



## Seminar/Talk

# Analysis and Synthesis of Floating-Point Routines

**Zvonimir Rakamaric**

University of Utah

Host: Tom Henzinger

Virtually all real-valued computations are carried out using floating-point data types and operations. With the current emphasis of system development often being on computational efficiency, developers as well as compilers are increasingly attempting to optimize floating-point routines. Reasoning about the correctness of these optimizations is complicated, and requires error analysis procedures with different characteristics and trade-offs. In my talk, I will motivate the need for such analyses. Then, I will present both a dynamic and a rigorous static analysis we developed for estimating errors of floating-point routines. Finally, I will describe how we extended our rigorous static analysis into a procedure for mixed-precision tuning of floating-point routines.

### Short bio:

Zvonimir Rakamaric is an assistant professor in the School of Computing at the University of Utah. Prior to this, he was a postdoctoral fellow at Carnegie Mellon University in Silicon Valley, where he worked closely with researchers from the Robust Software Engineering Group at NASA Ames Research Center to improve the coverage of testing of NASA's flight critical systems. Zvonimir received his bachelor's degree in Computer Science from the University of Zagreb, Croatia; he obtained his M.Sc. and Ph.D. from the Department of Computer Science at the University of British Columbia, Canada.

Zvonimir's research mission is to improve the reliability and resilience of complex software systems by empowering developers with practical tools and techniques for analysis of their artifacts. He is a recipient of the NSF CAREER Award 2016, Microsoft Research Software Engineering Innovation Foundation (SEIF) Award 2012, Microsoft Research Graduate Fellowship 2008-2010, Silver Medal in the ACM Student Research Competition at the 32nd International Conference on Software Engineering (ICSE) 2010, and the Outstanding Student Paper Award at the 13th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2007.

For more information about Zvonimir, visit [www.zvonimir.info](http://www.zvonimir.info).

**Tuesday, June 6, 2017 05:00pm - 06:00pm**

Mondi Seminar Room 2, Central Building

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