

Mark S. Sherriff

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School of Engineering and Applied Science
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RESEARCH AREAS

Computer Science Education, Mobile Computing, Software Engineering, Software Reliability, Software Testing, Agile Software Development, Extreme Programming

TEACHING INTERESTS

Introduction to Computer Science, Mobile Systems Development, Web Systems Development, Software Engineering, Database Management Systems, Video Game Design and Production, Requirements Engineering, Software Testing and Reliability, Agile Software Development

EDUCATION

North Carolina State University, Raleigh, NC

Doctor of Philosophy, Computer Science

August 2002 – August 2007

Advisor: Dr. Laurie Williams

Topic: Analyzing Software Artifacts through Singular Value Decomposition to Guide Development Decisions

North Carolina State University, Raleigh, NC

Master of Science, Computer Science

August 2002 – May 2004

Advisor: Dr. Laurie Williams

Topic: Estimating Software Reliability in a Haskell Programming Environment

Wake Forest University, Winston-Salem, NC

Bachelor of Science, Computer Science with Honors, Cum Laude

August 1998 – May 2002

Advisor: Dr. Jennifer Burg

Honors Topic: Unix Tutorials to Move Students from PC/Windows to Unix

AWARDS

Trigon Engineering Society Thomas E. Hutchinson Faculty Award Winner 2011

Hartfield-Jefferson Scholars Teaching Prize 2010 (Engineering school-wide – first year ever awarded)

UVa ACM Computer Science Professor of the Year 2010

Trigon Engineering Society Thomas E. Hutchinson Faculty Award Finalist 2010

TEACHING

University of Virginia, Charlottesville, VA

Assistant Professor of Computer Science, Teaching Faculty

Department of Computer Science

August 2007 – Present

Responsible for the development and teaching of Computer Science courses at the University of Virginia. Serves as Chair of the Undergraduate Curriculum Committee.

Courses Taught:

CS 1110: Introduction to Computing

(6 sections: Fall 2010 – 150 students; Spring 2011 – 450 students; Fall 2011 – 230 students; Spring 2012 – 484 students)

CS 150: Computing – From Euclid and Ada to Quantum Computing and the WWW

(1 section: Spring 2008 – 65 students)

CS 201/2110: Software Development Methods
(9 sections: Fall 2007 – 108 students; Spring 2008 – 70 students; Fall 2008 (2 sections) – 152 students; Spring 2009 – 125 students; Summer 2009 – 13 students; Fall 2009 (2 sections) – 190 students; Spring 2010 – 105 students; Summer 2010 – 20 students; Summer 2011 – 24 students)

CS 340/3240: Advanced Software Development
(2 sections: Spring 2009 – 90 students; Spring 2010 – 95 students)

CS 462/4750: Database Systems
(4 sections: Fall 2007 – 44 students; Fall 2008 – 54 students; Spring 2011 – 70 students; Spring 2012 – 71 students)

CS 4501: Special Topics – Service Learning Practicum
(1 section: Spring 2012 – 12 students)

CS 4720: Web Information Systems Engineering
(3 sections: Fall 2009 – 55 students; Fall 2010 – 72 students; Fall 2011 – 83 students)

CS 4993: Independent Study
(2 sections: Fall 2010 – Game/Camera HCI – 5 students; Spring 2011 – Agile Investigations – 2 students)

All teaching evaluations available on personal website.

North Carolina State University, Raleigh, NC **Department of Computer Science**
Adjunct Summer Lecturer *Summer 2003 – Summer 2006*

Responsible for the development and teaching of a senior-level Computer Science class at NCSU.

CSC 440: Database Management Systems – Summer 2003, 2004, 2005, and 2006
10-Week Summer Course with average class size of 35

North Carolina State University, Raleigh, NC **Department of Computer Science**
Graduate Teaching Assistant *Fall 2002 – Fall 2005*

Taught several lab sections along with assisting in the development of course materials and guest lecturing. Responsible for installing and maintaining servers running SVN, Apache, JSP, and MySQL for course purposes.

Fall 2002 – Software Engineering – with Dr. Laurie Williams
Fall 2004 – Software Engineering – with Dr. Laurie Williams
Spring 2005 – Software Engineering – with Dr. Purush Iyer
Fall 2005 – Software Engineering – with Dr. Laurie Williams

North Carolina State University, Raleigh, NC **Faculty Center for Teaching and Learning**
Coursework in Teaching for College *Fall 2006 – August 2007*

Participant in program offered by the NCSU Faculty Center for Teaching and Learning to promote, develop, and reward excellence in teaching among NC State's graduate students. Took formal coursework in teaching methods and theory for college-level students.

RESEARCH

University of Virginia, Charlottesville, VA **Department of Computer Science**
Assistant Professor of Computer Science, Teaching Faculty *August 2007 – Present*

Currently performing computer science education and software engineering research.

Android/Arduino Platform for Sensor Networks

Currently, sensors placed in the field can be costly to build and even more costly to integrate, as many of them operate on different platforms. Android phones come with numerous sensors already built in (sound, camera, GPS, accelerometer, gyroscope, etc). We want to leverage the relatively-low cost of

phones along with programmable Arduino boards to create sensor networks that can quickly and efficiently deployed.

Teaching Teamwork in Engineering

As instructors, we routinely put students into project teams to simulate “real world” software development. But what sort of preparation do we give them before we actually tell them to work with others? Working with other faculty in the School of Engineering and Applied Science and Curry School of Education, we aim to investigate the most effective ways of not only teaching teamwork techniques to engineers, but also how to equip them with the skills to recognize potentially problematic team situations before they arise. Students who effectively learn how to work together could both improve their in-class grade, but also their prospects for employment in the future.

Transfer of Pair Programming to Other Disciplines

Research has shown that the use of pair programming in industry and low-level CS courses reduces the number of faults introduced into the system. Further research has discussed how the main benefit of pair programming comes mainly out of better understanding requirements and design choices. I am investigating (along with colleagues in other fields) how the concepts we teach about pair programming in CS courses might aid students with group work in other fields. Do the ideas about driver/navigator translate to other activities? If so, does it have an effect on the quality of the work produced? How can we create the “best” pair for paired activities? How can we best evaluate those pairs?

Software Engineering Courseware for Large Courses

Solutions to aid software engineering instructors with everything from source control to team management can be hard to find and configure for a given institution. What resources should we focus on in a comprehensive software engineering course to best prepare students for industrial development? A customized OS distribution with a given set of tools could aid instructors with the deployment of a software engineering course.

Senior Thesis Advisor

Fall 2007 – Present

Currently performing computer science education research related to intro CS and software engineering courses. Advise senior-level students in independent research projects.

Fall 2011 – Spring 2012

Alex Johnson and Matt Russell – Software for Non-Profit Organizations

Erik Davis – Java vs. Python in Introductory CS Courses

Harry Bowron – Open-source Software for Teaching Chemistry

Navid Hosseini, Manuel Cordovez, Katie Hempenius, and Reed Wilson – Android Platform for UGVs

Fall 2010 – Spring 2011

Jared Harding – Mobile HCI

Calvin Li and George Washington – Voice Interface for Portable Learning

Bennett Sorbo – CavDaily Advertising

Nikhita Karki – Scheduling System for Student Volunteers at UVa Hospital

Daniel Magnusson – Motion Sickness with Video Games

Kevin Leach – Prescription Databases

Michale Devine and Olex Ponomarenko – Generating Music and Art using Microsoft Kinect

Derrick Brameyer and Alan Kush – Agile Development in Student Projects (Ind. Study)

Fall 2009 – Spring 2010

Matt Beattie – Bluetooth Identification for Vehicles

Ryan Grigsy – Security for Emergency Announcement Systems

Joshua Joyner – Lego Mindstorm NXT Sensor Simulation

Seth Micalizzi – Mobile GPS Social Applications

Charles Plucker – Mobile Virtual Reality

Emma Rosenfeld – Teaching Time Concepts to Early Elementary Students

John Szmuski – Bluetooth Identification for Vehicles

Steven Trombetta – PairEval v2.0

Jessica Vasconcellos – Student timecard system for Newcomb Hall

Fall 2008 – Spring 2009

Jeffery Gaither – Web Software Source Control Management and Users
Michael Miller – An Analysis of Static Metrics in Open-Source Software Projects
Benjamin Plunkett – UVaCollab: Compliance with FERPA
Joshua Sennett – Compatibility of Partnered Students in Computer Science Education

Fall 2007 – Spring 2008

Eric Bradbury – A New Paradigm for Tutoring at the School of Engineering and Applied Science
Fred Dysart – PHP Based Automated Fix for SQL Injection Attacks
Maureen Maughn – Web-Based Kennel System in PHP and MySQL
Danny Shih – Integrated Querying in C# using Microsoft LINQ

North Carolina State University, Raleigh, NC

Graduate Research Assistant

Department of Computer Science

Fall 2002 – August 2007

Performed research under the advisement of Dr. Laurie Williams in the Laboratory for Collaborative System Development at NCSU. Also responsible for the administration and maintenance of three research servers and several group workstations.

Analyzing Software Artifacts through SVD to Guide Development Decisions

Dr. Laurie Williams, NCSU and Dr. Mike Lake, IBM

July 2006 – August 2007

During the software development process, development artifacts are created either intentionally by the developer, such as source code or design documents, or as a by-product of the process, such as source change records or defect tracking information. These by-product development artifacts contain valuable information about underlying structures in a system that may not normally be apparent. We have created the Software Development Artifact Analysis methodology for illuminating these underlying system structures using development artifacts with the singular value decomposition. These structures can provide valuable information regarding system evolution, impact analysis, and test case prioritization. We are currently working with partners at IBM to gather data for this research on industrial projects.

Utilizing Verification and Validation Certificates to Estimate Software Defect Density

Dr. Laurie Williams

July 2004 – August 2007

During the course of software development, developers will employ several different verification and validation (V&V) practices with their software. However, these efforts might not be recorded or maintained in an effective manner. We have built Defect Estimation with V&V Certificates on Programming (DevCOP), a software certificate management system. With DevCOP, developers can automatically track and maintain a persistent record of the V&V practices used during development via certificates. With this V&V information, developers and managers can better manage their V&V efforts within a system. Detailed information such as coverage of particular V&V techniques over the system or the amount of V&V performed on a single function can be provided.

Extending Extreme Programming

Dr. Laurie Williams and Dr. Mladen Vouk

August 2003 – July 2004

A collaborative research effort with Galois Connections, Inc, focused on estimating defect density in systems programmed in the Haskell language. An ASN.1 compiler system that was under development by Galois was analyzed, showing that certain metrics gathered on the system could indicate its potential defect density.

Wake Forest University, Winston-Salem, NC

Research Fellowship

Department of Computer Science

May 2001 – May 2002

The goal of this project was to create Unix tutorials for undergraduate CS students to use so that they could learn the new environment quicker. A short study showed that these tutorials were effective in this manner.

RESEARCH GRANTS / AWARDS

Showcase for NSF DUE Projects at the ACM SIGCSE Conferences, (NSF CCLI phase I grant 1053524, \$178k, 8/10 - 8/13), Aaron Bloomfield (PI) and Mark Sherriff (Co-PI). The purpose of this

grant is to disseminate information on current NSF projects on the computer science education at the annual SIGCSE conference, and to help educate potential grant applicants on the process of designing and authoring NSF grant proposals. This is intended to enhance the long-term quality and quantity of computer science education activities.

Motorola Droid Phones for Teaching Web Services, (Google University Relations, \$14k, 3/10), Mark Sherriff and Tom Horton. The purpose of this award is to introduce mobile phone technologies at various levels in the UVa CS curriculum.

REFEREED PUBLICATIONS

Sherriff, M. "Teaching Web Services and Service-Oriented Architecture using Mobile Platforms." 40th Annual Frontiers in Education (FIE) Conference, Washington DC, Oct 27-30, 2010.

Krogus, O., Horton, T., and Sherriff, M. "Role of Large Software Artifacts in Introductory Computer Science Courses." 40th Annual Frontiers in Education (FIE) Conference, Washington DC, Oct 27-30, 2010.

Lew, M., Horton, T., and Sherriff, M. "Using LEGO MINDSTORMS NXT and LEJOS in an Advanced Software Engineering Course." The 23rd Annual IEEE-CS Conference on Software Engineering Education and Training, Pittsburg, PA, Mar 9-12, 2010.

Sennett, J. and Sherriff, M. "Compatibility of Partnered Students in Computer Science Education." The 41st ACM Technical Symposium on Computer Science Education, Milwaukee, WI, Mar 10-13, 2010.

Dysart, F. and Sherriff, M. "Automated Fix Generator for SQL Injection Attacks." Student Paper. The 19th IEEE International Symposium on Software Reliability Engineering, Redmond/Seattle, WA, Nov 11-14, 2008.

Sherriff, M. and Williams, L. "Empirical Software Change Impact Analysis using Singular Value Decomposition." First International Conference on Software Testing, Verification, and Validation, Lillehammer, Norway, April 9-10, 2008.

Sherriff, M., Lake, J. M., and Williams, L. "Prioritization of Regression Tests using Singular Value Decomposition with Empirical Change Records." The 18th IEEE International Symposium on Software Reliability Engineering, Trollhättan, Sweden, Nov 5-9, 2007.

Sherriff, M., Heckman, S. S., Lake, J. M., and Williams, L. "Identifying Fault-Prone Files Using Static Analysis Alerts Through Singular Value Decomposition." 17th Annual International Conference of the IBM Center for Advanced Studies, Richmond Hill, Ontario, Oct 22-25, 2007.

Sherriff, M., Heckman, S. S., Lake, J. M., and Williams, L. "Using Groupings of Static Analysis Alerts to Identify Files Likely to Contain Field Failures." Short Paper. The 6th joint meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering, Dubrovnik, Croatia, Sept 3-7, 2007.

Sherriff, M. and Williams, L. "DevCOP: A Software Certificate Management System for Eclipse." 17th Annual International Symposium on Software Reliability Engineering, Raleigh, North Carolina, Nov 6-10, 2006. pp. 375-384.

Sherriff, M. and Williams, L. "A Method for Verification and Validation Certificate Management in Eclipse." Workshop on Software Certificate Management, Long Beach, California, Nov 8, 2005. pp. 19-22

Sherriff, M. and Williams, L. "Certification of Code During Development to Provide an Estimate of Defect Density." Fast Abstract. The 16th International Symposium on Software Reliability Engineering, Chicago, Illinois, Nov 8-11, 2005. pp. 447-448.

Sherriff, M. "Using Verification and Validation Certificates to Estimate Software Defect Density." Doctoral Symposium. Symposium on the Foundations of Software Engineering, Lisbon, Portugal, Sept 6, 2005.

Sherriff, M., Nagappan, N., Williams, L., and Vouk, M. "Early Estimation of Defect Density Using an In-Process Haskell Metrics Model." The First International Workshop on Advances In Model-Based Software Testing, co-located with the International Conference on Software Engineering, St. Louis, MO, May 15-16, 2005.

Sherriff, M. and Williams, L. "Tool Support for Estimating Software Reliability in Haskell Programs." Student Paper. The 15th International Symposium on Software Reliability Engineering, St-Malo, France, Nov 2-5, 2004. pp. 61-62.

Sherriff, M., Williams, L., and Vouk, M. "Using In-Process Metrics to Predict Defect Density in Haskell Programs." Fast Abstract. The 15th International Symposium on Software Reliability Engineering, St-Malo, France, Nov 2-5, 2004. pp. 19-20.

Burg, J., and Sherriff, M. "Unix Tutorials to Move Students from PC/Windows to Unix." ED-MEDIA 2002 Conference, June 30, 2002.

TUTORIALS

Heckman, S., Horton, T. and Sherriff, M. "Teaching Second-Level Java and Software Engineering with Android." 24th IEEE Conference on Software Engineering Education and Training 2010, Honolulu, Hawaii, May 2011.

INVITED PRESENTATIONS

Sherriff, M. "The Battle for Your Entertainment – The Internet, SOPA, and Censorship." The Jefferson Literary and Debating Society, University of Virginia, February 3, 2012.

Sherriff, M. "Encryption Chase – Assignment for CS2." Nifty Assignments Panel, SIGCSE 2010, Milwaukee, Wisconsin, March 2010.

Sherriff, M. "DevCOP – A Software Certificate Management System for Eclipse." Portland State University, Portland, OR, May 26, 2006.

Sherriff, M. "Defect Density Estimation Through Verification and Validation." The 6th Annual High Confidence Software and Systems Conference, Lithicum Heights, MD, April 17-19, 2006.

TECHNICAL REPORTS

Sherriff, M., Boehm, B. W., Williams, L., and Nagappan, N. "An Empirical Process for Building and Validating Software Engineering Parametric Models." NCSU Technical Report, TR-2005-45, October 19, 2005.

Nagappan, N., Sherriff, M., Williams, L. "On the Feasibility of Using Operational Profiles to Determine Software Reliability in Extreme Programming." NCSU Technical Report, TR-2003-15, August 19, 2003.

RESEARCH POSTERS

Sherriff, M., Williams, L., and Lake, M. "Utilizing Verification and Validation." Poster. Center for Advanced Computing and Communication and IBM University Days, 2006.

Sherriff, M. and Williams, L. "Utilizing Verification and Validation Certificates to Estimate Software Defect Density." Poster. Center for Advanced Computing and Communication and IBM University Days, 2005.

Sherriff, M. and Williams, L. "Estimating Software Reliability in a Haskell Programming Environment." Poster. International Conference on Functional Programming, Snowbird, UT, Sept. 19, 2004. Also IBM University Day, October 15, 2004.

OTHER WORK EXPERIENCE

Consulting, Charlottesville, VA

Software Engineer

Fall 2007 – Present

Developed web software for local companies and performed consulting on database systems. References and examples available on request.

IBM – Software Group, Research Triangle Park, NC

Software Engineer Co-op

Summer 2006 – Spring 2007

Performed research with the ABSM Architecture group in Tivoli on examining software development artifacts to guide test and identify emerging areas of risk.

PointDx, Inc., Winston-Salem, NC

Java Systems Engineer Intern

Summer 2002

Worked with the Java Development Team and Quality Assurance Team in verifying tests and revising and authoring new modules for the REX radiology reporting software.

Knowledge2Work, Winston-Salem, NC

Chief Programmer

Summer 2001 – Spring 2002

Responsible for designing and developing web sites for profit and non-profit customers as part of a student-run web design company. Member of Executive Board.

Wachovia Bank, Winston-Salem, NC

Systems Development Intern

Summer 2000

Worked in Systems Development in the Integrated Testing Support team. Implemented first team web site for other teams to use in dealing with ITS and revamped numerous JCL / COBOL programs.

Appalachia Service Project, Inc, Johnson City, TN

Computer Programmer

Summer 1999

Responsible for maintenance of computer systems in TN, VA, WV, KY. Designed, programmed, and implemented a system called Maple IX to handle mortgages for over 80 homes.

Wake Forest University, Winston-Salem, NC

Student Technology Advisor

Fall 1998-Spring 2002

Worked with numerous faculty members and departments over four years at Wake Forest University with integrating technology into the classroom and assisting professors with technology needs.

PROFESSIONAL/SERVICE ACTIVITIES _____

University/Department Service

- Chair, Undergraduate Curriculum Committee, Computer Science Department
- Member, Undergraduate Curriculum Committee, School of Engineering and Applied Science
- Member, UVa SEAS General Faculty Committee
- Member, UVa SEAS Student Affairs Committee
- Undergraduate TA Hiring Coordinator
- Advisor, Student Game Developers Club
- SEAS Orientation volunteer
- CS Department outreach to middle and high school students (Piedmont Futures program, LEAD program)

Undergraduate Advisor

- 2008-2009 – 28 Advisees (CS, BACS, First-Year SEAS)
- 2009-2010 – 42 Advisees (17 CS or BACS, 25 First-Year SEAS)
- 2010-2011 – 40 Advisees
- 2011-2012 – 32 Advisees

Organizing Committee

- Posters Chair, International Symposium on Empirical Software Engineering and Measurement, Lake Buena-Vista, FL, October 2009
- Web Chair, 19th International Symposium on Software Reliability Engineering, Redmond, WA, November 2008
- Publicity Chair, IEEE Conference on Software Engineering Education and Training, Charleston, SC, April 2008
- Webmaster, Local Arrangements, and Conference Systems Support, 17th International Symposium on Software Reliability Engineering, Raleigh, NC, November 2006

Program Committee

- Conference on Software Engineering Education and Training, Nanjing, China, Apr 17-19 2012
- 16th Annual Conference on Innovation and Technology in Computer Science Education, Haifa, Israel, July 3-5, 2012

- 42nd ACM Technical Symposium on Computer Science Education, Dallas, Texas, March 9-12, 2011
- Conference on Software Engineering Education and Training, Honolulu, Hawaii, May 22-24 2011
- IEEE International Symposium on Software Reliability Engineering, San Jose, CA, November 2010
- IEEE International Symposium on Software Reliability Engineering, Seattle/Redmond, WA, November 2008
- IEEE International Symposium on Software Reliability Engineering (Student Papers Track), Seattle/Redmond, WA, November 2008
- IEEE Conference on Software Engineering Education and Training, Charleston, SC, April 2008
- IEEE International Symposium on Software Reliability Engineering (Student Papers Track), Trollhättan, Sweden, November 2007

Conference Booth Organizer

- NSF Showcase, SIGCSE 2012, Raleigh, NC (with Prof. Aaron Bloomfield)
- NSF CCLI Showcase, SIGCSE 2011, Dallas, TX (with Prof. Aaron Bloomfield)
- NSF CCLI Showcase, SIGCSE 2010, Madison, WI (with Prof. Aaron Bloomfield)
- NSF CCLI Showcase, SIGCSE 2009, Chattanooga, TN (with Prof. Aaron Bloomfield)
- NSF CCLI Showcase, SIGCSE 2008, Portland, OR (with Prof. Aaron Bloomfield)

Conference Volunteer

- Agile Software Development Conference, Salt Lake City, UT, June 2004
- ED-MEDIA, Denver, CO, May, 2002

Conference/Journal/Grant Peer Reviewer

- Social Sciences and Humanities Research Council of Canada (SSHRC)
- NSF Panelist
- Transactions on Software Engineering
- IEEE Computer
- The Handbook of Technology Management, John Wiley & Sons, Inc.
- International Conference on Software Engineering 2007
- Asia Pacific Software Engineering Conference
- Agile Development Conference 2006
- International Symposium on Software Reliability Engineering 2005
- International Symposium on Empirical Software Engineering 2005
- Foundations of Software Engineering 2004
- International Conference on Software Engineering 2004

Professional/Honor Memberships and Awards

- Association for Computing Machinery, Member
- IEEE Computer Society, Member
- ACM SIGSOFT, Member
- ACM SIGCSE, Member
- Outstanding Teaching Assistant Award, NCSU, Spring 2006
- Upsilon Pi Epsilon Computer Science Honor Society
- Omicron Delta Kappa Leadership Honor Society
- Eta Sigma Phi Classics Honor Society

Community Service

- Grant awarded to setup broadcast studio at Mt. Energy Elementary School in Creedmoor, NC, to teach fourth and fifth grade students about digital media.
- Grant awarded to setup broadcast studio at Jackson-Via Elementary School in Charlottesville, VA, to teach students about digital media and broadcasting.

PERSONAL

Born Nov. 9, 1979 in Salisbury, North Carolina. Interests include running, video games, board games, travel, cooking, racquetball, and handbell music.