

Dr.-Ing. Abhishek Tiwari

ANDROID SECURITY · STATIC ANALYSIS

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"Discipline is the key to human progress"

Education

University of Potsdam

PHD, SUPERVISOR - PROF. DR.-ING., CHRISTIAN HAMMER (GRADE: SUMMA CUM LAUDE (PROPOSED))

- Thesis Title: Enhancing Users' Privacy on Android: Static Resolution of the Dynamic Properties of Android

Potsdam, Germany

Apr. 2016 - Jun. 2019

Saarland University

MASTER OF SCIENCE IN COMPUTER SCIENCE (ECTS: 1.8)

- Thesis Title: A Formal Logic Framework for the Automation of the Right to be Forgotten

Saarland, Germany

Apr. 2014 - Jan. 2016

SASTRA University

B. TECH. IN INFORMATION TECHNOLOGY (CGPA: 8.5 \approx ECTS: 1.9)

- Thesis Title: Image Encryption Using Advanced Hill Cipher

Tamil Nadu, India

Jul. 2006 - Jun. 2010

Experience

Software Engineering Group, University of Potsdam

RESEARCH FELLOW

- Developed novel frameworks to enhance users' privacy on Android operating system.
- Successfully completed two third-party funded projects.
- Supervised multiple theses. Teaching assistant for various courses related to Information flow control.

Potsdam, Germany

Apr. 2016 - Present

Aricent Group

SENIOR SOFTWARE ENGINEER

- Performed device driver porting on Nokia Solutions and Networks (NSN)'s proprietary FSMR2 hardware.
- Solved real time customer problems (pronto)
- Won the best performer award.

Gurgaon, India

Feb. 2013 - Jan. 2014

Samsung Software Engineering Lab

ENGINEER

- Board bring up for various mobile devices on Samsung's multimedia mobile platform.
- Optimized memory map for various low end mobile devices.
- Won the employee of the month award.

Noida, India

Sep. 2011 - Jan. 2013

Aricent Group

SOFTWARE ENGINEER

- Porting of various device drivers on emulated hardware provided by QEMU.
- Solved real time customer problems (pronto)

Gurgaon, India

Jul. 2010 - Aug. 2011

Technical Skills

Programming Languages & Frameworks

JAVA, ANDROID, C, JAVASCRIPT, LATEX

Tools & Technologies

GIT, SVN, ECLIPSE, ANDROID STUDIO, AGILE

Projects (in the last three years)

Programming Principles and Abstraction for Privacy (SFB subproject), Funded by Deutsche Forschungsgemeinschaft (DFG)

University of Potsdam

THE "PROGRAMMING PRINCIPLES AND ABSTRACTION FOR PRIVACY" PROJECT HAS FOLLOWING OBJECTIVES:

Mar. 2019 - Ongoing

- To build programming language abstractions and programming principles that allow an app developer to enforce privacy by design.
- Develop a system where app developers will be able to structure their code into modules, each module providing a certain functionality and requiring certain permissions.

SmartPriv, Funded by the German Federal Ministry of Education and Research

University of Potsdam

THE "SMART PRIVACY IN MOBILE APPS (SMARTPRIV)" PROJECT HAS THREE FUNDAMENTAL OBJECTIVES:

Mar. 2017 - Mar. 2019

- Technical description of Android permissions should be made clearer.
- Show users the usage and sharing of their personal information by an app. This can be achieved with the illustration of the memory access, e.g., a personal picture with the following subtitling can be shown: "The app has access to your private photos."
- Users should be able to revoke or grant the permissions at runtime. Thus, it should be possible to withdraw an app's rights selectively at runtime without breaking the functionality.
- **Contributions**
 - Developed a novel framework to identify inter-app communication flows in Android.
 - Implemented a framework to distinguish user defined flows from illicit flows.
 - Discovered 62 privacy flows violations, suggested corresponding app developers the improvement.
 - Developed a novel framework to detect a critical vulnerability in Android inter-app communication. Discovered 70 sever vulnerabilities.
 - Implemented all work packages assigned to the University of Potsdam.

SMAPPER, Funded by EIT Digital

Saarland University

SMAPPER PROPOSES A NOVEL TECHNOLOGY THAT ESTIMATES THE RISK LEVEL OF MOBILE APPS BY:

Jan. 2016 - Sep. 2016

- Obtaining a reliable third party evaluation of the security level of a mobile application.
- Easily detection of risky/critical behavior and unusual/anomalous permissions before the app's actual installation.
- **Contributions**
 - Designed the framework to identify and report (potentially) risky behaviors of Android apps.
 - Implemented all work packages assigned to the Saarland University.

Teaching

Introduction to the Android Security

University of Potsdam

INSTRUCTOR

Summer 2019

- This course aims to provide a solid foundation on Android application security.

Research Seminar

University of Potsdam

TEACHING ASSISTANT

Summer 2018, 2017

- This course aims to present and discuss current research trends in the areas of program analysis.

Secure Information Flow

University of Potsdam

TEACHING ASSISTANT

Winter Term 2016-2017

- This course aims to provide a solid foundation on various program analysis techniques.

Supervised Theses

Bachelor Theses

University of Potsdam

COMPLETED/ONGOING

- Moritz Schaub, Sticky Vulnerabilities of Android (Ongoing)
- Jonathan Can Kleiner, Reproduction study of Smali Slicing (Ongoing)
- Enrico Hoschler, Information flow control for Hybrid Android applications (Completed)
- Christopher Ketzler, Information Flow Control for Rhino -The Javascript engine (Completed)
- Robin Ratsch, Enhancing R-Droid – Finding User Intended Information Flows (Completed)

Master Theses

University of Potsdam

ONGOING

- Laurin Lieblich, Static Discovery of Android Bugs

Academic Service

INVITED REVIEWER FOR THE JOURNAL OF COMPUTER SECURITY

2019

EXPERT PANEL MEMBER ON THE REACCREDITATION OF THE DOCTORAL PROGRAM AT UNIVERSITY OF ZAGREB

2017

EXPERT PANEL MEMBER ON THE REACCREDITATION OF THE DOCTORAL PROGRAM AT UNIVERSITY OF ZADAR

2017

Publications

SecureComm, 2019 (Rank A, Source ERA)

Orlando, US

TIWARI, A.,; GROß, S., AND HAMMER, C.

- IIFA: Modular Intent Information Flow Control for Android. Accepted for publication.

SCAM, 2019 (Rank C, Source ERA)

Cleveland, US

TIWARI, A.,; PRAKASH, J., GROß, S., AND HAMMER, C.

- LUDroid: A Large Scale Analysis of Android – Web Hybridization. Accepted for publication.

ECOOP, 2019 (Rank A, Source ERA)

London, UK

TIWARI, A.,; GROß, S., AND HAMMER, C.

- IIFA: Modular Intent Information Flow Control for Android. Invited Poster.
- A Central and Evolving Benchmark. Invited talk, Benchwork@ECOOP, 2019.

ESORICS, 2018 (Rank A, Source ERA)

Barcelona, Spain

GROß, S., TIWARI, A.,; AND HAMMER, C.

- PIAlyzer: A precise approach for PendingIntent vulnerability analysis. In Computer Security, pp 41-59, Springer LNCS, 11099.

SecureComm, 2018 (Rank A, Source ERA)

Singapore

TIWARI, A.,; BENDUN, F. AND HAMMER, C.

- A Formal Logic Framework for the Automation of the Right to be Forgotten In Security and Privacy in Communication Networks, pp 95-111, Springer LNICST, 238.

SecureComm, 2017 (Rank A, Source ERA)

Niagara Falls, Canada

GROß, S., TIWARI, A.,; AND HAMMER, C.

- ThiefTrap – An Anti-Theft Framework for Android. In Security and Privacy in Communication Networks, pp 167-184, Springer, LNICST 238

References

Prof. Dr.-Ing. Christian Hammer

UNIVERSITY OF POTSDAM, POTSDAM, GERMANY

Software Engineering Chair

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Prof. Dr. Alessandra Gorla

IMDEA SOFTWARE INSTITUTE, MADRID, SPAIN

Software Engineering Chair

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Dr.-Ing. Sven Bugiel

CISPA HELMHOLTZ CENTER FOR INFORMATION SECURITY, SAARLAND, GERMANY

Head of Trusted Systems Group

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Ravi Dubey

TRUMINDS SOFTWARE SYSTEM

AVP-Engineering

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