Shawn Meier

Curriculum Vitae

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Education

Ph.D. student	**University of Colorado at Boulder**, Computer Science Advisor: Prof. Bor-Yuh Evan Chang	2014 – present
Master of Science	**University of Colorado at Boulder**, Computer Science	2014 – 2016
BS	**Colorado School of Mines**, Geophysical Engineering	2009

Research Interests

I am interested in program analysis, verification, and synthesis techniques which aid in the development of correct software. Specifically I am interested in event driven software such as Android. My current research direction is automatic synthesis of framework models for Android. A good model improves the speed, correctness, and precision of program analysis on Android applications.

Current Research Projects

Verivita: Dynamic Lifestate Verification of Event-Driven Apps (Main Ph.D. Thesis Topic)
This project creates a practical method of verifying Android applications for defects relating to misuse of the Android API. Traditional techniques have difficulty reasoning about the complex underlying framework which invokes callbacks in response to external events. This project addresses these problems with a novel method of modeling the Android framework with Lifestate rules.

(with Bor-Yuh Evan Chang and Sergio Mover)

Fixr: Mining and Understanding Bug Fixes to Address Application-Framework Protocol Defects
The Fixr project is a part of the DARPA program Mining and Understanding Software Defects (MUSE). The goal of this project is to utilize bugs and fixes in the large amounts of available open source code to detect and repair software defects. `http://plv.colorado.edu/projects/fixr/`

(with Bor-Yuh Evan Chang, Pavol Cerny, Sergio Mover, Sriram Sankaranarayanan, Kenneth M. Anderson, and Tom Yeh)

DroidStar: callback typestates for Android classes The precise behavior of callbacks for an Android class is complex and depends on both methods invoked and asynchronous behavior. In this project we automatically learn an automata of callbacks and methods that may be invoked which we call a "callback typestate". This is accomplished with a modified version of the L* algorithm.

(with Arjun Radhakrishna, Nicholas V. Lewchenko, Sergio Mover, Krishna Chaitanya Sripada, Damien Zufferey, Bor-Yuh Evan Chang and Pavol Cerny)

Refereed Publications

Shawn Meier, Sergio Mover, and Bor-Yuh Evan Chang. Lifestate: Event-Driven Protocols and Callback Control Flow. (ECOOP 2019)

Arjun Radhakrishna, Nicholas Lewchenko, **Shawn Meier**, Sergio Mover, Krishna Chaitanya Sripada, Damien Zufferey, Bor-Yuh Evan Chang, and Pavol Černý. Starling: Callback Typestates for Android Classes (ICSE 2018)

Technical Reports

Shawn Meier, Aleksandar Chakarov, Maxwell Russek, Sergio Mover, Bor-Yuh Evan Chang Abstracting Event-Driven Systems with Lifestate Rules. Technical Report CU-CS-1093-12, Dec 2016.

Experience

University of ColoradoBoulder, CO December 2019 - Present
Teaching Assistant - Principles of Programming Languages Assisted in teaching a course about implementing program interpreters, functional programming, and programming languages theory.

University of Colorado (Boulder, CO) May 2019 - December 2019
Graduate Research Assistant - Fixr Project
Assisted in research to be able to utilize information from open source software to automatically detect and repair Android software defects. (Program Analysis, Machine Learning, Amazon Web Services (AWS), Java, Scala, Python)

Google (Sunnyvale, CA) May 2019 - August 2019
Deep Dive Intern Designed and implemented static analysis to detect health issues and security vulnerabilities in Android applications

University of Colorado (Boulder, CO) 2014 - May 2019
Graduate Research Assistant - Fixr Project

Trimble (Broomfield, CO) 2014
Software Engineering Intern Automatic deployment of integration testing for web services written in C# and Power Shell using Amazon Web Services.

University of Colorado (Boulder, CO) January 2014 - May 2014
Principles of Programming Languages Learning Assistant Teaching students concepts underlying programming languages through implementation of a JavaScript interpreter. This includes judgment forms, context free grammars, Scala implementation, and Functional Programming.

Level 3 Communications (Broomfield, CO) 2013
Software Engineering Intern Developed RESTful services for business logic in Java. This including trouble ticketing, CDN, and other API functions.

GeosHelix LLC (Boulder, CO) 2012
Contractor/Owner Worked on a variety of projects. Simulation of thermal oil recovery, finite element analysis, SolidWorks design, transportation system design, and teaching software development in Java, Python, and C.

Aleph Objects (Loveland, CO) 2012
Contractor Researched and constructed open source 3d printers.

Neva Ridge Technologies (Boulder, CO) June 2009 - July 2011
Research Scientist Wrote signal processing software for synthetic aperture radar in C, Java, and Matlab.

Professional Service

Conference reviewing:

Static Analysis Symposium (SAS) 2016

Asian Symposium on Programming Languages and Systems (APLAS) 2016

Journal reviewing: Formal Methods in System Design 2017

Awards and Honors

Golden Key Honors Society December 2015
University of Colorado, Boulder

Citizenship

United States of America