Burak Kadron

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Education

September 2022 — **PhD in Computer Science** at University of California Santa Barbara, Santa Barbara, CA
Research Advisor: Tevfik Bultan
Committee: Giovanni Vigna, Yu-Xiang Wang
Dissertation: Detection, Quantification and Mitigation of Network Side Channels

June 2014 — **Bachelor of Science in Computer Engineering** at Bogazici University, Istanbul, Turkey

Experience

Nov 2022 – Ongoing — **Veridise** – Research Scientist.
Working on maintaining and improving the Web3/Blockchain fuzz testing tool called *OrCa* for Solidity language. I've contributed to extending and rewriting OrCa's [V] specification language and SMT-guided fuzzing hint language, adding support for on-chain fuzzing.

2018 – 2022 — **UC Santa Barbara** – Graduate Student Researcher.
Developed novel methods to dynamically detect, quantify and mitigate side-channel information leakage vulnerabilities on encrypted network traffic. Represented the work at DARPA STAC Challenges, developed a tool and published papers on this research.

Summer 2020 — **NASA Ames, KBR Inc.** – Research Intern.
Worked on developing neural network analysis and explainability techniques in collaboration to check for robustness and explain erroneous behaviors for Boeing's neural network that uses runway pictures to determine relative location and published a case study paper about our findings.

Summer 2018 — **Carnegie Mellon University, CyLab** – Research Intern.
Worked to develop input generation techniques for side-channel analysis and represented the CMU team on DARPA STAC challenges. Worked on neural network analysis and adversarial input generation using formal methods.

2016 – 2018 — **UC Santa Barbara** – Teaching Assistant.
Assisted professors with tasks related to administering college level courses, ran office hours, and led problem solving class discussions for courses; Data Structures and Algorithms I (CS 130A), Data Structures and Algorithms II (CS 130B), and Formal Languages and Automata (CS 162).

2013 – 2015 — **Airties Wireless Networks** – Systems and Research Engineer (Part-time).
Worked on the implementation of the mesh networking code in C which assisted the handover of users between Wi-Fi routers.

Publications

M. Downing, W. Eiers, E. DeLong, A. Lodha, B. O. Burns, **B. Kadron**, T. Bultan. "Quantitative Symbolic Robustness Verification for Quantized Neural Networks". In the 2024 International Conference on Formal Engineering Methods. (**ICFEM 2024**).

B. Kadron, C. Shou, E. O'Mahony, T. Bultan. "Detection, Quantification, and Mitigation of Network Side Channels". In the Proceedings of the 12th International Conference on the Internet of Things (**IOT 2022**).

B. Kadron, T. Bultan. "TSA: A Tool to Detect and Quantify Network Side-Channels". In the Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ESEC-FSE 2022**).

B. Kadron, Y. Noller, R. Padhye, T. Bultan, C. S. Păsăreanu, K. Sen. "Fuzzing, Symbolic Execution, and Expert Guidance for Better Testing". In IEEE Software, 2023.

C. Shou, **B. Kadron**, Q. Su, T. Bultan. "CorbFuzz: Checking Browser Security Policies with Fuzzing". In the Proceedings of the 36th IEEE/ACM International Conference on Automated Software Engineering (**ASE 2021**).

B. Kadron, D. Gopinath, C. S. Păsăreanu, H. Yu. "Case Study: Analysis of Autonomous Center Line Tracking Neural Networks". In Software Verification, Springer, Cham, 2021. Presented in 13th Working Conference on Verified Software: Theories, Tools, and Experiments (**VSTTE 2021**).

B. Kadron, N. Rosner, T. Bultan. "Feedback-Driven Side-Channel Analysis for Networked Applications". In the Proceedings of the 29th ACM SIGSOFT International Symposium on Software Testing and Analysis (**ISSTA 2020**).

S. Saha, W. Eiers, **B. Kadron**, T. Bultan. "Incremental Attack Synthesis". In ACM SIGSOFT Software Engineering Notes, 44(4), 2021. Presented in Java Pathfinder Workshop 2019 (**JPF 2019**).

D. Gopinath, M. Zhang, K. Wang, **B. Kadron**, C. S. Păsăreanu, S. Khurshid. "Symbolic Execution for Importance Analysis and Adversarial Generation in Neural Networks". In the Proceedings of 30th International Symposium on Software Reliability Engineering (**ISSRE 2019**).

N. Rosner, **B. Kadron**, L. Bang, T. Bultan. "Profit: Detecting and Quantifying Side Channels in Networked Applications". In the Proceedings of the 26th Annual Network and Distributed System Security Symposium (**NDSS 2019**).

S. Saha, **B. Kadron**, W. Eiers, L. Bang, T. Bultan. "Attack Synthesis for Strings using Meta-Heuristics". In ACM SIGSOFT Software Engineering Notes, 43(4), 2019. Presented in Java Pathfinder Workshop 2018 (**JPF 2018**).

Proficient Programming Languages

Python, Java, C++, C, Bash.

Service

2024	Reviewer for ACM Transactions on Software Engineering and Methodology (TOSEM)
2021 – 2022	President of Graduate Student Executive Committee at UCSB CS Department
2019 – 2020	Treasurer of Graduate Student Executive Committee at UCSB CS Department
2019 – 2020	Co-lead of Talks & Events Committee at UCSB CS Department
2020	Local Arrangements and Finance Chair for ISSTA 2020