



ISR Research Forum

Where Research Meets the Real World

Friday June 8, 2018

9:00 am – 5:30 pm

University of California, Irvine ♦ 6011 Donald Bren Hall

Welcome!

9:00 – 9:10

Welcome

Cristina Videira Lopes, ISR Interim Director and Professor, UC Irvine

9:10 – 10:10

Keynote I

Session Chair: Prof. Cristina Videira Lopes, Interim Director



Bringing ML to the Developer

Dr. Satish Chandra

Software Engineer

Facebook

10:10 – 10:40

Break

10:40 – 12:00

Presentations I

Session Chair: James A. Jones, Associate Professor, UC Irvine

What Makes Expert Software Designers Successful? Examples and Insights from Practice

André van der Hoek, Professor and Informatics Dept. Chair, UC Irvine

Revisiting Expertise

David Redmiles, Professor, UC Irvine

A Large-Scale Empirical Study on the Effects of Code Obfuscations on Android Apps and Anti-Malware Products

Dr. Joshua Garcia, Associate Project Scientist, UC Irvine

On Software and Buildings

Cristina Videira Lopes, ISR Interim Director and Professor, UC Irvine

12:00 – 1:45 pm

Open House + Lunch

Lunch – served in DBH 6011 foyer at 12:00 pm. Eat at location of your choice.

Open House – begins at 12:30. See posters and demos! Located on Fifth floor: 5011 and foyer.

2:00 – 3:00

Keynote II

Session Chair: Prof. Cristina Videira Lopes, Interim Director



Google Autocomplete

Dr. Sara Javanmardi

Staff Software Engineer

Google

3:00 – 3:15

Short Break

3:15 – 4:15

Presentations II

Session Chair: Sameer Patil, Assistant Professor, Indiana University–Bloomington

The Third Wave? Inclusive Privacy and Security

Yang Wang Assistant Professor, Syracuse University

CDSChecker: Checking Concurrent Data Structures Written with C/C++ Atomics

Brian Demsky, Professor, UC Irvine

Missteps in Framework Design: Consequences and Solutions

Sam Malek, Associate Professor, UC Irvine

4:15 – 5:30 pm

Reception

Keynote I



Bringing ML to the Developer

Satish Chandra

Software Engineer

Facebook Research

ABSTRACT. While machine learning has the potential to fundamentally improve how software is constructed, opportunities to leverage machine learning to improve conventional developer tools (languages, compilers, and IDEs for example) have gone untapped in practice. At Facebook, our developer infrastructure team is on a mission to rethink and retool Facebook's developer toolchain by applying machine learning at every layer in our stack. Our goal is to make our developers more productive, and our processes and infrastructure more efficient, by integrating ML into our programming languages and developer tools, including IDEs, version control, or continuous integration systems, in novel ways. This talk will describe some of the work our team has been doing to improve developer efficiency and resource utilization at Facebook. I'll also touch upon future opportunities we see to optimize or auto-tune other common pieces of developer infrastructure.

BIO. Satish Chandra obtained a PhD from the University of Wisconsin-Madison in 1997, and a B.Tech from the Indian Institute of Technology-Kanpur in 1991, both in computer science. From 1997 to 2002, he was a member of technical staff at Bell Laboratories, where his research focused on program analysis, domain-specific languages, and data-communication protocols. From 2002 to 2013, he was a research staff member at IBM Research, where his research focused on bug finding and verification, software synthesis, and test automation. His work on bug finding shipped in IBM's Java static analysis product, and his work on test automation was adopted in IBM's testing services offering. From 2013 to 2016, he worked at Samsung Research America, where he led the advanced programming tools research team. His work on memory profiling of web apps was included in Samsung's Tizen IDE. In 2016, he started working at Facebook where he works on program analysis and on applications of machine learning to developer tools. He is an ACM Distinguished Scientist.

Keynote II



Google Autocomplete

Sara Javanmardi

Staff Software Engineer

Google

ABSTRACT. Autocomplete is one of the most heavily used features in Google Search. This feature is provided for many products such as Web, Youtube, Image, or Google Play. This talk will summarize Google Autocomplete from many perspectives such as data modeling and infrastructure behind it. It also covers interesting features and challenges.

BIO. Sara Javanmardi is a PhD graduate of UC Irvine who currently works as a Staff Software Engineer at Google Search. Before Google she worked as an engineer in Microsoft Bing on search ranking. As of now she works on the autocomplete feature that helps users search faster to find the information they need. She works on many services such as Web, Youtube and Play; she leads many projects from quality (e.g, ranking) to infrastructure (e.g, faster data pipeline). Recently her main focus is on improving spam detection and building a more robust data model.

Prof. Nikil Dutt's Research Group

Prof. Dutt's research group has various efforts in the area of embedded systems and computer-aided design, with a specific focus on the exploration, evaluation and design of domain-specific embedded systems spanning both software and hardware.

- *SPECTR: Formal Supervisory Control and Coordination for Many-core Systems Resource Management*
Amir M. Rahmani, Bryan Donyanavard, Tiago Műch, Kasra Moazzemi, Axel Jantsch, Onur Mutlu, and Nikil Dutt

Prof. James A. Jones – Spider Lab: Software Analysis and Visualization for Debugging, Comprehension, and Maintenance

The Spider Lab creates techniques for offering automatic recommendations for common software maintenance tasks.

- *SpiderSilk: A Test Framework for Distributed Systems with Environmental Failure Injection*
Armin Balalaie and James A. Jones
- *Phase Detection to Assist Software Comprehension*
Kaj Dreef, Yang Feng, and James A. Jones
- *Software Behavior Classification with Multi-label and Problem Transformation Techniques*
Yang Feng and James A. Jones



Prof. Alfred Kobsa – Personalization and Privacy Lab

The personalization and privacy lab conducts research on tailoring human-computer interaction to the needs of each individual user, and on reconciling the benefits that personalization provides with the privacy concerns that it evokes.

- *Cross-Cultural Privacy Prediction*
Yao Li, Alfred Kobsa, Bart P. Knijnenburg (Clemson University), and M-H. Carolyn Nguyen (Microsoft Corporation)

Prof. Cristina Videira Lopes – The Mondego Group

The Mondego group conducts research in large systems and large data.

- *Git, but for Objects*
Rohan Achar and Cristina Lopes
- *Testing Non-Functional Properties of Distributed Systems*
Eugenia Gabrielova and Cristina V. Lopes
- *50K-C: A dataset of compilable, and compiled, Java projects*
Pedro Martins, Cristina Lopes, and Rohan Achar
- *Oreo: Detection of Clones in the Twilight Zone*
Vaibhav Saini, Farima FarmahiniFarahani, Yadong Lu, Pierre Baldi, and Cristina Lopes
- *Sybil-Proof Contests for Strategic Diffusion in Social Networks*
Wen Shen, Yang Feng, Ke Yan (China Jiliang University), and Cristina V. Lopes
- *An Empirical Study of Dependency among Open-source Java Projects in GitHub*
Maruf Zaber and Cristina Lopes
- *Analyzing Adaptations of Stack Overflow examples using GitHub*
Tianyi Zhang* (UCLA), Di Yang*, Cristina Lopes, and Miryung Kim (UCLA) (*The two lead authors contribute equally to the work.)



Prof. Sam Malek – Software Engineering and Analysis Lab (SEAL)

The Software Engineering and Analysis Lab (SEAL) is broadly engaged in research to automate the software engineering activities, thereby improving the developer productivity as well as the quality of the resulting software.

- *A Large-Scale Empirical Study on the Effects of Code Obfuscations on Android Apps and Anti-Malware Products*
Mahmoud Hammad, Joshua Garcia, and Sam Malek
- *Nemo: Multi-Criteria Test-Suite Minimization with Integer Nonlinear Programming*
Jun-Wei Lin, Reyhaneh Jabbarvand, Joshua Garcia, and Sam Malek
- *A Temporal Permission Analysis and Enforcement Framework for Android*
Alireza Sadeghi (Google), Reyhaneh Jabbarvand, Negar Ghorbani, Hamid Bagheri (University of Nebraska-Lincoln), and Sam Malek
- *FAlloy: Modeling with Uncertainty in Alloy by using Fuzzy Logic*
Navid Salehnamadi, Hamid Bagheri (University of Nebraska-Lincoln), and Sam Malek



Prof. Gloria Mark's Research Group

Prof. Mark's group studies what is known as social computing: studying how individuals, groups, society and technology mutually influence each other. They are particularly interested in studying how information technology use affects multi-tasking, attention, mood, and above all, stress.

- *The Effect of Virtual Agents' Characteristics on User Impressions and Language Use*
Fatema Akbar, Ted Grover, Gloria Mark, and Michelle X. Zhou (Juji, Inc.). Presented by Krithika Jagannath.

Prof. Nenad Medvidović – Software Architecture Research Group (SoftArch), University of Southern California

Prof. Medvidović's Software Architecture Research Group (SoftArch) at USC focuses on architectural modeling and analysis, component-based development, architecture-based development for distributed, heterogeneous, and resource constrained devices, architecture-based self-adaptation, and event-based middleware technologies.

Software Architecture
Research Group

- *An Empirical Study of Architectural Decay*
Duc Le, Daniel Link, Arman Shahbazian, and Nenad Medvidović

Prof. Bonnie Nardi's Research Group

Prof. Nardi's group studies technology and social change.

- *Addressing Limits through Tracking Food*
Meena Devii Muralikumar and Bonnie Nardi

Prof. Sameer Patil's Research Group, Indiana University–Bloomington

Prof. Patil's research focuses on usable privacy and security, human computer interaction, and social computing.

- *What Makes People Click the Link?: Studying Emotional Appeals in Cyberattacks*
Sameer Patil, Tzipora Halevi, Nasir Memon, and Oded Nov

Prof. David Redmiles – Collaboration Research in Action, Design, and Learning Laboratory (CRADL)

The Collaboration Research in Action, Design, and Learning Laboratory (CRADL) employs an interdisciplinary approach to research phenomena in human collaborative activity. We primarily study collaborative work, and, particularly, software engineering.



- *Providing an Auditory Overview of Web Pages for Screen Reader Users*
Tao Wang and David F. Redmiles
- *Patterns of Difficulties Related to Learning to Program*
Yorah Bosse (University of São Paulo, Brazil), David Redmiles, and Marco Gerosa (Northern Arizona University and University of São Paulo, Brazil)
- *Expertise Location in Software Engineering*
Zhendong Wang, Yi Wang (Rochester Institute of Technology), and David F. Redmiles

Prof. André van der Hoek – Software Design and Collaboration Laboratory

The Software Design and Collaboration Laboratory focuses on understanding and advancing the roles of design, collaboration, and education in software development.

SDCL

- *Toward Collecting and Delivering Knowledge for Software Design at the Whiteboard*
Adriana Meza and André van der Hoek
- *Chatbots in Software Engineering*
Elahe Paikari and André van der Hoek