

EMILY GIBSON HILL

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Department of Computer & Information Sciences

University of Delaware · Newark, DE 19716

RESEARCH INTERESTS

Natural Language Program Analysis, software maintenance, program comprehension, automated software testing, software engineering, software engineering experiment design & data analysis.

EDUCATION

University of Delaware Newark, DE
Ph.D. in Computer Science, expected 2009. Thesis: *Developing Natural Language-based Software Analyses & Tools to Expedite Software Maintenance*. Advisors: Dr. Lori Pollock & Dr. K. Vijay-Shanker.

University of Delaware Newark, DE
Masters in Computer Science, May 2005. Advisor: Dr. Lori Pollock.

The College of New Jersey Ewing, NJ
Bachelors of Science in Computer Science, Minor in Mathematics, May 2003. Graduated Magna Cum Laude from Honors Program.

HONORS AND AWARDS

Best Paper Award. 5th Working Conference on Mining Software Repositories, 2008.

NSF Award CCF-070240. Participated in writing and discussion. PIs: Lori Pollock and K. Vijay-Shanker, *"Applying and Integrating Natural Language Processing Analysis of Programs to Aid in Software Maintenance and Evolution,"* 2007-2010.

Lauri Pfeffer Shinn Memorial Award. Given annually to one or more women CIS students in recognition of a contribution to the CIS department and academic success, 2007.

Funded Participant. 2006 Women's Institute for Summer Education at UC Berkeley's Center for the Team in Research for Ubiquitous Secure Technology (TRUST), July 2006.

NSF Graduate Research Fellowship. Full tuition and stipend, 2005-2008.

First Year Fellowship. Funding awarded by the CIS department in addition to regular stipend, 2003-2004.

Honorable Mention, Computing Research Association (CRA) Outstanding Undergraduate Award, 2003.

Charles H. Goldberg Award. Awarded annually by TCNJ CS Department for academic excellence and pursuing graduate studies in CS, 2003.

UPE Microsoft Scholarship Awards. 10 awarded nationally, funded by Microsoft, 2002-2003.

CRA-W CREW Awards. Funded Collaborative Research Experience for Women in Undergraduate CS & E, for projects *"Word Conflation Module in Question & Answering System Development"* and *"Parallel Genetic Algorithms for Weather Prediction,"* 2002-2003.

CRA-W Distributed Mentor Program. Funded summer research project, *"Modeling Web Applications for Program Analysis,"* at the University of Delaware under advisor Dr. Lori Pollock, 2002.

Computer Science Department Awards. Awarded annually by TCNJ CS faculty & funded by UPE, 2000-2003.

Honorable Mention. CCSCNE poster competition for *Web Accessibility Compliance* poster, 2002.

New Jersey Bloustein Distinguished Scholar. Scholarship awarded by the state of New Jersey, 1999-2003.

JOURNAL PUBLICATIONS

Zachary P. Fry, David Shepherd, **Emily Hill**, Lori Pollock, K. Vijay-Shanker. "Analyzing Source Code: Looking for Useful Verb-Direct Object Pairs in All the Right Places." *IET Software Special Issue on Natural Language in Software Development*, February 2008.

Sreedevi Sampath, Sara Sprenkle, **Emily Gibson**, Lori Pollock, Amie Souter Greenwald. "Applying Concept Analysis to User-session-based Testing of Web Applications." *IEEE Transactions on Software Engineering*, October 2007.

CONFERENCE PUBLICATIONS

Giriprasad Sridhara, **Emily Hill**, Lori Pollock, and K Vijay-Shanker. "Identifying Word Relations in Software: A Comparative Study of Semantic Similarity Tools." *16th IEEE International Conference on Program Comprehension*, Jun 2008. 35% acceptance rate.

Emily Hill, Zachary P. Fry, Haley Boyd, Giriprasad Sridhara, Yana Novikova, Lori Pollock, K. Vijay-Shanker. "AMAP: Automatically Mining Abbreviation Expansions in Programs to Enhance Software Maintenance Tools." *5th Working Conference on Mining Software Repositories*, May 2008. **Best Paper Award**, 40% acceptance rate.

Emily Hill, Lori Pollock, K. Vijay-Shanker. "Exploring the Neighborhood with Dora to Expedite Software Maintenance." *International Conference on Automated Software Engineering*, Nov 2007. 12% acceptance rate.

Thomas Fritz, Gail Murphy, **Emily Hill**. "Does a Programmer's Activity Indicate Knowledge of Code?" *6th Joint Meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering*, Sep 2007. 17% acceptance rate.

David Shepherd, Zachary P. Fry, **Emily Hill**, Lori Pollock, K. Vijay-Shanker. "Using Natural Language Program Analysis to Locate and Understand Action-Oriented Concerns." *International Conference on Aspect Oriented Software Development*, Mar 2007. 18% acceptance rate.

Sreedevi Sampath, Sara Sprenkle, **Emily Gibson**, Lori Pollock. "Web Application Testing with Customized Test Requirements—An Experimental Comparison Study." *International Symposium on Software Reliability Engineering*, Nov 2006. 34% acceptance rate.

Sara Sprenkle, **Emily Gibson**, Sreedevi Sampath, Lori Pollock. "Automated Replay and Failure Detection for Web Applications." *International Conference on Automated Software Engineering*, Nov 2005. 9% acceptance.

Sara Sprenkle, Sreedevi Sampath, **Emily Gibson**, Lori Pollock, Amie Souter. "An Empirical Comparison of Test Suite Reduction Techniques for User-session-based Testing of Web Applications." *International Conference on Software Maintenance*, Sep 2005. 31% acceptance rate.

David Shepherd, **Emily Gibson**, Lori Pollock. "Design and Evaluation of an Automated Aspect Mining Tool." *2004 International Conference on Software Engineering Research and Practice*, Jun 2004. 31% acceptance rate.

WORKSHOP PUBLICATIONS

Sara Sprenkle, **Emily Hill**, Lori Pollock. "Learning Effective Oracle Comparator Combinations for Web Applications." *First International Workshop on Software Test Evaluation*, Oct 2007.

Lori Pollock, K. Vijay-Shanker, David Shepherd, **Emily Hill**, Zachary P. Fry, Kishen Maloor. "Introducing Natural Language Program Analysis." *Workshop on Program Analysis for Software Tools & Engineering*, ACM, Jun 2007.

Sara Sprenkle, **Emily Gibson**, Sreedevi Sampath, Lori 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*, ACM, Jul 2006.

Sreedevi Sampath, Sara Sprenkle, **Emily Gibson**, and Lori Pollock. "Integrating Customized Test Requirements with Traditional Requirements in Web Application Testing." *Workshop on Testing, Analysis and Verification of Web Services and Applications*, ACM, Jul 2006.

Sreedevi Sampath, Sara Sprenkle, **Emily Gibson**, Lori Pollock, and Amie Souter. "Analyzing Clusters of Web Application User Sessions." Workshop on Dynamic Analysis, May 2005.

OTHER ORAL PRESENTATIONS

"Developing Natural Language-based Program Analyses & Tools to Expedite Software Maintenance." Doctoral Symposium at the *International Conference on Software Engineering*, May 2008. 25% acceptance rate.

POSTER PRESENTATIONS

E. Hill, L. Pollock, K. Vijay-Shanker. "Towards a Natural Language Program Analysis for Exploring Cross-Cutting Concerns." *International Conference on Aspect Oriented Software Development*, Mar 2007.

E. Gibson, L. Pollock. "An Approach to Providing Remote Debugging Feedback without Revealing Sensitive Information." *Grace Hopper Celebration of Women in Computing*, Oct 2006.

E. Gibson, S. Sampath, S. Sprenkle, L. Pollock, A. Souter. "A Fault Detection Framework for comparing Test Suite Reduction Techniques." *CRA-W DMP Reunion at the 2004 Grace Hopper Conference*, Oct 2004.

E. Gibson, D. Knox. "Parallel Genetic Algorithms: An Exploration of Weather Prediction through Clustered Computing." *Posters Under the Dome*, Mar 2003. Presentation to NJ State Legislatures at State Capitol, met with Senator Thomas Kean, Jr. to discuss research at state colleges.

E. Gibson, L. Pollock. "Modeling Web Applications." *SIGSOFT Foundations of Software Engineering*, Nov 2002.

E. Gibson. "Web Accessibility and Section 508 Compliance." *Journal of Computing in Small Colleges*, May 2002. Honorable Mention in poster competition.

E. Gibson, C. Grape, M. Martinovic. "Design and Development of a Word Conflation Module and its Evaluation by Integration into an Information Retrieval System." *13th Annual Saint Joseph's University Sigma Xi Student Research Symposium*, Apr 2002.

RESEARCH EXPERIENCE

Natural Language Program Analysis. Dr. Pollock & Dr. Shanker, University of Delaware, Aug 2006 – present.

Analysis of Sensitive Debugging Feedback. Dr. Pollock, University of Delaware, Sep 2005 – Aug 2006.

Automated Testing of Web Applications. Dr. Pollock, University of Delaware, Jun 2004 – Jun 2007.

Automated Aspect Mining. Dr. Pollock, University of Delaware, Fall 2003.

Modeling Web Applications for Program Analysis. Dr. Pollock, University of Delaware, May 2002 – Dec 2002.

Parallel Processing on a Linux Cluster. Dr. Knox, The College of New Jersey, Jan 2002 – May 2003.

Question & Answering System Development. Dr. Martinovic, The College of New Jersey, Jan 2001 – May 2003.

RESEARCH MENTORING

Giriprasad Sridhara, "Analyzing Comment Usage in Software for Maintenance and Quality Assessment." Ph.D. thesis, 2007 - present. Expected graduation 2011.

Haley Boyd, "Analyzing Word Usage in Software to Improve Software Maintenance Tools," Research Experience for Undergraduates, 2008 - present.

Zachary P. Fry, "Automatically Mining Abbreviation Expansions from Software." Senior Honors Thesis, 2008.

Kishen Maloor, "Investigating Latent Semantic Indexing on Software." Graduate independent study, 2007-2008.

Yana Novikova, "Integrating Information Retrieval with NLP for a Program Navigation Tool." Undergraduate independent study, 2007.

Meilani Williams, "Preposition Word Usage." CRA-W Distributed Mentor Program, Summer 2007.

TEACHING

Lecturer, University of Delaware **Spring 2005, Fall 2006**
Advanced Compiler Construction (graduate, CISC 672). Taught two different type checking lectures about reading type checking specifications and polymorphism for compiler construction.

Teaching Assistant, University of Delaware **Spring 2005**
Advanced Web Technologies (CISC 474). Created instructions for assignments and development setup for the students, graded projects and written assignments.

Teaching Assistant, University of Delaware **Fall 2004**
Introduction to Computer Science (CISC 181). Introductory C++ programming course in computer science for undergraduates with some prior programming experience. Lead lab sessions, graded assignments, contributed to lab & project assignment creation.

Instructor, University of Delaware **Summer 2004**
General Computer Science (CISC 105). Introductory C programming course in computer science for undergraduates with no prior programming experience. Ran lectures, outlined course syllabus, assigned labs, created assignments and exams.

Teaching Assistant, University of Delaware **Spring 2004**
General Computer Science (CISC 105). Introductory C programming course in computer science for undergraduates with no prior programming experience. Lead lab sessions, graded labs and projects, proctored exams.

Instructor, University of Delaware **Winter 2004**
Computer & Information Systems (CISC 101). Basic level general computer science course for non-majors. Ran lectures, outlined course syllabus, assigned labs, created assignments and exams.

INDUSTRY EXPERIENCE

Intern, Business Signatures Corporation, Redwood City, CA **June - August 2005**
Explored ways in which Formal Concept Analysis could be applied to the product, including modeling user behavior, analyzing log files, and calculating reduced test suites for performance testing web applications. Offered internship based on research in the *Automated Testing of Web Applications* project.

Intern, Visiting Student Enrichment Program, NASA Goddard Space Flight Center **June - August 2001**
Compared and contrasted a number of software tools available that test and fix Web pages for web accessibility and compliance with Section 508 under the Rehabilitation Act. Presented results in an accessible, portable format suitable for distribution.

PROFESSIONAL SERVICE

Panelist, CRA-W/CDC Systems Research Mentoring Workshop, June 2008.

Student Volunteer, International Conference on Aspect Oriented Software Development, March 2007.

Travel Award Co-Organizer. Developed and presented case study to the UD CIS Department and UD Dean of Arts and Sciences, funding 10 graduate and undergraduate women to attend the 2006 Grace Hopper Conference, October 2006.

Webmaster, 2006 International Symposium on Software Testing and Analysis (ISSTA '06), 2005–2006.

Student Volunteer, International Conference on Software Engineering, May 2005.

Organizing Committee Member & Webmaster, Mid-Atlantic Student Workshop on Programming Languages and Systems, April 2005.

Panelist, New Graduate Student Seminar on "Time Management" and "Passing the UD Preliminary PhD Examination", University of Delaware, 2004-2007.

CISTers Co-Founder, Event Coordinator, Webmaster, 2005-2007. CISTers is a group for women in technology-driven fields at the University of Delaware.

President, Computer & Information Sciences Graduate Student Association, 2005-2007; member 2003-2007.

UPE Chapter President, 2002-2003; member 2001-2003.

Vice President of Electronic Communications & Web Master, Golden Key Honor Society Chapter, 2001-2003.

OTHER

Member of the Association for Computing Machinery, 2002 – present.

Member of Schola Cantorum, large chorale group at University of Delaware.

Member of The College of New Jersey Orchestra, Chorale, and Chorus.

Founding member of The Trentones, TCNJ's first secular A cappella group.

Volunteer with Ewing SeniorNet, a non-profit organization offering computer classes and instruction for senior citizens of Ewing, 2003.

REFERENCES

Dr. Lori Pollock
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