

## Baishakhi Ray

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### Research Interest

I am primarily interested in Software Engineering, in particular, analyzing large scale software to understand current software engineering practices. Based on this understanding, I develop novel program analysis techniques to make software more reliable and secure.

### Education

**Ph. D., Electrical & Computer Engineering, University of Texas, Austin.**  
August 2013 (GPA: 3.97)  
Thesis: Analysis of Cross-System Porting and Porting Errors in Software Projects  
Advisor: Prof. Miryung Kim

**MS, Computer Science, University of Colorado, Boulder.**  
May 2009 (GPA: 4.0)  
Thesis: SecureWear: Securing Wearable Mobile Social Networks  
Advisor: Prof. Richard Han

**B.Tech. & B.Sc., Computer Science & Physics, Calcutta University,**  
2004 (GPA: 3.84, Top 1% in University)

### Honors

- Best Practical Paper Award, IEEE Symposium on Security and Privacy 2014
- Google Summer of Code 2012  
(mentors: Dr. Suzette Person & Dr. Neha Rungta, NASA)
- SIGSOFT FSE 2012 CAPS travel award
- Jawaharlal Nehru Summer Scholarship for Advanced Research, India 2001.

### Selected Publications

#### Full Length Research Papers

- *Using Frankencerts for Automated Adversarial Testing of Certificate Validation in SSL/TLS Implementations.* C. Brubaker, S. Jana, **B. Ray**, S. Khurshid, and V. Shmatikov  
In 35<sup>th</sup> IEEE Symposium on Security and Privacy, MAY, 2014 (S&P (Oakland) '14).  
**Best Practical Paper Award**

- *Detecting and Characterizing Semantic Inconsistencies in Ported Code*. **B. Ray**, M. Kim, S. Person, N. Rungta. In 28<sup>th</sup> IEEE/ACM International Conference on Automated Software Engineering, November, 2013 (ASE'13). **Nominated for Distinguished Paper award.**
- *An Empirical Study of API Stability and Adoption in the Android Ecosystem*. T. McDonnell, **B. Ray**, M. Kim. In 29<sup>th</sup> IEEE International Conference on Software Maintenance, April, 2013 (ICSM'13).
- *A Case Study of Cross-System Porting in Forked Projects*. **B. Ray**, M. Kim. In ACM SIGSOFT, the 20<sup>th</sup> International Symposium on the Foundations of Software Engineering (FSE'12).
- *An Empirical Study of Supplementary Bug Fixes*. J. Park, M. Kim, **B. Ray**, D. Bae. In The 9<sup>th</sup> IEEE Working Conference on Mining Software Repositories (MSR'12). **Invited to the Special Issue of Journal of Empirical Software Engineering (EMSE).**
- *PTask: Operating System Abstractions To Manage GPUs as Compute Devices*. C.J. Rossbach, J. Currey, M. Silberstein, **B. Ray**, E. Witchel. In Proceedings of the 23<sup>rd</sup> ACM Symposium on Operating System Principles (SOSP'11).
- *A Protocol for Building Secure and Reliable Covert Channel*. **B. Ray** and S. Mishra. In 6<sup>th</sup> Annual Conference on Privacy, Security and Trust, 2008. (PST'08).
- *WhozThat?: Evolving an Ecosystem for Context-Aware Mobile Social Networks*. A. Beach, **B. Ray**, et al., In IEEE Network Magazine Special Issue on Composable context aware services, 2008.
- *SecureWear: A Framework for Securing Mobile Social Networks*. **B. Ray**, R. Han. In Advances in Computer Science and Information Technology. Computer Science and Engineering, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, 2012.

#### Under Submission

- *A Large Scale Study of Programming Languages and Code Quality in Github*. **B. Ray**, D. Posnett, V. Filkov, P. T. Devanbu
- *The Uniqueness of Changes: Characteristics and Applications*. **B. Ray**, M. Nagappan, C. Bird, N. Nagappan, T. Zimmermann.

#### Short Papers

- *Repertoire: A Cross-System Porting Analysis Tool for Forked Software Projects*. **B. Ray**, C. Wiley, M. Kim. In ACM SIGSOFT the 20<sup>th</sup> International Symposium on the Foundations of Software Engineering, Formal Research Tool Demonstration (FSE'12).
- *Touch Me wE@r: Getting Physical with Social Networks*, A. Beach, **Baishakhi Ray**, L. Buechley. In 2009 Workshop on Sensor-based Models and Feedback Systems for Social Computing. associated with SocialCom 2009.

## Teaching Experience

**Mentoring:** Tyler McDonnell, Connie Nguyen

**Guest Lecturer:** Software Engineering and Design Laboratory (Fall'13), UT Austin  
Software Engineering (Fall'13), UC Davis.

**Teaching Assistant:** Mobile Computing (Fall'10), UT Austin.

**Grader:** Operating Systems (Spring'08), Networking (Fall'08), UC Boulder.

## Research Internship

**Microsoft Research, Redmond, USA**

May 2013–August 2013

Mentors: Christian Bird, Nachiappan Nagappan, Thomas Zimmermann

We studied how uniquely developers change code by statically analyzing source code of two large Microsoft projects. Leveraging this understanding, we implemented a change recommendation system and a bug prediction tool. Findings of this work is currently under submission.

**Google Summer Code, Google Inc.**

*May 2012 – August 2012*

Mentors: Suzette Person, Neha Rungta, NASA

We implemented a tool, called SPA, that automatically detects and characterizes porting errors that developers often introduce while copying code from one place to another. Findings of this research is published in ASE 2013.

## Professional Experience

University of California Davis, CA, USA

Postdoctoral Research Fellow

October 2013 - present

The University of Texas at Austin, TX, USA

Research Assistant

January 2011–May 2013

Ericsson Pvt. Ltd., Boulder, CO, USA

Software Engineer

Feb 2009–June 2010

Avaya Research Lab, Westminster, CO, USA

Summer Intern

May 2008 – Aug 2008

Ixia Technologies Pvt. Ltd., India

Software Engineer

Oct 2005–July 2007

Texas Instruments & Sasken, India

Software Engineer

Aug 2004 – Oct 2005

## **Professional Services**

Program Committee: FSE Artifact '14, ISEC '14, OOPSLA Artifact '13

Reviewer: Transactions on Software Engineering (TSE), CSI Journal Computer Standards & Interfaces

External Reviewer: ASE '14, MSR '12, OOPSLA '12

Vice President, Graduate Women in Engineering, ECE Department, UT Austin

## **References**

Prof. Miryung Kim, [miryung@ece.utexas.edu](mailto:miryung@ece.utexas.edu)

Prof. Premkumar T. Devanbu, [devanbu@cs.ucdavis.edu](mailto:devanbu@cs.ucdavis.edu)

Prof. Sarfraz Khurshid, [khurshid@ece.utexas.edu](mailto:khurshid@ece.utexas.edu)

Dr. Thomas Zimmermann, [tzimmer@microsoft.com](mailto:tzimmer@microsoft.com)