, 2013–2014.

**Phi Beta Kappa Executive Committee Member**, 2013-2014.

**Faculty Advisor:** APO (service fraternity), 2019–2022; GRAAC (Generals Raising Awareness of Animal Cruelty), 2012–2016; PLAY, 2012–2015; Pi Beta Phi Sorority, 2011–2014.

### Technical

**Conference Program Committee Member**, International Symposium on Software Testing, Verification, and Validation (ICST), 2012, 2015, 2018, 2019, 2022, 2024; IEEE International Symposium on Software Reliability Engineering (ISSRE), 2008, 2009, 2013; International Conference on Quality Software (QSIC), 2012; Testing: Academic and Industrial Conference - Practice and Research Techniques (TAIC PART), 2009.

**Technical Paper Reviewer**, ACM Student Research Competition, Grand Finals, 2015–2018; Journal of Systems and Software, 2013, 2016, 2017; Software Quality Journal, 2010, 2017; IEEE Transactions on Education, 2017; Journal on Software Testing, Verification, and Reliability (JSTVR), 2007, 2008, 2015, 2020; Transactions on Software Engineering, 2013, 2014; IEEE Transactions on Reliability, 2014; IET Software, 2013; Information and Software Technology, 2013, 2014; Science of Computer Programming, 2013; Computer, 2013; Experiences and Empirical Studies in Software Modelling (EESS-Mod), 2011; Encyclopedia of Software Engineering, 2009; International Conference on Software Engineering (ICSE), 2006, and Web Caching and Content Distribution (WCW), 2001.

**Workshop Program Committee Member**, Software Testing Education (TestEd), 2023; Gender Equity, Diversity, and Inclusion in Software Engineering (GE), 2023; Automated Software Engineering Tool Demonstration Track, 2018; International Workshop on Regression Testing, 2012; International Workshop on Testing, Analysis, and Verification of Web Software (TAV-WEB), 2010; Automated Software Testing (AST), 2010.

**Ph.D. Symposium Co-Chair**, International Symposium on Software Testing, Verification, and Validation (ICST), 2014.

**Short Papers Committee Member**, ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM), 2016.

**Student Papers Committee Member**, IEEE International Symposium on Software Reliability Engineering (ISSRE), 2013.

**Emerging Research Track Program Committee Member**, The 19th Asia-Pacific Software Engineering Conference (APSEC), 2012.

**CRA-W Distributed Research Experiences for Undergraduates (DREU) Research Mentor**, selected by committee for Summer 2009. Mentored two undergraduates.

**Conference Poster and Panel Reviewer**, Richard Tapia Conference, 2009.

**Poster Committee**, International Symposium on Empirical Software Engineering and Measurement (ESEM), 2009

### Increasing Diversity in Computing

**Workshop Co-Chair**, Second Workshop on Gender Equality in Software Engineering (GE2019), at International Conference on Software Engineering (ICSE), 2019.

**Faculty Co-Chair**, Grace Hopper Celebration of Women in Computing, 2015–2017.

**Poster Co-Chair**, Grace Hopper Celebration of Women in Computing, 2013.

**Panel and Workshop Selection Committee**, Grace Hopper Celebration of Women in Computing, 2010, 2012.

**Academic Advisory Committee**, Grace Hopper Celebration of Women in Computing, 2010, 2012.

**Panelist**, National Science Foundation (NSF) Software Hardware Foundations (SHF), 2015; National Science Foundation (NSF) Broadening Participation in Computing (BPC), 2008, 2009.

**Student Scholarship Reviewer**, Grace Hopper Celebration of Women in Computing, 2008–2013.

### Community

**Director**, Rockbridge Animal Alliance, 2014–2023. Working with a group of like-minded individuals to create a non-profit that focuses on the welfare of animals in the Rockbridge community. Awarded over \$25,000 in grants to support low-cost spay/neuter and pet food pantry.

**Web Site Consultant**, Rockbridge Area Health Center, 2018–2019. Provided technical support on Wordpress site.

**Web Site Consultant**, Rockbridge Historical Society, 2011–2020. Redesigned web site in WordPress to make it easier for any RHS member to edit the site; perform routine maintenance and upgrades. <http://rockhist.org>

**Web Site Consultant**, Rockbridge SPCA, 2013–2014. Redesigned web site in WordPress to make site easier to maintain; keep site up to date with news, events, adoptable animals, and success stories; perform routine maintenance and upgrades.

**IT Consultant**, Rockbridge SPCA, 2013. Upgraded the SPCA's computers (donated by W&L) with more recent OS and desktop applications.

**Research Group Web Presence Maintainer**, maintained the web presence of Dr. Lori Pollock's Research Group, including the digital publications library, 2004-2007.

**Organization Committees Co-Chair**, MASPLAS (Mid-Atlantic Student Workshop on Programming Languages and Systems) Organizing Committee: Public Relations, Registration Committees, 2005.

### Consultant

**Code Evaluator, Social Networks and Archival Context (SNAC)**, University of Virginia, Summer 2014. <http://socialarchive.iath.virginia.edu/> Evaluated the SNAC code (excluding the XSLT code) and documentation. Identified errors. Documented the process of installing and running the code.

### Honors and Awards

**Lauri Pfeffer Shinn Memorial Award**, awarded to one undergraduate and one graduate woman in recognition of academic success and contribution to the department by the University of Delaware Department of Computer and Information Sciences, 2006.

Department of Computer and Information Sciences **Graduate Teaching Assistant Award**, University of Delaware, 2005, a monetary award given to a Computer and Information Sciences graduate teaching assistant in recognition of teaching excellence.

**National Science Foundation Graduate Research Fellowship**, 2000–2003. Featured in the 60<sup>th</sup> anniversary retrospective.

Duke Computer Science Department **Service Award**, 2000, 2002, 2003.

**Phi Beta Kappa**, Gettysburg College, inducted in 1999.

Rev. George N. and M. Naomi Lauffer Scholarship Award, awarded to a rising junior at Gettysburg College for scholarship, character, and ability, 1997.

1996 Benjamin Fine Awards for Outstanding Education Reporting, earned as a correspondent with *The York Daily Record*, from NASSP.

### Other

Member of the Association of Computing Machinery (ACM), SIGSOFT, SIGCSE; IEEE (Senior Member), Computer Society

Citizenship: United States.

Interests: pop culture, gardening, animals

Please refer to <https://cs.wlu.edu/~sprenkle/> for additional information.