

Hossein Aghaei Araei

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Tehran, Iran

EDUCATION

• Sharif University Of Technology (SUT)

Bachelor of Science, Computer Engineering

Sep 2019 - July 2025

Tehran, Iran

- GPA: 19.13/20 (Last 2 years: 19.83/20)

RESEARCH INTEREST

Database & Information System | Software Engineering | Distributed & Operating System

RESEARCH EXPERIENCE

• RADIANT Lab

Research Assistance

Sep 2023 - Present

SUT

- Initiated the **department's first comprehensive project** on databases, focusing on Time-Series databases specifically for IoT applications.
- Conducted a detailed comparison of databases for IoT, identifying the most important feature and limitation of such a database.
- Compiled and analyzed several Time-Series datasets, **profiling IoTDB performance** in a clustered environment, identifying the most biggest bottleneck in the communication.
- Engineered a **custom MQTT data format, reducing energy consumption and network overhead** for IoT devices interfacing with IoTDB.

• Cyber Physical System Lab

Research Assistance

Feb 2024 - Present

SUT

- Developed a generic method to dynamically determine task replica count and mapping in **heterogeneous multi-core processors** to achieve the **six "nines" reliability**, hard real-time constraints, and fault tolerance.
- Translated MiBench benchmark codes to Python and Java, executed them on gem5 x86 and ARM simulators to gather power usage and area metrics, later processed using McPAT.
- Collaborated with Professor Ansari and Dr. Safari on a **comprehensive survey exploring resource-sharing strategies for real-time systems**.

• Setaerh Group

Research Assistance

Jul 2021 - Sep 2021

Tehran, Iran

- Developed a reliable Nugget package to run multiple programming language scripts, such as .NET, Python, R, and Matlab with **extensive data** in a remote **Jupyter Notebook** server.
- Prototyped for several network protocol like HTTP and **WebSocket**.

PROFESSIONAL EXPERIENCE

• Digikala

Senior Software engineer

Jul 2022 - Present

Full-time - Tehran, Iran

- **Member** of the database disaster management team.
- Conduct several **advanced MySQL courses** for about 200 engineers.
- **Lead of the promotion team** for 2 Black Friday campaigns with **800k** online users.
- Develop features on our native framework to **decrease 21%** of Redis queue sizes.
- Develop a micro-service for stock management, handling **distributed transactions and over 50k rps**.

• Mohaymen

Software engineer

Feb 2021 - Nov 2021

Full-time - Tehran, Iran

- Develop a fast multi-operational CSV parser in .NET to read a **4G** file in **8 seconds**.
- Develop a **logging system** to track a request among **different services** with **Decorator Pattern**

HONORS AND AWARDS

- **Ranked 24th**

Aug 2019

Iranian University Entrance Exam

- among 164k students

- **Fastest Promotion Ever**

March 2023

Digikala

- L3 to L4 Level Just in 8 month (Google Ladder)






PUBLICATIONS

- [C.1] A.Ansari, H.Aghaei, M.Ansari. **HAMLET: Adaptive Machine Learning-based Thermal Management in Fault-Tolerant Heterogeneous Multicore Systems**. In *DAC-2024*. (submitted)
- [J.1] H.Aghaei, B.Safaei. **Integrate the IoTDB with different communicating protocols suitable for IoT devices**. (under preparation)

SKILLS

- **Programming Languages:** Java, .NET, Python, Node.js, PHP, C, C++, R, Assembly, Verilog, Bash
- **Web Technologies:** Redis, Memcached, Kafka, Elasticsearch
- **Database Systems:** MySQL, PostgreSQL, MongoDB, IoTDB, InfluxDB
- **DevOps And Version Control:** Git, Gitlab, Docker, CI/CD
- **Operating Systems:** Linux, MacOS, Windows
- **Coding:** SOLID, Test (Unit, Integration), Design Patterns, Agile methodologies, Clean Architecture

PROJECTS

- **Search-Engine: A ML-powered search engine** *Adv Information Retrieval*
Tools: Python, PyTorch, ElasticSearch 
- **Kafka: MVP of the Kafka streaming Platform** *System Analysis And Design*
Tools: Python, JS, Docker 
 - Multiple producers/subscribers And guarantee the exact one recipient.
- **PintOS: A Tiny Operating System** *Operating System*
Tools: C, VM 
 - Features like syscalls, an inode-based filesystem, directories, priority inversion, buffer cache, and locking mechanisms (mutex, semaphore).
- **OnlineTicket: A Web App for online ticketing** *Agile Software Development*
Tools: JS, MongoDB, CI/CD 
 - Full cycle of the software with Agile methodologies (Kanban) and practices
- **MIPS: MIPS Processor** *Digital Systems Design*
Tools: Verilog 
 - A full-pipelined MIPS Processor with an LRU cache.

RELATED COURSES

Database Design | Essentials of Prompt Engineering | Agile Software Development | Software Engineering | System Analysis & Design | Operating System | Blockchain Scalability

TEACHING AND MENTORING EXPERIENCE

- **Teaching Assistance:** Technical Presentation (7x) | Database Design (2x, 1x as the **Head**) | Linear algebra (1x) | Basic programming (2x) | Software Engineering (1x as the **Head**) | ADV information retrieval (1x)
- **Leadership:** Organize an study group (ALPHA), **lead 7 teachers and consultants**, webinar for more than **2000 students**.
- **Teaching:** Teaching Chemistry and Math in ALPHA to more than **1000 students** from 2019.
- **Book:** Edit **7 books and Author of a book** in Chemistry for the university entrance exam- Konkur.

ADDITIONAL INFORMATION

Languages: Persian (Native), TOEFL iBT 103/120 (R: 30, L: 28, S: 22, W: 23)