UFUK USUBUTUN

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SUMMARY

In my research, I start with real-world networking systems and protocols, then build models that make sense of them. I then set up experiments in networking testbeds and validate my claims. I have extensive experience interpreting standards in different realms (e.g. IETF, 3GPP, Open-RAN, Ultra Ethernet) and protocol implementations (e.g. Linux TCP). I also bring an expertise in modeling of queuing systems and network optimization.

EDUCATION

New York University Tandon School of Engineering, Brooklyn NY *September 2020 - ongoing*
PhD in Electrical Engineering - Supervisor: Prof. Shivendra Panwar CGPA: 3.81

Bilkent University, Ankara TR *August 2015 - January 2020*
B.Sc. in Electrical and Electronics Engineering CGPA: 3.76
Minor Degree in Political Science CGPA: 3.73

AGH University of Science and Techology, Cracow PL *February 2018 - July 2018*
Exchange Student in Electrical Engineering

EXPERIENCE

Marvell Semiconductor, Santa Clara CA USA June - August 2024
Switch Architect Engineer Intern

Worked on the Ultra Ethernet standards being developed for data center networks. Conducted simulations with proposed congestion control algorithms. Built Markov models to guide the Teralynx switch architecture design.

AT&T Labs, Bedminster NJ USA June - August 2023
Summer Research Intern

Worked on modeling 5G radio resource control layer and adjusting states transitions by tuning inactivity timers to optimize for KPIs, with potential benefits for RAN optimization and Open-RAN implementations.

Nokia Bell Labs, Murray Hill NJ USA June - August 2022
Networking Research Intern

Worked on solving traffic oblivious flow routing problems using a segment routing (SRv6/MPLS) compatible flow placement approach. Efficient solution achieved by adapting the problem to machine learning libraries.

NYU Tandon School of Engineering, Brooklyn NY USA Sept 2021 - *ongoing*
Course Assistant

Teaching, grading, assignment preparation and administrative duties on graduate Internet Architectures & Protocols, Network Modeling & Analysis and Network Security Classes taught by Prof. Shivendra Panwar.

Darkblue Telecommunication Systems, Ankara TR February - August 2020
Project Engineer

Worked on positioning UAVs by tracking time shifts in Channel Reference Signals of multiple LTE base stations and processing with an Extended Kalman Filter model. Collected field samples using software defined radios and implemented a prototype of the localizer on Matlab.

Fraunhofer Institute for Integrated Circuits, Erlangen DE June - September 2019
Undergraduate Research Intern

Developed an OFDM based physical layer cooperative communications simulator on Python for evaluation of proposed relaying schemes. Different diversity techniques exploiting multiple repeater nodes were tested.

PUBLICATIONS

Modeling and Optimizing Dual-Connectivity Activation in Cellular Networks IEEE OJ-COMS
Caglar Tunc, Ufuk Usubutun, Yuxuan Jiang, Shivendra Panwar *In review*

Designing Reliable Virtualized Radio Access Networks IEEE Globecom 2024
Ufuk Usubutun, Andre Gomes, Shankarayanan P. Narayanan, Matti Hiltunen, Shivendra Panwar

Oblivious Routing Using Learning Methods IEEE Globecom 2023
Ufuk Usubutun, Murali Kodialam, T.V. Lakshman, Shivendra Panwar

Do Switches Still Need to Deliver Packets in Sequence? IEEE HPSR 2023
Ufuk Usubutun, Fraida Fund, Shivendra Panwar ***Best Paper Award***

PATENTS

Methods, Systems, and Devices For Determining Inactivity Timer Values in Mobile Networks
Ufuk Usubutun, Yuxuan Jiang, Caglar Tunc, Xuan Tuyen Tran, Aleksandr Zelezniak, Yu Zhou *Pending*

SKILLS

Experience With	**Standards:** IETF RFCs, 3GPP, Open-RAN, Ultra Ethernet Transport **Networking Testbeds and Experimentation:** Analysis of Packet Captures **System Modeling:** Queuing Theory, Markov Chains, TCP Congestion Control Flavors and Loss Detection Algorithms Network Optimization Theory
Related Course Work	Internet Architecture & Protocols, Network Modeling & Analysis, Probability, Cloud Computing & Data Center Networks, Data Structures & Algorithms, Optimization, Wireless Comms., Machine Learning, AI/ML for Networking Reinforcement Learning & Optimal Control, Network Optimization
Programming Experience	*bash* scripting for large scale network experiments, linux kernel patching Python, Matlab implementations of routing optimization, Markov Chains *pandas* analysis of network experimental data, packet captures, Matlab LTE, 5G and Control System Toolbox experience, Java and Python OOP experience

ONGOING PROJECTS

On Packet Reordering and TCP Resilience to Packet Reordering

I am working on (i) obtaining analytical bounds for tolerability of packet reordering under time-based loss detection methods, (ii) testing TCP tolerance to packet reordering under wireless and multipath scenarios.

On Learning Methods for AQM Type Detection

With my collegues at NYU, we are working on exploring statistical and learning based methods for detecting the Active Queuing Management discipline of a TCP flow's bottleneck. We also aim to produce a real time implementation at the Linux kernel.

On Virtual Radio Access Network (vRAN) Availability

With AT&T Labs, We are interested in extending our vRAN/cloud-RAN availability work from Globecom 24' to also capture transport components and better compare centralized vs distributed scenarios.

AWARDS AND RECOGNITIONS

2024 - The Dante Youla Award for Graduate Research Excellence NYU Tandon ECE Dept.

2023 - Best Paper Award IEEE HPSR 2023 Co-Chairs

2022 - Oustanding Innovation Award Nokia Global Student Program

TALKS

Teaching Network Security Through MERIFs MERIF 2024, 9/27/24, Kansas City MO

ACADEMIC ACHIEVEMENTS

Scored in the top 0.25% in the Turkey-wide University Entrance Exam with around 2 Million exam takers.
Awarded Academic Excellence Scholarships waiving tuition of undergraduate studies.
School of Engineering Fellow at NYU Tandon. Covers tuition, health insurance and stipend through PhD.

LANGUAGES

Turkish: Native
English: Fluent
French: Proficient *Delf B2 Certificate*

VOLUNTARY ACTIVITIES

Mentorship to High School Students within NYU Tandon ARISE High School Research Program.

Co-leading of high school FRC robotics team Anatolian Eaglebots 3390. Gave basic coding and electronics trainings for high school students and took part in design and strategy decisions for the team.

Executive Board Membership of Sociology Club for 2.5 years at Bilkent University. Organized conferences, discussion sessions and guided city walks with academics.

Participant and Executive Board Member of Theatre and Improvision Club for 4 years at Bilkent University. Acted in plays and improvisations. Directed an planned numerous improvisation sessions.

PERSONAL TRAITS

Passionate about history, foreign languages and jazz.

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