

**Technische Universität Darmstadt**  
**Department of Computer Science**  
Rheinstraße 75, B5.07  
64295, Darmstadt  
Germany  
☎ +49 6151 869-512  
☎ +49 152 04708041  
✉ karim.ali@cased.de  
🌐 karimali.ca

# Karim Ali

## Academic Employment

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

## Education

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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

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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.  
○ 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 (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

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### *Refereed Journal Articles (2 total)*

- TOSEM **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* (to appear, ID: TOSEM-2015-0035).
- 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

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- 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

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### *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

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### *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 **Manuel Benz**, Technische Universität Darmstadt, CS.

Winter 2015 **Sachin Pattan**, Technische Universität Darmstadt, CS.

## Professional Services

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ECOOP '18 **Publicity Chair**, *Organization Committee*, the 32nd European Conference on Object-Oriented Programming and the International Symposium on Software Testing and Analysis.

ISSTA AEC '16 **Program Committee Member**, *Artifact Evaluation Committee*, 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**, *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

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- 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

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- Fall 2013 **Graduate Student Ambassador**, *David R. Cheriton 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**, *Association for Computer Machinery (ACM)*, The American University in Cairo, Egypt.

## Software

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- 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 *separate compilation assumption*.  
<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

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Arabic **Mother Tongue**

English **Fluent**

French **Novice**

*basic words and phrases*

German **Novice**

*basic words and phrases*

## Residency Status

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Canada **Citizen**

Germany **Work Visa**

Egypt **Citizen**

## References

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**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

1732 N. First Street, 6th Floor, San Jose, California 95112, USA

✉ 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