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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.
◦ Designing novel static analyses to detect misuses of cryptographic APIs in software systems.
◦ 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.
◦ 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**, *Secutiry 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.
 o Studied new techniques to support location management in Java-based pervasive systems.

Publications

Refereed Journal Publications (1 total)

- 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 (4 total)

- 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*. Onward! '15. 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*. ECOOP '14. Uppsala, Sweden, 2014, (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*. ECOOP '13. Montpellier, France, 2013, (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*. ECOOP '12. Beijing, China, 2012, (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: *Proceedings of the 28th European Conference on Object-Oriented Programming*. ECOOP '14. Springer, 2014.
- 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*. ECOOP '13. Springer, 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*. GIIS '09. Hammamet, Tunisia, 2009.
- GIIS '09 **Karim Ali** and Raouf Boutaba. "Applying Kernel Methods to Anomaly-based Intrusion Detection Systems". In: *Global Information Infrastructure Symposium*. GIIS '09. 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*. ECOOP '13. Montpellier, France, 2013.

Posters (1 total)

- Cheriton '13 **Karim Ali**. "Averroes: Whole-Program Analysis without the Whole Program". In: *Cheriton Symposium*. Cheriton '13. 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

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

- 2015-present **Johannes Späth**, Technische Universität Darmstadt, CS, expected 2017.
2015-present **Stefan Krüger**, Technische Universität Darmstadt, CS, expected 2019.
2015-present **Lisa Nguyen**, Technische Universität Darmstadt, CS, expected 2019.
2015-present **Stefan Triller**, Technische Universität Darmstadt, CS, expected 2018.

Research Assistants

- Summer 2015 **Michael Benz**, Technische Universität Darmstadt, CS.
Winter 2015 **Sachin Pattan**, Technische Universität Darmstadt, CS.

Professional Services

- ISSTA AEC '16 **Program Committee Member**, *Artifact Evaluation Committee*, the The International Symposium on Software Testing and Analysis.
SCP '15 **Reviewer**, *Science of Computer Programming*.
PLDI AEC '15 **Program Committee Member**, *Artifact Evaluation Committee*, the 36th ACM SIGPLAN conference on Programming Language Design and Implementation.

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

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, Egypt</i> .
2007	Best CS Group Graduation Project Award , <i>The American University in Cairo, Egypt</i> .
2003-2007	Shell Endowed Scholarship , <i>The American University in Cairo, Egypt</i> , 30% off.

Leadership and Volunteer Work

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

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://github.com/karimhamdanali/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	Java mobile platform. http://sourceforge.net/projects/beep/

Languages

Arabic	Mother Tongue
English	Fluent

French **Novice**
German **Novice**

basic words and phrases
basic words and phrases

Residency Status

Canada **Citizen**
Germany **Work Visa**
Egypt **Citizen**

References

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

Associate Professor

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

Professor

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Frank Tip, *Ph.D.*

Principal Engineer

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Julian Dolby, *Ph.D.*

Research Staff Member

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Jan Vitek, *Ph.D.*

Professor

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440 Huntington Avenue, Boston, Massachusetts 02115, USA

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