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Karim Ali

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 (SSE) group*, Technische Universität Darmstadt, Germany.
o Designing novel static analyses to detect misuses of cryptographic APIs in software systems.
o Developing ranking metrics for the results of static analyses to improve developers' productivity.

2010–2014 **Research Assistant**, *Programming Languages Group (PLG)*, 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**, *Secutiry 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.

Publications

Refereed Journal Articles (2 total, 1 under review)

- TOPLAS
Submitted **Karim Ali**, Marianna Rapoport, Ondřej Lhoták, Julian Dolby and Frank Tip. “Constructing Call Graphs of Scala Programs”, in *ACM Transactions on Programming Languages and Systems*, (under review, ID: TOPLAS-00058-2014).
- 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, 329–336.

Refereed Conference Publications (4 total, 1 under review)

- PLDI
Submitted Xiaoni Lai, Zhaoyi Luo, **Karim Ali**, Ondřej Lhoták, Julian Dolby and Frank Tip. “Evaluating Static Analysis for JVM-hosted Language Implementations”, in *the 36th ACM SIGPLAN Conference on Programming Language Design and Implementation*, (under review).
- ECOOP '14 **Karim Ali**, Marianna Rapoport, Ondřej Lhoták, Julian Dolby and Frank Tip. “Constructing Call Graphs of Scala Programs”, in *the 28th European Conference on Object-Oriented Programming*, 54–79, Uppsala, Sweden, 2014. *Acceptance rate: 26%*
- ECOOP '13 **Karim Ali** and Ondřej Lhoták. “Averroes: Whole-Program Analysis without the Whole Program”, in *the 27th European Conference on Object-Oriented Programming*, 378–400, Montpellier, France, 2013. *Acceptance rate: 25%*
- ECOOP '12 **Karim Ali** and Ondřej Lhoták. “Application-Only Call Graph Construction”, in *the 26th European Conference on Object-Oriented Programming*, 688–712, Beijing, China, 2012. *Acceptance rate: 19%*

Validated Artifacts (2 total, 1 distinguished artifact)

- ECOOP '14
Distinguished Artifact **Karim Ali**, Marianna Rapoport, Ondřej Lhoták, Julian Dolby and Frank Tip. “Constructing Call Graphs of Scala Programs”, in *the 28th European Conference on Object-Oriented Programming*, 2014.
- ECOOP '13 **Karim Ali** and Ondřej Lhoták. “Averroes: Whole-Program Analysis without the Whole Program”, in *the 27th 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 *the 27th European Conference on Object-Oriented Programming*, 2013.

Posters (1 total)

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

Industrial Employment

- 2007 **Software Engineer**, *Execution Team*, ITWorx, Egypt.
- o Redesigned the graphical user interface of the stock brokerage system for Execution Ltd.
 - o Improved user experience by redesigning major system components.
 - o Enhanced code readability by reviewing the previously written code.
 - o Used .Net framework, C#, CRM technologies during development.

Teaching Experience

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.

Professional Services

- WoW '15 **Workshop Co-organizer**, *Workshop on Wala*, co-located with the 36th ACM SIGPLAN conference on Programming Language Design and Implementation, PLDI '15.
- ECOOP AEC '15 **Program Committee Member**, *Artifact Evaluation Committee*, the 29th European Conference on Object-Oriented Programming.
- ECOOP AEC '14 **Program Committee Member**, *Artifact Evaluation Committee*, the 28th European Conference on Object-Oriented Programming.
- TSE '13 **Reviewer**, *Transactions on Software Engineering*.

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.

Leadership and Volunteer Work

Fall 2013	Graduate Student Ambassador , <i>David R. Cheriton 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>Association for Computer Machinery (ACM)</i> , The American University in Cairo, Egypt.

Software

scalacg	A Scala compiler plugin for call graph construction. http://github.com/olhotak/scalacg
averroes	A tool that enables any Java analysis framework to analyze partial programs. http://plg.uwaterloo.ca/~karim/projects/averroes/
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	An open-source implementation of the Jabber protocol for the Java mobile platform. http://sourceforge.net/projects/beep/

Languages

Arabic	Mother Tongue	
English	Fluent	
French	Novice	<i>basic words and phrases</i>
German	Novice	<i>currently taking courses</i>

Residency Status

Canada	Permanent Resident
Germany	Work Visa
Egypt	Citizen