

The 2015 IEEE International Conference on Software Quality, Reliability and Security

QRS 2015

Vancouver, Canada, August 3-August 5, 2015

<http://paris.utdallas.edu/qrs15>

Tutorial

Modern Web Applications' Reliability Engineering

Karthik Pattabiraman

Department of Electrical and Computer Engineering

The University of British Columbia

<http://blogs.ubc.ca/karthik>

Abstract

JavaScript is today the de-facto client-side programming language for modern web applications, and is extensively used in the client-side of web applications for interactivity and faster load times. For example, 97 of the top 100 Alexa websites use JavaScript code, often running into thousands of lines of code. However, JavaScript is notorious for its difficult-to-analyze constructs and “laissez-faire” programming style, which makes it challenging to build reliable web applications in JavaScript. This tutorial will present approaches to assess and improve the reliability of modern JavaScript-based web applications.

In the first part of the tutorial, we will present empirical studies on the reliability of modern web applications, through field data studies, bug databases and online fora such as StackOverflow. We will then proceed to explore automated tools and techniques for web applications' testing, understanding and fault mitigation (i.e., repair). Finally, we will conclude with some tools for building robust client-side web applications, and discuss open issues and research problems.

About the presenter

Karthik Pattabiraman is an assistant professor in the Electrical and Computer Engineering (ECE) department at the University of British Columbia (UBC). Karthik received his M.S. and PhD degrees from the University of Illinois at Urbana Champaign (UIUC). Karthik has been a post-doctoral researcher at Microsoft Research (MSR), Redmond. He was awarded the William Carter award for best student paper in DSN 2008, the best paper runner up award at ICST 2013, and the SIGSOFT distinguished paper award at ICSE 2014. He was recently general chair for IEEE Pacific Rim International Symposium on Dependable Computing (PRDC), 2013. Karthik's research spans the areas of web applications' reliability, software fault tolerance for hardware faults and security. Along with his students and colleagues, he was the first to study the reliability of modern web applications written in JavaScript and propose techniques for improving their reliability. He has also worked extensively in the areas of testing, understanding and mitigating faults in modern web applications. His publications in this area have appeared in prestigious international conferences such as ISSRE, ICSE, ICST, ESEM, MSR, and AST. The tutorial will draw upon these papers, but will focus on their applicability to real-world problems.