

Academic Employment

Jul 2016–Present **Research Assistant Professor**, University of Alberta, Canada.
Oct 2014–Jul 2016 **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.
◦ Designing novel static analyses to detect misuses of cryptographic APIs in software systems.
◦ Exploring new static analysis techniques that incorporate user feedback in a just-in-time fashion.
◦ Developing various extensions to the IFDS analysis framework.

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

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

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

Industrial Experience

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

Publications

Refereed Journal Articles

- 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

- 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*. 2016, (Acceptance Rate: 31.6%).
- 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

- 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

- 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

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

Posters

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

Teaching

Lecturer

- Fall 2016 **University of Alberta**, Static Program Analysis.
- 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.
- 2015-2016 **Stefan Triller**, Deutsche Telekom.

Master's Students (Technische Universität Darmstadt)

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

Research Assistants (Technische Universität Darmstadt)

- 2015-2016 **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

- Onward '17 Program Committee Member, ACM International Symposium on New Ideas, New Paradigms, and Reflections on Programming and Software
- 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
- FSE '17 Tools track Co-chair, Foundations of Software Engineering

WALA@PLDI '17 Co-organizer, WALA Hackathon
SOAP@PLDI '17 Co-organizer, The International Workshop on the State Of the Art in Java Program Analysis
DECAF@ISSTA '16 Main Organizer, Designing Code Analysis Frameworks
WoW@PLDI '15 Co-organizer, Workshop on WALA
Reviewer
SCP Science of Computer Programming
TSE Transactions on Software Engineering

Volunteer Work

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

Awards and Honors

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