



## **Publications**

### **Journals and Conferences**

Ciera Jaspan, Michael Keeling, Larry Maccharone, Gabriel L. Zenarosa, and Mary Shaw, “Software Mythbusters Explore Formal Methods”, *IEEE Software*, vol. 26, no. 6, pp. 60-63, November/December 2009.

Ciera Jaspan and Jonathan Aldrich, “Checking Framework Interactions with Relationships”, in *Proceedings of the European Conference on Object-Oriented Programming (ECOOP '09)*, Genova, Italy, July 2009.

Ciera Jaspan, Trisha Quan, and Jonathan Aldrich, “Error Reporting Logic”, in *Proceedings of the Conference on Automated Software Engineering (ASE '08)*, L'Aquila, Italy, July 2008.

### **Symposia, Workshops, and Experience Reports**

Ciera Jaspan and Jonathan Aldrich, “Retrieving Relationships in Declarative Files”, in *Proceedings of the Workshop on Relationships and Associations in Object-Oriented Languages (RAOOL '09)*, Genova, Italy, July 2009.

Ciera Jaspan, “Checking Framework Interactions with Relationships”, in *the OOPSLA Doctoral Symposium*, Nashville, USA, October 2008. Received the ACM SIGPLAN John Vlissides Award.

Ciera Jaspan and Jonathan Aldrich, “Checking Semantic Usage of Frameworks”, in *Proceedings of the Symposium on Library Centric Software Design (LCSD '07)*, Montreal, Canada, October 2007.

Ciera Jaspan, I-Chin Chen, and Anoop Sharma, “Understanding the Value of Program Analysis Tools”, practitioner’s report in *Companion to the Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA '07 Companion)*, Montreal, Canada, October 2007.

### **Technical Reports**

Ciera Jaspan and Jonathan Aldrich, “Checking Framework Interactions with Relationships: Extended”, Institute for Software Research, Carnegie Mellon University, Technical report CMU-ISR-08-140, December 2008.

Ciera Jaspan and Jonathan Aldrich, “Checking Temporal Relations between Multiple Objects”, Institute for Software Research, Carnegie Mellon University, Technical report CMU-ISR-08-119, June 2008, originally written December 2007.

### **In Submission**

Kevin Bierhoff, Ciera Jaspan, George Fairbanks and Jonathan Aldrich, “Frameworks on the Rise”. Under submission to the International Conference on Software Engineering (ICSE 2010).

## Teaching Experience

**Pre-doctoral Lecturer**                      **Carnegie Mellon**                      **Spring 2009**

15-313, Foundations for Software Engineering

Co-taught with Dr. William Scherlis

- ◇ Gave 60% of the lectures for the course
- ◇ Redesigned instructional units on software design, software architecture, and measurement and metrics, including in-class exercises
- ◇ Added four overarching themes to the course to connect units together
- ◇ Designed and graded exam questions

**Teaching Assistant**                      **Carnegie Mellon**                      **Spring 2008**

17-654, Analysis of Software Artifacts

Dr. Jonathan Aldrich

- ◇ Assisted students in weekly office hours
- ◇ Designed and graded exam questions and several of the assignments

**Teaching Assistant**                      **Carnegie Mellon**                      **Spring 2007**

15-313, Foundations for Software Engineering

Dr. William Scherlis and Dr. Jonathan Aldrich

- ◇ Assisted with the overall curriculum for this new course offering
- ◇ Designed and graded six of the assignments for the course
- ◇ Gave half of the presentations in the weekly recitation and one lecture in class
- ◇ Designed and graded exam questions

**Teaching Assistant**                      **California Polytechnic**                      **Fall 2002 and Fall 2001**

CPE 109, Accelerated Intro to Computer Science

Dr. Clint Staley

- ◇ Assisted students in weekly office hours, both online and in-office
- ◇ Designed and graded exam questions

## Additional Educational Training

- ◇ Took Introduction to CS Education, taught by Leigh Ann Sudol. Final project was a unit on software process for undergraduate students.
- ◇ Attended several seminars with the Eberle Education Center, including Student Cognition and a lecture practice course.

## Research Projects

### Analysis of Framework Constraints

Fall 2005-Present

Ongoing work towards a Ph.D. thesis; supervised by Jonathan Aldrich.

- ◇ Created a specification language to describe framework constraints across multiple types of files, including Java and XML.
- ◇ Implemented a static analysis to analyze plugins for conformance to specified framework constraints.
- ◇ Explored the difference between three variants of the analysis: a sound variant, a complete variant, and a hybrid variant.
- ◇ Designed entire system to be adoptable and cost-effective for industry use.
- ◇ Currently validating on industry frameworks such as Spring, Eclipse, and ASP.NET.
- ◇ <http://code.google.com/p/fusion>

### Student Perceptions of Software Engineering

Summer 2009-Present

Primary investigator of the research; collaborating with Leigh Ann Sudol in CS Education.

- ◇ Designed a survey to determine undergraduate perceptions and misconceptions of software engineering.
- ◇ Giving survey to all undergraduates in computer science at Carnegie Mellon.
- ◇ Analyzing data by slicing it along many directions of interest, including work experience, particular courses taken, and other demographics.
- ◇ Results will be used to improve the software engineering curriculum at CMU

### Modern Software Frameworks

Summer 2009-Present

Member of a distributed collaboration effort with seven researchers

- ◇ Investigating the properties of modern software frameworks in several languages.
- ◇ Creating a taxonomy of frameworks to improve research in frameworks and current designs.

### Crystal Static Analysis Framework

Fall 2007-Summer 2009

Developer and lead for redesign effort on a team of four; advised by Jonathan Aldrich.

- ◇ On-going development of a pedagogical static analysis framework for Java.
- ◇ Analyses built as an Eclipse plugin and define the theoretical foundations of the analysis.
- ◇ Crystal framework builds in branch-sensitive analyses, three-address code, Java 5 annotations, concurrent analyses, and a control flow graph with exception paths.
- ◇ Supporting five research-level analyses, four of these have been published.
- ◇ Used for several years in the master's level analysis course to teach program analysis
- ◇ Ran tutorial on Crystal for educators and researchers at ECOOP 2009.
- ◇ <http://code.google.com/p/crystalsaf>

### Error Reporting Logic

Fall 2006-Spring 2008

Primary investigator of the work; co-advised undergraduate Trisha Quan with Jonathan Aldrich.

- ◇ Automatically generates human-readable error messages from failing first-order predicate logic specifications.
- ◇ Uses a heuristic to determine which object is at the cause of the error.
- ◇ Currently being used by ACMESTudio, a checker for software architecture specifications.
- ◇ <http://code.google.com/p/erl>

## Professional Experience

### Static Analysis Engineer eBay

May 2006 – Aug. 2006

Static analysis engineer for eBay Marketplaces

- ◇ Ran a cost-benefit analysis of static analysis tools, including Fortify, Klokwork, Daikon, and Fluid
- ◇ Created a process for managing static analysis tools within eBay's intricate and tightly controlled software lifecycle
- ◇ Implemented the tool management process by integrating FindBugs into the eBay development and quality assurance cycles

### Team Lead/Developer Vizolutions, Inc.

Aug. 2004 – June 2005

Team lead and developer on a content management system (CMS) for Web Associates

- ◇ Ported Web Associates's CMS from EJB to .NET
- ◇ Architected the database layer and wrote key utilities and modules on the web layer
- ◇ Created a process that allowed our 10 person team to separate core functionality from vendor specific functionality

### Program Manager

Microsoft

June 2003 – Aug. 2003

Intern Program Manager on Visual Studio Tools for Office (VSTO)

- ◇ Wrote full specifications for two new features
- ◇ Carried out a usability study, reported the data, and presented suggestions to improve VSTO
- ◇ Wrote three mini-specs for controversial features and gained team consensus on solutions

### Project Lead/Developer Vizolutions, Inc.

May 2001 – May 2003

Project lead of a Java Swing project that surveys oil wells for Applied Technology Associates

- ◇ Filtered, merged, and prioritized feature requests from three user classes
- ◇ Organized releases and decided if patches should be sent out

Developer on a Java Swing project

- ◇ Designed and implemented over 30,000 lines of safety critical code in a 100,000 line application
- ◇ Tested teammate's code through code reviews, automated test scaffolds, and black-box testing
- ◇ Received bugs from a world-wide field and debugged them using software and hardware log files

Developer on a mature MFC project

- ◇ Developed functionality that computed user-defined algebraic functions on generic data sets
- ◇ Maintained a drag and drop dialog that assisted a user in creating an oil drill-string

## Service and Societies

- ◇ Student Volunteer Chair for SPLASH 2010
- ◇ Student Volunteer Captain for OOPSLA 2009
- ◇ Co-reviewer for OOPSLA 2008, ECOOP 2007, ECOOP 2006, FOOL 2008, and PLDI 2010
- ◇ Member of the Association for Computing Machinery and SIGSOFT, SIGPLAN, and SIGCSE
- ◇ Member of Upsilon Pi Epsilon, Computer Science Honor Society
- ◇ Volunteer for Dec/5, Inc., computer science graduate student organization
- ◇ Member of the Association for Computational Heresy and SIGBOVIK

## **Additional Projects**

### **Constraints of Distributed File Systems**

**Spring 2005**

- ◇ Created a taxonomy for the environments of distributed file systems
- ◇ Classified 10 distributed file systems into the taxonomy
- ◇ Showed that many environments still exist which do not have a suitable distributed file system available
- ◇ Research completed under the supervision of Dr. Michael Haungs

### **Educational Tools Project**

**Fall 2004 – Spring 2005**

- ◇ Wrote a module that randomly generated test questions for an online testing tool for the Algorithms Analysis course
- ◇ Created and implemented an algorithm that, given a graph, would find a breadth first tree that could not have been generated by a breadth first search (non-BFS BFT)
- ◇ Created and implemented an algorithm to randomly create a graph with a particular set of parameters, including a probability that the graph contains a non-BFS BFT
- ◇ Work completed under the supervision of Dr. Clint Staley

### **Senior Project: Hold Interaction Manager**

**Fall 2003 - Spring 2004**

- ◇ Part of a three person team that created software to manage a rock climbing wall
- ◇ Evaluated three AI algorithms for creating new climbing routes with a specified difficulty level and rating the difficulty of existing climbing routes
- ◇ Implemented the AI component using a greedy bi-directional ordering algorithm and a k-nearest neighbor algorithm
- ◇ Wrote the user interface in Swing and worked with a MySQL backend
- ◇ Work completed under the supervision of Dr. Gene Fisher

### **Upper Division Software Engineering Series**

**Fall 2002 – Spring 2003**

- ◇ Worked on a year long project for Brocade to test their Common Information Object Model Manager implementation
- ◇ Managed four upperclassmen during the requirements phase
- ◇ Lead five lowerclassmen through development and testing
- ◇ Taught the lowerclassmen software engineering processes, tools, and design