

# Khaled Ahmed

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EDUCATION      **Electrical and Computer Engineering, University of British Columbia, Canada**  
Doctorate of Philosophy in Electrical and Computer Engineering      (Sept. 2017 to date)  
• Development of dynamic taint analysis and slicing tools for Android and Java programs.  
• Reverse engineering and analysis of Android malware that infiltrated the Google Play store.  
• Development of automated dynamic analysis tools for Android malware detection.

**Faculty of Engineering, Alexandria University, Alexandria, Egypt**  
Masters of Science in Electrical and Electronic Engineering      (Sept. 2014 to July 2017)  
• CDMA Network-on-chip design.  
• Software/Hardware Co-design of cryptographic applications.  
• Grade: Distinction with degree of honor (GPA: 3.95/4)

Bachelor's Degree in Electrical and Electronic Engineering      (Sept. 2009 to July 2014)  
• Thesis: ASIC implementation of TMS320C25 DSP (With Si-Ware Systems and FabCat)  
• Grade: Distinction with degree of honor (GPA: 3.94/4, **Rank: 2<sup>nd</sup>/332**)

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PAPERS IN SOFTWARE ENGINEERING      **Khaled Ahmed**, Yingying Wang, Mieszko Lis, Julia Rubin. "ViaLin: Path-Aware Dynamic Taint Analysis for Android". *The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (FSE), 2023.*

Sahar Badihi, **Khaled Ahmed**, Yi Li, Julia Rubin. "Responsibility in Context: On Applicability of Slicing in Semantic Regression Analysis". *The 45th IEEE/ACM International Conference on Software Engineering (ICSE), 2023.*

Michael Cao\*, **Khaled Ahmed\***, Julia Rubin, "Spoiled Apples Ruin the Bunch: Anatomy of Google Play Malware", *The 44th ACM/IEEE International Conference on Software Engineering (ICSE), 2022. \*Equal contribution*

**Khaled Ahmed**, Mieszko Lis, Julia Rubin, "MANDOLINE: Dynamic Slicing of Android Applications with Trace-Based Alias Analysis", *IEEE International Conference on Software Testing, Verification and Validation (ICST), Distinguished Paper Award, 2021*

**Khaled Ahmed**, Mieszko Lis, Julia Rubin, "Slicer4J: A Dynamic Slicer For Java", *ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), tools track, 2021*

Michael Cao, Sahar Badihi, **Khaled Ahmed**, Peiyu Xiong, Julia Rubin. "On Benign Features in Malware Detection". *The 35th IEEE/ACM International Conference on Automated Software Engineering (ASE), short paper, 2020*

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PAPERS IN DIGITAL HARDWARE DESIGN      **Khaled E. Ahmed**, Mohamed R. Rizk, Mohammed M. Farag, "Overloaded CDMA Crossbar for Network-On-Chip", *IEEE Transactions on Very Large Scale Integration Systems, Volume: 25, Issue: 6, June 2017.*

**Khaled E. Ahmed**, Mohamed R. Rizk, Mohammed M. Farag, "Overloaded CDMA Interconnect for Network-on-Chip (OCNoC)", *IEEE International Conference on Reconfigurable Computing and FPGAs (ReConfig), 2016.*

**Khaled E. Ahmed**, Mohamed R. Rizk, Mohammed M. Farag, “Aggregated CDMA Crossbar for Network-on-Chip”, *International Conference on Microelectronics (ICM)*, 2016. **Best poster award**

Ahmed S. Eissa, Mahmoud A. Elmohr, Mostafa A. Saleh, **Khaled E. Ahmed**, Mohammed M. Farag, “Hardware Implementation of A SHA-3 Application-Specific Instruction Set Processor”, *International Conference on Microelectronics (ICM)*, 2016.

Mostafa Medra, **Khaled E. Ahmed**, Timothy N. Davidson, “MOSIC: A New Ordering for OSIC MIMO Detection”, *IEEE International workshop on Signal Processing advances in Wireless Communications (SPAWC)*, 2016.

Ahmed S. Eissa, Mahmoud A. Elmohr, Mostafa A. Saleh, **Khaled E. Ahmed**, Mohammed M. Farag, “SHA-3 Instruction Set Extension for A 32-bit RISC Processor Architecture”, *IEEE International Conference on Application-specific Systems, Architectures and Processors*, 2016.

**Khaled E. Ahmed**, Kareem M. Attiah, Ahmed S. Eltrass, “Multiple Signal Classification Algorithm Compensated by Extended Kalman Particle Filtering for Wi-Fi Through Wall Multi-Target Tracking”, *IEEE-APS Topical Conference on Antennas and Propagation in Wireless Communications*, 2016.

**Khaled E. Ahmed**, Mohammed M. Farag, “Hardware/Software Co-Design of A Dynamically Configurable SHA-3 System-on-Chip (SoC)”, *IEEE International Conference on Electronics, Circuits, and Systems (ICECS)*, 2015.

**Khaled E. Ahmed**, Mohammed M. Farag, “Parallel Overloaded CDMA Interconnect (OCI) Bus Architecture for On-Chip Communications”, *IEEE International Conference on Electronics, Circuits, and Systems (ICECS)*, 2015.

**Khaled E. Ahmed**, Mohammed M. Farag, “Enhanced Overloaded CDMA Interconnect (OCI) Bus Architecture for on-Chip Communication”, *IEEE Annual Symposium of High Performance Interconnects (HOTI)*, 2015.

**Khaled E. Ahmed**, Mohammed M. Farag, “Overloaded CDMA Bus Topology for MPSoC Interconnect”, *IEEE International Conference on Reconfigurable Computing and FPGAs (ReConfig)*, 2014.

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INTERNSHIPS

**Formal Methods Lab, Huawei Technologies Canada**, Waterloo, Canada  
(May 2023 to Sept. 2023)

- Stateful property based testing in production code.
- Developed and maintained the backlog system for the lab.
- Researched methods to help developers adopt property based testing

**Ecole Polytechnique Federale de Lausanne (EPFL)**, Lausanne, Switzerland  
(July 2014 to Sept. 2014)

- Exploiting parallelism in hardware accelerators using High Level Synthesis.

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TEACHING  
EXPERIENCE

**University of British Columbia**, Vancouver, Canada (Winter 2018 to date)

- Software Engineering (CPEN 321)
- Computing Systems I (CPEN 211)
- Computer Architecture (CPEN 411)
- Computing Systems II (CPEN 212)

**Alexandria University**, Alexandria, Egypt (Fall 2014 to Spring 2017)

- x86 Microprocessors
- Logic Circuit Design
- Modeling and Design of VLSI Integrated Circuits
- Computer Architecture
- Digital Integrated Circuits
- Semiconductor Devices

**Online course:** Hardware Design using VHDL

[vlsiacademy.org/vhdl1.html](https://vlsiacademy.org/vhdl1.html)

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OPEN-SOURCE  
CONTRIBUTIONS

- *Mandoline* (<https://github.com/recess/Mandoline/>): an accurate, low-overhead dynamic slicer for Android. Mandoline automatically generates a backward dynamic slice from a user selected executed statement and variables used in the statement. Mandoline is the first dynamic slicer for Android apps that accounts for data flows through fields and framework methods.
  - *Slicer4J* (<https://github.com/recess/Slicer4J/>): a version of *Mandoline* designed for Java executables. It relies on soot, a popular Java analysis framework which currently supports instrumenting programs compiled with up to Java 9.
  - *DCC/L* (<https://github.com/khaled-e-a/Hardware-Software-SHA-3-HLS>): a configurable hardware accelerator for SHA3 algorithm. The accelerator is written in C and deployable on FPGA using High Level Synthesis.
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TALKS

**Invited Talks**

- Tech talk “Malware Detection and Analysis”, Google, 2022.
- Guest speaker in “Introduction to Program Analysis Techniques” workshop, Huawei, 2022.
- Guest lecturer in CPEN 400P: Program Analysis for Reliability and Security, UBC, 2022.

**Conference Talks**

Presented my work at:

- ICSE 2022
  - CSER Meeting 2021
  - ESEC/FSE 2021
  - ICST 2021
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AWARDS

- Natural Sciences and Engineering Research Council - Canada Graduate Scholarships (NSERC CGS-D)
  - Four Year Fellowship (FYF) from the University of British Columbia
  - Graduate Support Initiative (GSI) from the University of British Columbia
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SERVICE

- Reviewer: OOPSLA 2022 External Review / Artifact Evaluation
  - Student Volunteer: ICSE 2022
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REFERENCES

Available upon request

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