Burak Tufekci

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Work Experience

Research Assistant Sept 2021 - Fall 2024 (Expected)

– My research area is developing Machine Learning (ML) based Intrusion Detection System (IDS) for Internet of Things (IoT) and drones. I have been investigating the vulnerabilities and risks associated with these autonomous systems to develop robust countermeasures.

Digital Design Engineer Mar 2021 - Aug 2021

– Digital IP Design: Read-Solomon Encoder and Decoder, AES-128 Block Cipher Encrypt and Decrypt, SERDES, PRNG.

– Digital IP Test: All IP module tests were implemented by using Python scripts.

– Zynq UltraScale+ MPSoC: Both the PL and PS sides of codes were written by using Verilog and C.

– AD9364: RF Communication interface was held by using AD9364 transceiver.

Hardware and Software Design Engineer July 2019 - July 2020

– Digital IP Design: Clarke, Park, CORDIC, PI Controller/Scheduler, PWM, SVM, Encoder Interface, ADC Module.

– Digital IP Test: All IP module tests were implemented by using Python scripts.

– Zynq 7020: PL side of codes were written by using Verilog.

Teaching Assistant Sept 2018 - July 2019

– Lab Assistant: Computer Systems & Architecture, Python for Engineers, Digital Electronics & FPGA Design, Advanced FPGA Design and Computer Arithmetic, System on Chip Design.

Education

2021 - Fall 2024 (Expected)	Ph.D. at **University of North Texas**	(GPA: 4.00/4.00)
2018 - 2020	Master's Degree at **Ozyegin University**	(GPA: 3.80/4.00)
2014 - 2018	Bachelor's Degree at **Dokuz Eylul University**	(GPA: 2.48/4.00)

Skills

Programming Languages	Python, Bash, Verilog HDL
Platforms	Linux, Windows, Raspberry Pi

Publications

Quach, Vinh et al. (2024). "Hazardous Area Aware Path-Planning for Drone Swarms". In: *IEEE International Conference on Mobility: Operations, Services, and Technologies*, pp. 1–9.

Tufekci, Burak, Vinh Quach, et al. (2024). "DUDE-IDS: A Framework for Efficiently Detecting Network-Related Drone Cyberattacks". In: *The IEEE International Conference on Computer Communications and Networks (ICCCN)–SUBMITTED*, pp. 1–9.

Tufekci, Burak, Cihan Tunc, Atakan Arslan, et al. (2024). "Enhancing the Security of the MAVLink with Symmetric Authenticated Encryption for Drones". In: *The IEEE International Conference on Computer Communications and Networks (ICCCN)–SUBMITTED*, pp. 1–9.

Tufekci, Burak et al. (2023). "Efficient Motion Control Strategy for Drone Swarms". In: *International Conference on Recent Advances in Air and Space Technologies (RAST)*, pp. 1–6.

Tufekci, Burak and Cihan Tunc (2021). "Vulnerability and Threat Analysis of UAVs". In: *IEEE International Conference on Computer Systems and Applications*, pp. 1–2.

Tufekci, Burak, Bugra Onal, et al. (2020a). "Efficient FPGA Implementation of Field Oriented Control for 3-Phase Machine Drives". In: *IEEE East-West Design & Test Symposium*, pp. 1–5.

Tufekci, Burak, Bugra Onal, et al. (2020b). "Hardware Implementation of Field Oriented Control for Three Phase Machine Drives". In: *IEEE Signal Processing and Communications Applications Conference*, pp. 1–4.

Projects

Machine Learning-Based Intrusion Detection System for Drones

- Project Output: Implemented a machine learning-based intrusion detection system tailored for drone networks, capable of identifying and mitigating potential threats in real-time.
- Potential Impact: Enhancing the security of drone operations through proactive threat detection and response mechanisms, ensuring safe and reliable deployment across various domains including surveillance, delivery, and infrastructure inspection.

Community Detection for Graph Networks using C++

- Project Output: Developed a novel community detection algorithm in C++ with O(nlogn) time complexity.
- Potential Impact: Improved community detection methods can aid in social network analysis, disease modeling, and recommendation systems, benefiting both online communities and healthcare.

Building FPGA-Based Very Simple CPU with 16 Instructions

- Project Output: Designed a simple CPU using Verilog and Python for educational and embedded system applications.
- Potential Impact: Simple CPUs can find applications in IoT devices, educational tools, and embedded systems, contributing to technological advancements and accessibility.

FPGA-Based vehicle control system

- Project Output: Designed a vehicle control system using FPGA and Bluetooth communication for autonomous driving.
- Potential Impact: FPGA-based vehicle control systems have applications in autonomous vehicles, robotics, and remote operation, advancing transportation and automation technologies.

Honors and Awards

First Place	SIEMENS Tech for Sustainability - March, 2024
Third Place	The spirit of innovation - March, 2023
Best Poster Presentation	IEEE MetroCon - November, 2022
Institute of Science Ph.D. Scholar & Fellow	The University of North Texas - September, 2021
Institute of Science Master's Scholar & Fellow	Ozyegin University - September, 2018