# UFUK USUBUTUN

ufukusubutun.github.io ⋄ New York NY

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## 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 Semiconductors, Santa Clara CA USA** — June - August 2024
*Switch Architect Engineer Intern*

Worked on the Ultra Ethernet Transport Layer protocol suite. Conducted simulations with proposed UET 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 efficiently solving traffic oblivious flow routing problems using machine learning methods with Murali Kodialam and Tv Lakshman of Bell Labs Core Research. (See publications & awards.)

**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 and Network Modeling & Analysis 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 them with an Extended Kalman Filter model. Collected samples using USRPs and implemented a proof of concept on MATLAB.

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

Development of an OFDM based physical layer cooperative telecommunications simulator on Python for evaluation of proposed relaying schemes while using cyclic delay diversity at the transmitting antennas.

## PUBLICATIONS

**Designing Reliable Virtualized Radio Access Networks** — To appear at 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***

## SKILLS

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|---|---|
| **Related Course Work** | Internet Arch. & Protocols, Network Modeling & Analysis, Probability, Cloud Computing & DCNs, Data Structures & Algorithms, Optimization, Wireless Comms., Machine Learning, Reinforcement Learning & Optimal Control, Network Optimization |
| **Experience With** | TCP Loss Detection Algorithms: particularly RFCs 8985 & 6675, GENI and Cloudlab Network Testbeds, Analysis of Packet Captures Queuing Theory and Markov Chain Modelling, Routing Optimization Problem Formulation and Descent Based Solutions System Availability Modeling, Machine Repair Problems 3GPP Cellular Protocol Stack, RRC Layer Protocols and Procedures |
| **Programming Experience** | *bash* scripting for large scale network experiments, linux kernel patching *pytorch* implementation of constrained routing optimization problems, *pandas* analysis of experimental data, Matlab LTE, 5G and Control System Toolbox experience, Java and Python OOP experience |

## ONGOING PROJECTS

### On Packet Reordering and Time Based Loss Detection

Using our conclusions from HPSR 23', we are interested in (i) obtaining analytical bounds for tolerability of packet reordering under time based methods, (ii) discovering cases of wireless communications and multipath.

### On 5G Radio Resource Control Layer State Space

In continuation of my summer internship work at AT&T Labs, I working to model and optimize the 5G RRC State Space. I am also considering a potential extension to Carrier Aggregation.

### On Oblivious Routing

Using our method from Globecom 23', we are interested in (i) obtaining different ways of solving this problem, (ii) applying this idea to disaster recovery resource provisioning problems under limited network knowledge.

## AWARDS AND RECOGNITIONS

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|---|---|
| **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 |

## 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 *TOEFL Score: 109/120*
**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.