Farzad Mohammadi

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Education

- **Electrical and Computer Engineering Department, University of Tehran** — Tehran, Iran
  M.Sc. in Communication Networks - Expected graduation date: Jan 2024 — *2021 - Present*
  - **Dissertation Title**: Digital Twin-Assisted Network Orchestration in Multi-Cloud Networks
  - **Advisor**: Dr. Vahid Shah-Mansouri
  - **GPA**: 19.47/20
  - **Courses**: Distributed Optimization and Learning(19.6/20), Performance Evaluation of Computer Systems(19.5/20), Data Networks(18.25/20), Machine Learning(20/20), Convex Optimization(18.48/20), Advanced Computer Mathematics(19.6/20) , Cellular Networks(20/20), Reinforcement Learning(20/20)

- **Electrical Engineering Department, K. N. Toosi University of Technology** — Tehran, Iran
  B.Sc. in Communication Systems — *2017 - 2021*
  - **Thesis Title**: Design and Implementation of Traffic Grooming Algorithm Based on Hierarchical Clustering and Mid-Grooming for Optical Networks
  - **Advisor**: Dr. Lotfolah Beygi
  - **GPA**: 18.98/20
  - **Selected Courses**: Computer Networks(20/20), Optical Network Design(20/20), Advanced Programming with Java(20/20), Linear Algebra(19.5/20), Signals and Systems(20/20), Digital Communications Systems(20/20), Fundamental Communications Systems(20/20)

Interests

• Computer Networks • Cloud/edge Computing • Large-Scale System Design • Deep Reinforcement Learning (DRL) • Machine Learning (ML)

Skills Summary

- **Programming**: Python (PyTorch, PyTorch Geometric, Networkx, Numpy, Scikit, Flask, FastAPI, Ansible, CVXPY, Stable Baselines), Java, C, Matlab, Bash, VHDL, SQL
- **Technology**: Kubernetes (Helm, Rancher, RKE), Docker(Swarm), Git/Gitlab/Github, IaC (Ansible), Virtualization (ESXi, VirtualBox, VMWare), Redis, RabbitMQ
- **Language**: Persian (native), English (TOEFL Score 113/120 [R30/30, L29/30, S26/30, W28/30])

Publications

- **"Farzad Mohammadi, Vahid Shah-Mansouri, GSC: Generalizable Service Coordination" (to be submitted)**: paper - code

Academic Experience

- **University of Tehran** — Tehran, Iran
  Research Assistant - Dr. Vahid Shah-Mansouri — *Oct 2022 - Present*
  - **Activities**: 1. Literature review on AI-based network and cloud management. 2. Developing Digital Twin (DT) of large-scale networks using Graph Neural Networks (GNNs). 3. Research on the usage of Deep Reinforcement Learning (DRL) algorithms in routing, scheduling, placement, and scalability problems. 4. Supervising two undergraduates to complete their bachelor projects (One of them is a network modeling project and the other one is container scheduling in Fog environments).
  - **Skills**: Python, Docker, Simulation (Simpy), LaTex
- **K. N. Toosi University of Technology** — Tehran, Iran
  Chief Teaching Assistant - Dr. Lotfolah Beygi - Communication Networks Course — *Aug 2021 - Jan 2022*
- **K. N. Toosi University of Technology** — Tehran, Iran
  Research Assistant - Dr. Lotfolah Beygi — *Jul 2019 – Jul 2021*
  - **Activities**: I was a member of a group comprising four undergraduates (including me), three graduate students, and two advisors (Dr. Beygi and Dr. Beiranvand) for two years. We were working on a web-based application named NetPlanner capable of designing many aspects of optical networks. In my first year, I led the backend team. More specifically, I designed and developed the architecture of the backend, REST APIs, and asynchronous processing units and adapted the entire software to be cloud-native (containerization, converting stateful components to stateless units, and handling the networking between services). In my second year, I worked on one of the algorithms for traffic grooming in optical networks (along with two graduate students), which later became my bachelor's project.
  - **Skills**: Python (FastAPI, Celery, NetworkX, SQLAlchemy, Numpy), Docker, Nginx, RabbitMQ
- **K. N. Toosi University of Technology** — Tehran, Iran
  Chief Teaching Assistant - Dr. Zahra Ghatan - Engineering Electromagnetic Course — *Feb 2019 – Feb 2020*

Work Experience

- **Sina Communication Systems, IMS R&D** Tehran, Iran
  DevOps Intern - Part-time *Jul 2021 - Jun 2022*
  - **Responsibilities**: 1. Solving performance and networking challenges in a large-scale application (High availability, scalability, and networking issues in IMS); 2. Building Infrastructure as Code (IaC) using Ansible and bash scripts; 3. Building an automatic testing system for IMS
  - **Skills**: Python, Kubernetes (RKE, Rancher, Harbor, Longhorn), Docker, Kamailio, Ansible, BASH, MariaDB

Honors and Awards

- Ranked 1'st Among All Bachelor Telecommunications Students - Oct 2021
- Ranked 2'nd Among All Bachelor Electrical Engineering Students - Oct 2021
- Accepted Without Exam in MSc Program of University of Tehran as Talented Student - Sep 2021
- Outstanding Academic Achievement for BSc, Academic Year of 2020-2021 (Dean's List) - May 2021
- Outstanding Academic Achievement for BSc, Academic Year of 2019-2020 (Dean's List) - May 2020
- Outstanding Academic Achievement for BSc, Academic Year of 2018-2019 (Dean's List) - May 2019

Selected Projects

- **Java Simulation Toolkit for Queuing Networks**: In this project, I developed based utilities including a statistic collector, an event list, and an event handler to streamline the simulation of queuing networks (Jun 2023 - Jul 2023)
- **Distributed Learning Stack using MPI and PyTorch**: A simple communication protocol using MPI in order to emulate Federated Learning (FL) in resource-constrained situations like edge networks (Nov 2022) - code - report
- **NetPlanner**: Explained in Research Experiences (Jul 2019 - Jul 2021) - code

Volunteer Experience

- **Mentoring high school students to prepare for the university entrance exam (Konkur)** Tehran, Iran
  Helped students organize their studies, and pinpoint their mistakes in math and physics *Sep 2018 - Sep 2019*