Ahmad Khan

ahmadkhan.dev | +41762681858 | ahkhan@student.ethz.ch

EDUCATION

ETH Zürich   Expected Graduation: Aug 2025
Master of Science in Computer Science
Specialization in Machine Intelligence (AI)
Relevant Courses: Probabilistic AI, NLP, Big Data
Upcoming Courses: LLMs, Foundation of RL, Computational Semantics, Interactive AI, Computational Intelligence Lab

Carnegie Mellon University   2021
Bachelor of Science in Computer Science   **GPA: 3.93**
Minor in Business Administration
Awarded Qatar Foundation Scholarship

WORK EXPERIENCE

QATAR COMPUTING RESEARCH INSTITUTE | SOFTWARE ENGINEER | NOVEMBER 2021 – SEPTEMBER 2023
Allama: GPT based chatbot using Langchain on Qatar ministry data
- Set up a pipeline to automatically crawl, parse and embed data to keep chatbot up to date.
- Set up CI/CD using Azure Pipelines and Docker Swarm.
- Developed miscellaneous front-end features with Angular.

JUDO: Web-based interactive traffic microsimulation based on SUMO/QarSUMO
- Set up web based visualization of SUMO simulations, including various performance improvements such as visual clustering of vehicles, frame dropping, and intelligent memory management to avoid buffering.
- Dockerized QarSUMO and created an API to access it in order to ease deployment and scalability.

SIHA: platform to extract, unify, and provide health data from various wearable devices
- Refactored stale flutter code for SIHA mobile app, including migration to null-safety and BLOC architecture pattern.
- Developed new Team Competitions feature, which included the design of DB models, implementation of Flutter screens, API endpoints, and background services to log leaderboards and update user points when a competition ends.
- Implemented a YAML specification for TASRIF that converts YAML to python code to make TASRIF more accessible to users with less coding familiarity.
- Created an on-premise deployment script for SIHA that pulls all the relevant images from MS azure. This removes the need to manually pull images and leaves no sensitive code at the deployment site.
- Mentored 2 batches of interns over a 3 month period each.

QUICKBYTE | SOFTWARE ENGINEER INTERN | DECEMBER 2020 – JUNE 2021
- Created an admin dashboard for managing restaurants and menus using React and NodeJS.
- Added features and bug fixes on the the mobile app using React Native.
- Created indexes in MongoDB to optimize DB queries.

CARNEGIE MELLON UNIVERSITY | COURSE ASSISTANT | AUGUST 2020 – DECEMBER 2020
- 15-451 Design and Analysis of Algorithms, 02-250 Introduction to Computational Biology
- Graded assignments, conducted recitations, and held office hours

CARNEGIE MELLON UNIVERSITY | UNDERGRADUATE RESEARCH ASSISTANT | OCTOBER 2018 – AUGUST 2020
- Worked under Professor Ihab Younis, filling computaional biology support for various projects and students under the lab.
- Built a dashboard for visualizing data generated from breast cancer databases using React, NodeJS and MongoDB. The dashboard was part of a deliverable for the lab's research grant.
- Compiled a database on Minor Intron Containing Genes (MIGs) to help investigate their role in regulating oncogenes. This includes computational prediction of how minor intron retention impacts protein synthesis using an automated process which generated reliable data, as opposed to traditional biology methods which are error-prone and time-consuming.
- Developed an RNA-Seq pipeline using Nextflow that performs read alignment, mapping, and calculates gene abundance for analyzing lab-generated data.

AWARDS

- **Andrew Carnegie Society Scholar** – awarded to select top students of each graduating class   2021
- **Qatar Campus Scholar** – awarded to top student from each major in the Qatar campus   2021
- **Student Leadership award with distinction** – awarded to 4 students in each graduating class   2021
- Best Design award in CarnegieApps Hackathon   2020
- First Place in Oman Collegiate Programming Competition   2019
- First Place in CMUQ Programming Competition   2019
- First Place in Qatar University Cybersecurity Competition organized by Thales   2019

- Best Technology award in CarnegieApps Hackathon   2018
- Dean's Honors List   All Semesters

PROJECTS

PEER-TO-PEER FILE-TRANSFER SYSTEM IN C
- Designed a bit-torrent like file transfer application that runs on top of UDP, implementing (TCP like) reliability, concurrency and congestion control.
- Concurrent file download and upload is achieved by splitting files into chunks.
- Congestion control is achieved using slow start, congestion avoidance (AIMD), and fast retransmit.

THEOREM PROVER IN SML
- Implemented a proof search procedure for constructive logic in G4ip calculus.
- Achieved by avoiding non-invertible rules until applicable invertible rules are exhausted, then considering all possible choices among non-invertible rules.

VIDEO CDN IN C
- Created a video content distribution network with adaptive bitrate selection, DNS load balancing, and a part of OSPF.
- HTTP Proxy intercepts GET requests created by the video player and modifies them to fetch an adapted bitrate depending on calculated network throughput.
- DNS load balancing is implemented through round-robin and shortest geographic distance.

DOMAIN INDEPENDENT PLANNER IN SML
- Built a planner that uses Depth First Search or Breadth First Search to find a path to a given goal state using a given domain, start states and rules.
- This can be used to solve games, navigation, or resource allocation problems.

LEADERSHIP

HEAD ORIENTATION COUNSELOR FOR STUDENT EXPERIENCE | JUNE 2020 – AUGUST 2020
- Crafted an orientation program to provide incoming students with the resources needed to succeed at CMUQ.
- Collaborated with other Qatar Foundation universities to hold orientation events across universities for the first time, aimed at forming a community for the students in student housing.
- Introduced Tartan Bridge Buddies, a program that aims to build a 1:1 connection between first-year students and upperclassmen to aid transition into CMUQ.
- Lead online social events to create a sense of belonging within the CMUQ community among first-year students.
- Planned training sessions for 70 Orientation volunteers centered on diversity and inclusion.

COMPUTING CLUB PRESIDENT (CS DEPARTMENT CLUB) | AUGUST 2019 – MAY 2020
- Organized Alumni talks to introduce CS students to career opportunities and advice.
- Organized social events to improve community within the CS department.
- Facilitated a GameDev Hackathon in collaboration with Alumni.

TRIP LEADER FOR ENVIRONMENTAL SERVICE PROJECT IN BALI | SEPTEMBER 2019 – MARCH 2020
- Selected to manage a budget of approximately $22k to lead a service-learning project for 9 students under the Tartans Without Borders (TWB) initiative.
- Structured a full environmental education program for children in Bali to raise awareness regarding environmental problems, collaborating with an NGO.
- Designed an equitable application process and conducted interviews to select students for the project.
- Ran campaigns to engage the community with our project and environmental issues. There were 60 applicants to the project, which was the highest number of applicants to a TWB project.
- Led predeparture team meetings to discuss volunteerism vs voluntourism, environmental issues, and teaching technique.
- Developed student leaders for environmental advocacy in CMU and planned an environmental campaign for CMU.

THOUGHT CLUB VICE PRESIDENT | AUGUST 2019 – MAY 2020
- Facilitated discussions among the CMUQ community to discuss meaningful topics to learn different perspectives and to think about the world in a broader sense beyond personal bubbles.

EXTRACURRICULARS

CIVIC ENGAGEMENT
- Service project volunteer in Sri Lanka, Cambodia, Morocco

COMMUNITY SERVICE
- Campus Climate Committee member (committee for tackling student issues on campus)
- CMU Experience mentor and Marhaba Tartans volunteer (various CMU outreach programs)

SPORTS
- CMUQ basketball and volleyball teams – 2nd place in Education City with both teams
- Brazilian Jiu Jitsu white belt 2 stripe :)