

# UFUK USUBUTUN

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## SUMMARY

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My PhD focuses on the cross-layer analysis and modeling of networking protocols and systems. 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 conduct my experiments on networking testbeds (e.g. Cloudlab, Fabric) and I am experienced with analytical modeling of queuing systems. I am also experienced with network optimization.

## EDUCATION

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**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 Technology, Cracow PL** *February 2018 - July 2018*  
Exchange Student in Electrical Engineering

## EXPERIENCE

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**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 UET transport 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, 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 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

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- 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

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

## SKILLS

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<b>Experience With</b>	<b>Standards:</b> IETF RFCs, 3GPP, Open-RAN, Ultra Ethernet Transport <b>Networking Testbeds and Experimentation:</b> Analysis of Packet Captures <b>System Modeling:</b> Queuing Theory, Markov Chains, TCP Congestion Control Flavors and Loss Detection Algorithms Network Optimization Theory
<b>Related Course Work</b>	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
<b>Programming Experience</b>	<i>bash</i> scripting for large scale network experiments, linux kernel patching Python, Matlab implementations of routing optimization, Markov Chains <i>pandas</i> analysis of network experimental data, packet captures, Matlab LTE, 5G and Control System Toolbox experience, Java and Python OOP experience

## ONGOING PROJECTS

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### 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 5G Dual Connectivity Activation

With AT&T Labs, we are working on developing an analytical model for optimizing Dual-Connectivity activation/deactivation decisions.

### On Learning Methods for AQM Type Detection

With my colleagues at NYU, we are working on exploring statistical and learning based methods for detecting the Active Queueing 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 better active-passive replication.

## 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 - Outstanding Innovation Award** Nokia Global Student Program

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## ACADEMIC ACHIEVEMENTS

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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.

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## LANGUAGES

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**Turkish:** Native  
**English:** Fluent  
**French:** Proficient

*Delf B2 Certificate*

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## VOLUNTARY ACTIVITIES

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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 Improvisation Club for 4 years at Bilkent University. Acted in plays and improvisations. Directed and planned numerous improvisation sessions.

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## PERSONAL TRAITS

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Passionate about history, foreign languages and jazz.