

Zack Coker

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA 2013 – Present
PhD student in Computer Science with focus on Software Engineering
Masters Received 2017
Proposed Thesis – *Automated Identification and Repair of State-Based Directive Violations*
Expected Graduation – March 2020

Auburn University, Auburn, AL 2009 – 2013
Bachelors in Software Engineering with Honors
Summa Cum Laude, Presidential Scholar, 4.0 GPA

RESEARCH AND WORK EXPERIENCE

Carnegie Mellon University, Pittsburgh, PA 2013 – Present
Graduate Research Assistant: squaresLab (<https://squareslab.github.io/>); Advisor: Claire Le Goues
Research in software engineering, with a focus on Android API debugging and automated program repair, though the application of program analysis, human computer interaction, and artificial intelligence techniques.

ABB Corporate Research, Raleigh, NC May – August 2016
Software Engineering Data Analyst; Supervisor: David Shepherd
Analyzed integrated development environment (IDE) logs with data science techniques to improve the product and understand users.

Boeing, Bellevue, WA May – August 2014
Security Researcher; Supervisor: Michael Maass
Investigated open source applications with static and dynamic analysis techniques to understand how they interact with the Java sandbox. In the process, I developed a prototype security tool to strengthen the Java sandbox.

Auburn University, Auburn, AL 2012 – 2013
Undergraduate Research Assistant; Advisor: Munawar Hafiz
Developed a C program transformation tool in Eclipse to add integer overflow security to vulnerable programs.

Eglin Air Force Base Munitions Research Laboratory, Eglin, FL 2008 - 2011
Summer Engineering Apprentice; Supervisor: Jimmy Touma
Supported a missile navigation project where I performed GUI design, image processing, bit manipulation, file type conversions, and sensor calibrations. I also applied computer vision techniques along with hardware and software testing techniques.

PEER REVIEWED PUBLICATIONS

A Qualitative Study on Framework Debugging

Z. Coker, D. G. Widder, C. Le Goues, C. Bogart, and J. Sunshine

International Conference on Software Maintenance and Evolution (ICSME), 2019

Managing Uncertainty in Self-Adaptive Systems with Plan Reuse and Stochastic Search

C. Kinneer, Z. Coker, Jaicheng Wang, David Garlan, and Claire Le Goues

Software Engineering for Adaptive and Self-Managing Systems (SEAMS), 2018

Behavior Metrics for Prioritizing Investigations of Exceptions

Z. Coker, Kostadin Damevski, Claire Le Goues, Nicholas A. Kraft, David Shepherd, and Lori Pollock

International Conference on Software Maintenance and Evolution (ICSME), 2017

Analyzing the Impact of Social Attributes on Commit Integration Success

M. Soto, Z. Coker, and C. Le Goues

Mining Software Repositories (MSR), 2017

Evaluating the Flexibility of the Java Sandbox

Z. Coker, M. Maass, T. Ding, C. Le Goues, and J. Sunshine

Annual Computer Security Applications Conference (ACSAC), 2015

SASS: Self-adaptation using stochastic search

Z. Coker, D. Garlan, C. Le Goues

Symposium on Self-Adaptation and Self-Managing Systems (SEAMS), 2015

Program Transformations to Fix C Integers

Z. Coker and M. Hafiz

International Conference on Software Engineering (ICSE), 2013

Security-oriented Program Transformations to Cure Integer Overflow Vulnerabilities

Z. Coker

Systems, Programming, Languages and Applications: Software for Humanity (SPLASH), 2013

AWARDS

National Science Foundation Graduate Research Fellowship (https://www.nsfgrfp.org/general_resources/about)	2014 - 2017
First Place, ACM Undergraduate Research Competition Grand Finalist (http://src.acm.org/grand-finalists/2013)	2013
First Place, SPLASH Undergraduate Research Competition	2012
Auburn University Software Engineering Student of the Year	2012
Fred H. Pumphery Outstanding Pre-Engineering Student Award	2011

TEACHING EXPERIENCE

Teaching assistant for Introduction to Computer Systems, CMU 15-213 2018

Taught a weekly recitation, set up homework assignments, and created exam questions for a 200-student course. This course taught system basics such as virtual memory, caching, assembly, and signals to Sophomore level undergraduates.

Teaching assistant for Foundations of Software Engineering, CMU 15-313 2015

Graded, created three homework assignments, taught a weekly recitation, and taught a class lecture on open source software. This course taught software engineering problems, such as architecture, testing, and requirements gathering to Junior level undergraduates.

Mentored undergraduate researchers in research and writing

Liam Schramm, Jiacheng Wang, and David Widder – provided constructive criticism and assisted with writing multiple revisions of a research paper subsection over a period of about a month each

PAPER REVIEW EXPERIENCE

External reviewer for Journal of Computer Security

Subreviewer under Claire Le Goues's supervision – ICSE '15, ICSE '16, FSE' 17, ICSE' 18

GRANT EXPERIENCE

Evolution of Self-adaptive Systems using Stochastic Search 2015

Developed a genetic programming planner for self-adaptive systems for a class project which led to a NSF small grant.

TALKS

Evaluating the Flexibility of the Java Sandbox 2015

Annual Computer Security Applications Conference (ACSAC)

SASS: Self-adaption using stochastic search 2015

Symposium on Self-adaption and Self-Managing Systems (SEAMS)

Security-oriented Program Transformations to Cure Integer Overflow Vulnerabilities 2012

Systems, Programming, Languages and Applications: Software for Humanity (SPLASH)

LEADERSHIP

Vice President of Oakland Toastmasters Club (local Pittsburgh club) 2019

Student organizer for the CMU computer science PhD student Introduction event (two weeks of activities) where I organized social events and directed other student volunteers 2016

SKILLS

Proficient with: Python, Coffescript, Java, C, C++, Bash, MATLAB, Eclipse, Windows, Macintosh, Mercurial, Vim, Linux

Familiar with: C, C++, OCaml, PHP, Perl, Common List, Haskell, Android, SQL, Qt, Robotic Operating System (ROS), Web-development, Emacs

Online coursework:

Coursera (audited) - Designing, Running and Analyzing Experiments, Information Design, Human Centered Design, Design Principles: an Introduction, Social Computing, Input and Interaction (audited), Experience: Research & Prototyping (audited)

Udacity (audited) - Full Stack Foundations, Authentication and Authorization, Intro to HTML and CSS, Intro to Relational Databases, Intro to the Design of Everyday Things, How to Build a Startup

VOLUNTEERING

Student Volunteer (ICSE 2013, SPLASH 2015)

GRADUATE COURSES

Machine Learning

Distributed Systems

Graduate Algorithms

Programming Language Semantics

Software Engineering Research

Formal Models

Program Analysis (audited)

LOCAL COURSES AND HOBBIES

Toastmasters – Vice President of Education; Completed Level One

Steel City Improv Theater – Level One: Foundations of Improv

Pittsburgh Center for the Arts – Introduction to Drawing

Hobbies: Weightlifting, Reading (about 30 books per year), Entrepreneurship, Stock investing, Salsa dancing, Board games, Tennis