Ufuk Usubutun

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Summary

Ph.D. candidate and network systems engineer with hands-on experience in **cross-layer protocol evaluation and system modeling**. Strong background in **network testbed experimentation, queueing theory, Markov modeling,** and **transport protocols**. Experienced in interpreting **standards** across IETF (wide-area), 3GPP (cellular), and Ultra Ethernet (data-center) ecosystems, and collaborating with AT&T Labs Research and Nokia Bell Labs. (F1 Visa Holder.)

Education

New York University, PhD in Electrical Engineering — Brooklyn, NY — Sept 2020 – May 2026 (Expected)
Supervisor: Prof. Shivendra Panwar

Bilkent University, BSc in Electrical and Electronics Engineering — Ankara, Turkey — Sept 2015 – Jan 2020
Minor in Political Science, Exchange Semester in AGH University, Krakow, Poland — GPA: 3.76/4.0

Experience

New York University, Research Assistant / Fellow — Brooklyn, NY — Sept 2020 – ongoing
- Evaluated TCP resilience to packet reordering through testbed experiments and queuing theory; demonstrated feasibility of per-packet load-balancing over wireless multipath, and of simpler switch designs through relaxation of in-sequence delivery.
- Collaborated with AT&T Labs Research to model reliability bottlenecks of disaggregated RANs, including wireless backhaul, and to optimize activation of 5G dual-connectivity.
- Assisted instruction in graduate courses on Computer Networks and Network Modeling.

Marvell Semiconductor, Switch Architect Engineer Intern — Santa Clara, CA — Jun 2024 – Aug 2024
- Interpreted Ultra Ethernet Transport (UET) standard drafts and delivered technical briefings to the data center switch architecture team.
- Evaluated proposed UET congestion-control protocols through simulations.
- Built Markov models to guide buffer sizing decisions in the Teralynx switch architecture.

AT&T Labs Research, Summer Research Intern — Bedminster, NJ — Jun 2023 - Aug 2023
- Modeled inactivity timer-based 5G RRC state transitions to improve energy efficiency.
- Filed patent covering potential implementations with Open-RAN controllers.

Nokia Bell Labs, Networking Research Intern — Murray Hill, NJ — Jun 2022 - Aug 2022
- Formulated a segment routing (SRv6/MPLS) compatible, traffic oblivious routing problem.
- Implemented a scalable, descent-based algorithm with *pytorch* to solve the problem.

Darkblue Telecommunication Systems, Project Engineer — Ankara, Turkey — Feb 2020 - Aug 2020
- Implemented MATLAB workflow for positioning UAVs using LTE Channel Reference Signals.
- Collected field samples using software-defined radios.

Fraunhofer Institute for Integrated Circuits, Undergraduate Research Intern — Erlangen, Germany — Jun 2019 - Sept 2019
- Developed an OFDM-based cooperative communications simulator in Python.

Technical Skills

Expertise Areas: TCP congestion control and loss detection, queueing theory, standards (IETF RFCs, 3GPP, Ultra Ethernet), Markov modeling, network experiment design.

Programming Experience: Python (pandas, simulation, optimization), Bash scripting for testbeds, MATLAB (Markov modeling), familiarity with Linux TCP internals (net/ipv4), measurement and experimentation with tc, iptables, tshark.

Coursework: Network Modeling, Data-Center Networking, Network Optimization, Machine & Reinforcement Learning.

Publications

Designing Reliable Wireless xHaul for Disaggregated Radio Access Networks – with AT&T (in preparation)
Ufuk Usubutun, Andre Gomes, Shankar P. Narayanan, Matti Hiltunen, Shivendra Panwar

Backbone Switches No Longer Need to Deliver Packets in Sequence IEEE OJCOMS (in review)
Ufuk Usubutun, Fraida Fund, Shivendra Panwar

Modeling and Optimizing Dual-Connectivity Activation in Cellular Networks – with AT&T (in revision)
Caglar Tunc, *Ufuk Usubutun*, Yuxuan Jiang, Shivendra Panwar

Designing Reliable Virtualized Radio Access Networks – with AT&T IEEE Globecom 2024
Ufuk Usubutun, Andre Gomes, Shankar P. Narayanan, Matti Hiltunen, Shivendra Panwar

Oblivious Routing Using Learning Methods – with Nokia Bell Labs 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 Filed Oct 2024
Ufuk Usubutun, Yuxuan Jiang, Caglar Tunc, Xuan Tuyen Tran, Aleksandr Zelezniak, Yu Zhou

Awards & Recognitions

Dante Youla Award for Graduate Research Excellence – NYU ECE Department 2024
Best Paper Award – IEEE Conference on High Performance Switching and Routing 2023
Oustanding Innovation Award – Nokia Global Student Program 2022

Languages

English (Fluent), French (Proficient, DELF B2), Turkish (Native)

Leadership & Service

- Mentor, NYU ARISE High School Research Program – guided student projects involving network testbed experiments.
- Mentor, FRC Robotics Team 3390 Anatolian Eaglebots – taught Java programming to high school students.
- Co-lead, Bilkent Sociology Club - organized seminars, discussion sessions and city walks guided by academics.
- Member, Bilkent Improvisation Club - directed improvisation sessions and performed in them.