Davoud Nosrati

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EDUCATION

BSc in Computer Science — University of Isfahan

Sep 2022 – Jul 2026

- GPA: **18.19/20** · Ranked **2nd of 41** students.
- Coursework (20/20): Principles of Computer Systems, Principles of Operating Systems, Computer Networks, Databases, Machine Learning, Medical Data Mining, Nonlinear Optimization, and Logic and Set Theory.

Diploma — National Organization for Development of Exceptional Talents

Sep 2019 – Jun 2022

- GPA: **19.73/20** · Top **1%** in the National University Entrance Exam.

RESEARCH INTERESTS

- Kernel memory management, address translation, microkernels, IPC, memory virtualization, hardware-assisted virtualization, isolation, profiling, optimization of system software, machine learning, and clustering

SYSTEMS & OS EXPERIENCE

MIT 6.S081 — Operating System Engineering

GitHub

- Completed the **xv6** (**RISC-V**) util, syscall, and **page-table** labs.
- Studied the lectures, readings, and xv6 book chapters, and documented the journey in written notes.
- Wrote Page Tables — What MIT 6.S081 Taught Me, an illustrated guide to multi-level Sv39 page tables.

CPU Simulator — Mano's Basic Computer

GitHub

- Contributed to a **16-bit CPU** simulator with bit-level **registers**, a common bus, an **ALU**, and **hardwired control logic**.
- Tools: **Python**, Django REST Framework, React.

RESEARCH EXPERIENCE

Bachelor's Project — k-means & GLKM Optimization

GitHub

- Supervisor: Dr. Najmeh Hosseini Monjezi, University of Isfahan.
- Evaluated k-means++ warm starts and elbow-based cluster selection, building on the **GLKM** method.
- Tools: **Python**, **C++/Cython**, LaTeX.

TEACHING EXPERIENCE

Principles of Operating Systems

Problem sets · Final project · Spring 2024

- Co-authored **five problem sets** and solutions for Dr. Mojtaba Rafiee's course, covering OS fundamentals, **processes**, IPC, threads, **scheduling**, and **synchronization**. Typeset teaching materials with **LaTeX**.
- Contributed to the **Unix-shell** final project (fork/exec, pipes, pthreads, fork-join) and graded student submissions.

Data Structures & Algorithms

Fall 2023

- Led **TA lecture** sessions and designed problem sets for the course, compiled in LaTeX.

PROFESSIONAL EXPERIENCE

IT Assistant — IPM, Isfahan

Nov 2024 – Apr 2025

- Administered **Linux servers** and resolved **network** connectivity issues.

Backend Developer — Paya Software, Isfahan

Jun – Oct 2024

- Developed a business simulation platform with **Django**, **PostgreSQL**, and **Docker** in a team of five (**Git**/GitLab, Jira).
- Implemented **REST APIs** and **JWT** authentication; resolved **N+1** query problems.

Junior IT Support Technician — Computer Science Dept.

Nov 2022 – Jun 2024

- Configured and maintained software on **30+ PCs**; trained new student staff and supported faculty.

SOFTWARE PROJECTS

Unif — University LMS Notification System

GitHub

- Built **async web scraping** with **aiohttp** and BeautifulSoup, and scheduled background jobs with **Celery** and Celery Beat.
- Consolidated HTTP requests into shared sessions, reducing task volume by about **90%** (1,400 to ~140 tasks/minute).
- Tools: Django/DRF, **aiohttp**, **Celery**, Redis, Nginx, Docker, **ADRs**.

Notary — Commission Distribution Platform

GitHub

- Integrated **JWT** authentication and email verification using **django-allauth**, with **role-based** access control.
- Tools: Django/DRF, **Next.js**, **Tailwind CSS**, PostgreSQL, Docker.

Thing Detector — Live Object Detection

GitHub

- Collaborated on a browser webcam app that sends JPEG frames over **WebSockets** and returns YOLOv8 detections.
- Ran inference in a **thread pool** and displayed bounding boxes, labels, and class counts in a React interface.
- Tools: Python, **Django Channels**, Redis, **YOLOv8**, OpenCV, **React**.

AWARDS & CERTIFICATIONS

- Among the **top 7** Computer Science projects at the Khwarizmi National Festival for two years. View on Vimeo
- Ranked **3rd** in the Paya National Computer Science Exam.
- **IBM's** Qiskit Global Summer School 2025 — Quantum Excellence. View Certificate
- **CS50's** Introduction to Programming with Python. View Certificate

LEADERSHIP & VOLUNTEERING

Scientific Co-head — AMCSUI

Feb 2024 – Sep 2025

- The Academic Association of Applied Mathematics and Computer Science, University of Isfahan.
- Head of the Code Club.

LaTeX Workshop Instructor

Oct 2024

- Taught **more than 30 students** from BSc to MSc levels.
- Authored technical documentation for **TeX Live** and **VS Code** integration.

IT Assistant — XPCon

Oct 2024

- Developed a **Python** script integrating **Google Sheets** to calculate player scores.

PRESENTATIONS & LEARNING RESOURCES

1's Complement — Why the Carry Goes Back In

GitHub · Slides

- Created an animated presentation proving **end-around carry** in 1's-complement arithmetic through worked examples, **geometric visualizations**, and **case-by-case proofs**. Published interactive slides and a full video.

How Many Bits? — Digits in Any Base

GitHub · Slides

- Showed where the log-based rule of thumb for counting digits breaks, at exact powers of the base, and derived a formula that holds in **every base**. Built with **Manim**, Python, and LaTeX.

TECHNICAL SKILLS & LANGUAGES

Programming Languages: C, Go, Python, JavaScript

Frameworks: Django, FastAPI, Celery, Next.js

Databases: PostgreSQL, MySQL, MongoDB

General & Infrastructure: Linux, Git, Docker, Redis

Scientific: NumPy, scikit-learn, SPSS, Manim, LaTeX

Languages: Persian, English (**TOEFL** 118/120)