Ismet Burak Kadron

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Research Interests

My research interests are on program analysis, information theory, security, machine learning (ML). I'm focused on finding methods on automating side-channel analysis and vulnerability detection at the moment. I am also interested in using formal methods for verifying safety and security of ML systems.

Education

2016 - 2021 (est.)	PhD, Computer Science, University of California Santa Barbara, CA, United States.
2010 - 2014	BSc (Honor Graduate), Computer Engineering, Boğaziçi University, İstanbul, Turkey.

Work Experience

2017 - present	**Graduate Student Researcher**, University of California Santa Barbara. Verification Lab (PI Tevfik Bultan). Working on developing side channel detection and analysis techniques. Represented Verification Lab in the last DARPA STAC competition.
Summer 2018	**Research Intern**, Carnegie Mellon University. Verified Software Group (PI Corina S. Păsăreanu). Worked on valid input generation and fuzzing for side channel analysis and neural network analysis using formal methods. Represented the group in DARPA STAC competition, with great results.
2016 - 2018	**Teaching Assistant**, University of California Santa Barbara. Helped with the design of homeworks, grading. Led discussion sections and conducted office hours to help students.
2015	**Teaching Assistant**, Boğaziçi University. Helped with the design of homeworks, grading and teaching. Conducted problem solving sessions.
2013 - 2015	**Part-time Systems Engineer**, AirTies Wireless Networks. Worked on developing an Android application for network measurements and implemented automatic wireless channel switch algorithms.

Publications

- **İsmet Burak Kadron**, Nicolás Rosner, Tevfik Bultan, *AutoProfit: Feedback-driven Automated Detection and Quantification of Network Side-Channels*. In submission for peer review to 42nd International Conference on Software Engineering (ICSE 2020).
- Seemanta Saha, William Eiers, **İsmet Burak Kadron**, Tevfik Bultan, *Incremental Attack Synthesis*. Accepted to Java PathFinder Workshop 2020.
- Divya Gopinath, Mengshi Zhang, Kaiyuan Wang, **İsmet Burak Kadron**, Corina S. Păsăreanu, Sarfraz Khurshid, *Symbolic Execution for Importance Analysis and Adversarial Generation in Neural Networks*. Accepted to the 30th International Symposium on Software Reliability Engineering (ISSRE 2019).
- Nicolás Rosner, **İsmet Burak Kadron**, Lucas Bang, Tevfik Bultan, *Profit: Detecting and Quantifying Side Channels in Networked Applications*. Proceedings of the 26th Annual Network and Distributed System Security Symposium (NDSS 2019).
- Seemanta Saha, **İsmet Burak Kadron**, William Eiers, Lucas Bang, Tevfik Bultan, *Attack Synthesis for Strings using Meta-Heuristics*. ACM SIGSOFT Software Engineering Notes 43(4): 56 (2018). Presented in Java PathFinder (JPF) Workshop 2018.

Research Projects

Profit	Developed a black-box approach and a tool for detecting and quantifying side-channel information leaks in networked applications that communicate over encrypted streams in collaboration with members of Verification Lab.
Attack Synthesis	Developed an approach to synthesize attacks for functions with side-channel vulnerabilities using symbolic execution, model counting and meta-heuristics (simulated annealing or genetic algorithms) in collaboration with members of Verification Lab.

Teaching Experience

Teaching Assistant

Spring 2018	UCSB CS138 Formal Languages and Automata
Winter 2018	UCSB CS130B Data Structures and Algorithms II
Fall 2017	UCSB CS138 Formal Languages and Automata
Spring 2017	UCSB CS162 Programming Languages
Winter 2017	UCSB CS162 Programming Languages
Fall 2016	UCSB CS130A Data Structures and Algorithms I
Fall 2015	BU CMPE540 Principles of Artificial Intelligence
Spring 2015	BU CMPE482 Numerical Linear Algebra

Service

- Local Arrangements Chair for ISSTA 2020
- Student Volunteer for ISSTA 2017 and co-located SPIN 2017
- Co-reviewer for ESEC/FSE 2019
- Co-reviewer for ASE 2018

Main Programming Languages

Python, Java, Scala, Prolog, Matlab, Bash.

Spoken Languages

Fluent in English and Turkish.