

Academic Employment

Oct 2014–present **Postdoctoral Researcher**, Technische Universität Darmstadt, Germany.
Host Eric Bodden

Education

2014 **Ph.D.**, *Computer Science*, University of Waterloo, Canada.
Advisor Ondřej Lhoták
Thesis The Separate Compilation Assumption
Committee Jan Vitek, Frank Tip, Reid Holmes, and Werner Dietl

2010 **MMath**, *Computer Science*, University of Waterloo, Canada.
Advisor Raouf Boutaba
Thesis Algorizmi - A Configurable Virtual Testbed to Generate Datasets for Offline Evaluation of Intrusion Detection Systems
Reviewers Ian MacKillop and Urs Hengartner

2007 **B.Sc.**, *Computer Science*, The American University in Cairo, Egypt.
Advisors Sherif G. Aly and Sherif El-Kassas
Thesis A Jabber Framework for Building Communication Capable Java Mobile Applications
Minor Mathematics

Research Experience

2014–present **Postdoctoral Researcher**, *Secure Software Engineering*, Technische Universität Darmstadt, Germany.
 o Designing novel static analyses to detect misuses of cryptographic APIs in software systems.
 o Exploring new static analysis techniques that incorporate user feedback in a just-in-time fashion.
 o Developing various extensions to the IFDS analysis framework.

2010–2014 **Research Assistant**, *Programming Languages Group*, University of Waterloo, Canada.
 o Conducted research for constructing partial static call graphs for Java programs.
 o Developed various call graph construction algorithms for Scala.
 o Studied static analysis techniques for various JVM-hosted languages.

2008–2009 **Research Assistant**, *Network Security Research Group*, University of Waterloo, Canada.
 o Worked on various models of Intrusion Detection Systems: e.g., peer-to-peer, kernel methods.
 o Developed Algorizmi, an open-source evaluation system for Intrusion Detection Systems.

2007 **Researcher**, *Department of Computer Science*, The American University in Cairo, Egypt.
 o Studied new techniques to support location management in Java-based pervasive systems.

Industrial Experience

2007 **Software Engineer**, *Execution Team*, ITWorx, Egypt.
 o Improved user experience by redesigning major system components of a stock brokerage system.
 o Used .Net framework, C#, CRM technologies during development.

Publications

Refereed Journal Articles (2 total)

- TOSEM '15 **Karim Ali**, Marianna Rapoport, Ondřej Lhoták, Julian Dolby, and Frank Tip. "Type-Based Call Graph Construction Algorithms for Scala". In: *ACM Transactions on Software Engineering and Methodology* 25.1 (2015), p. 9.
- IJCSNS '08 Sherif G Aly, Sarah Nadi, and **Karim Hamdan**. "A Java-Based Programming Language Support of Location Management in Pervasive Systems". In: *International Journal of Computer Science and Network Security* 8.6 (2008), pp. 329–336.

Refereed Conference Publications (5 total)

- ECOOP '16 Johannes Späth, Lisa Nguyen, **Karim Ali**, and Eric Bodden. "Boomerang: Demand-Driven Flow-Sensitive, Field-Sensitive, and Context-Sensitive Pointer Analysis". In: *European Conference on Object-Oriented Programming*.
To Appear
- Onward! '15 Steven Arzt, Sarah Nadi, **Karim Ali**, Eric Bodden, Sebastian Erdweg, and Mira Mezini. "Towards Secure Integration of Cryptographic Software". In: *Proceedings of the SIGPLAN Symposium on New Ideas in Programming and Reflections on Software at SPLASH*. Pittsburgh, Pennsylvania, United States, 2015, (Acceptance Rate: 35%).
- ECOOP '14 **Karim Ali**, Marianna Rapoport, Ondřej Lhoták, Julian Dolby, and Frank Tip. "Constructing Call Graphs of Scala Programs". In: *Proceedings of the 28th European Conference on Object-Oriented Programming*. Uppsala, Sweden, 2014, pp. 54–79. (Acceptance Rate: 26%).
- ECOOP '13 **Karim Ali** and Ondřej Lhoták. "Averroes: Whole-Program Analysis without the Whole Program". In: *Proceedings of the 27th European Conference on Object-Oriented Programming*. Montpellier, France, 2013, pp. 378–400. (Acceptance Rate: 25%).
- ECOOP '12 **Karim Ali** and Ondřej Lhoták. "Application-Only Call Graph Construction". In: *Proceedings of the 26th European Conference on Object-Oriented Programming*. Beijing, China, 2012, pp. 688–712. (Acceptance Rate: 19%).

Validated Artifacts (2 total, 1 distinguished artifact)

- ECOOP '14 **Karim Ali**, Marianna Rapoport, Ondřej Lhoták, Julian Dolby, and Frank Tip. "Constructing Call Graphs of Scala Programs". In: *European Conference on Object-Oriented Programming*. 2014.
Distinguished Artifact
- ECOOP '13 **Karim Ali** and Ondřej Lhoták. "Averroes: Whole-Program Analysis without the Whole Program". In: *European Conference on Object-Oriented Programming*. 2013.

Other Refereed Publications (2 total)

- GIIS '09 **Karim Ali**, Issam Aib, and Raouf Boutaba. "P2P-AIS: A P2P Artificial Immune Systems architecture for detecting DDoS flooding attacks". In: *Global Information Infrastructure Symposium*. Hammamet, Tunisia, 2009.
- GIIS '09 **Karim Ali** and Raouf Boutaba. "Applying Kernel Methods to Anomaly-based Intrusion Detection Systems". In: *Global Information Infrastructure Symposium*. Hammamet, Tunisia, 2009.

Research Demonstrations (1 total)

- ECOOP '13 **Karim Ali**. "Averroes: Whole-Program Analysis without the Whole Program". In: *European Conference on Object-Oriented Programming*. 2013.

Posters (1 total)

- Cheriton '13 **Karim Ali**. "Averroes: Whole-Program Analysis without the Whole Program". In: *Cheriton Symposium*. University of Waterloo, Canada, 2013.

Teaching

Lecturer

- Spring 2016 **Technische Universität Darmstadt**, Applied Static Analysis, Co-lecturer.
- Winter 2015 **Technische Universität Darmstadt**, Static Analysis Seminar.

Substitute Lecturer

- Winter 2014 **Technische Universität Darmstadt**, Designing Code Analyses for Large Software Systems.
Spring 2013 **University of Waterloo**, CS241, Foundations of Sequential Programs.

Graduate Teaching Assistant

- 2011–2013 **University of Waterloo**, CS241, Foundations of Sequential Programs.
2011–2013 **University of Waterloo**, CS444/644, Compiler Construction.
Spring 2011 **University of Waterloo**, CS456/656, Software Design and Architectures.
2008–2010 **University of Waterloo**, CS456/656, Computer Networks.
Winter 2008 **University of Waterloo**, CS125, Introduction to Programming Principles.
Fall 2007 **The American University in Cairo**, CS448, Security Engineering.

Undergraduate Teaching Assistant

- Spring 2007 **The American University in Cairo**, CS448, Security Engineering.
2005–2006 **The American University in Cairo**, CS330, Computer Architecture.
2004–2005 **The American University in Cairo**, CS106, Fundamentals of Computer Science.

Advising

Ph.D. Students (Technische Universität Darmstadt)

- 2015-present **Johannes Späth**, Scalable Rich Pointer Analysis, expected 2018.
2015-present **Stefan Krüger**, Detecting Misuses of Cryptographic APIs, expected 2019.
2015-present **Lisa Nguyen**, Human-Oriented Program Analysis, expected 2019.

Master's Students (Technische Universität Darmstadt)

- 2016-present **Manuel Benz**, Interprocedural Data Dependency Graphs.
2016-present **Michael Appel**, Call Graph Summaries for the Android SDK.

Research Assistants (Technische Universität Darmstadt)

- 2015-present **Manuel Benz**, Mining GitHub Repositories for Misuses of Cryptographic APIs.
Winter 2015 **Sachin Pattan**, Finding Common Patterns of Using Cryptographic APIs in Android Apps.

Professional Service

Conference Committees

- ISSTA '16 Artifact Evaluation Committee Member, International Symposium on Software Testing and Analysis
PLDI '15 Artifact Evaluation Committee Member, ACM SIGPLAN Conference on Programming Language Design and Implementation
ECOOP '15 Artifact Evaluation Committee Member, European Conference on Object-Oriented Programming
ECOOP '14 Artifact Evaluation Committee Member, European Conference on Object-Oriented Programming

Conference Organization

- ECOOP '18 Publicity Chair and Webmaster, European Conference on Object-Oriented Programming
ISSTA '18 Publicity Chair and Webmaster, International Symposium on Software Testing and Analysis
DECAF@ISSTA '16 Main Organizer, Designing Code Analysis Frameworks
SOAP@PLDI '16 Co-organizer, The International Workshop on the State Of the Art in Java Program Analysis
PLDI '15 Co-organizer, Workshop on WALA

Reviewer

- SCP Science of Computer Programming

Volunteer Work

Fall 2013	Graduate Student Ambassador , <i>School of Computer Science</i> , University of Waterloo, Canada.
Winter 2012	Tour Guide , <i>Computer Science Open House</i> , University of Waterloo, Canada.
2010–2011	President , <i>Egyptian Students Association</i> , University of Waterloo, Canada.
Spring 2007	Ushers Committee Leader , <i>Honors Assembly</i> , The American University in Cairo, Egypt.
Spring 2007	Academic Committee Head , <i>ACM Chapter</i> , The American University in Cairo, Egypt.

Awards and Honors

2014	Distinguished Artifact Award , <i>European Conference on Object-Oriented Programming</i> .
2012–2014	David R. Cheriton Scholarship , <i>University of Waterloo, Canada</i> , \$20,000.
2012	University of Waterloo Special Graduate Scholarship , <i>Canada</i> , \$2,500.
2012	Queen Elizabeth II Graduate Scholarship in Science and Technology , <i>Canada</i> , \$5,000.
2011	University of Waterloo Special Graduate Scholarship , <i>Canada</i> , \$1,000.
2008	University of Waterloo Graduate Entrance Scholarship , <i>Canada</i> , \$3,000.
2007	B.Sc. Summa Cum Laude Honors , <i>The American University in Cairo</i> , Egypt.
2007	Best CS Group Graduation Project Award , <i>The American University in Cairo</i> , Egypt.
2003–2007	Shell Endowed Scholarship , <i>The American University in Cairo</i> , Egypt, 30% off tuition.

Artifacts

averroes	A tool that enables any Java analysis framework to analyze partial programs. http://github.com/karimhamdanali/averroes/
scalacg	A Scala compiler plugin for call graph construction. http://github.com/olhotak/scalacg
cgc	Datalog implementation of the <i>separate compilation assumption</i> . http://plg.uwaterloo.ca/~karim/projects/cgc/
algorizmi	An open-source cloud-based testbed for evaluating Intrusion Detection Systems. http://sourceforge.net/projects/algorizmi/
beep	XMPP (Jabber) framework for instant messaging and presence for Java, Micro Edition. http://sourceforge.net/projects/beep/

Languages

English	Fluent
Arabic	Mother Tongue
French	Novice
German	Novice

Residency Status

Canadian Citizen

References

Ondřej Lhoták, *Ph.D.*, (Ph.D. Advisor).

Associate Professor

David R. Cheriton School of Computer Science, University of Waterloo

200 University Avenue West, Waterloo, Ontario N2L 3G1, Canada

☎ +1 (519) 888-4567 ext. 36654

🖨 +1 (519) 885-1208

✉ olhotak@uwaterloo.ca

🌐 plg.uwaterloo.ca/~olhotak

Frank Tip, *Ph.D.*

Principal Engineer

Samsung Research America

665 Clyde Avenue, Mountain View, CA 94043, USA

☎ +1 (650) 210-1001

✉ ftip@samsung.com

🌐 franktip.org

Eric Bodden, *Ph.D.*, (Postdoc Host).

Professor

Technische Universität Darmstadt

Rheinstraße 75, B5.11, 64295, Darmstadt, Germany

☎ +49 6151 16-75422

🖨 +49 6151 16-72051

✉ eric.bodden@cased.de

🌐 bodden.de

Julian Dolby, *Ph.D.*

Research Staff Member

IBM Thomas J. Watson Research Center

Yorktown Heights, NY USA

☎ +1 (914) 945-2452

✉ dolby@us.ibm.com

🌐 researcher.watson.ibm.com/researcher/view.php?person=us-dolby

Jan Vitek, *Ph.D.*

Professor

College of Computer and Information Science, Northeastern University

440 Huntington Avenue, Boston, Massachusetts 02115, USA

📞 +1 (765) 409-2176

✉ j.vitek@neu.edu

🌐 janvitek.org