Muhammad Khalid

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EDUCATION

University of Iowa — Iowa City, IA
*Accelerated **M.S.** in **Computer Science*** — *Expected Graduation - 2027*

Grinnell College — Grinnell, IA
B.A.** in **Computer Science — *Expected Graduation - 2026*
- Cumulative GPA: 3.7/4.0, In-major GPA: 3.75/4.0, Deans list all semesters
- Selected Coursework: Computational Methods, Software Design & Development, Operating Systems & Parallel Algorithms, Data Structures & Algorithms, Object-Oriented Programming, Linear Algebra

EXPERIENCE

Lead Developer, PioneerMart — Jan. 2025 – present
Grinnell College — *Grinnell, IA*
- Led **4 developers** to build & maintain an **online marketplace app** for Grinnell students using **agile** methodologies and **CI/CD** pipelines
- Implemented **automated image/text moderation**, **real-time chat**, **OTP auth**, and **AWS S3** file storage
- Drove user growth to **300+ active users** in **1 week** through campus outreach and rapid iteration

Research Assistant — May 2024 – Dec 2024
ELBICA Lab, Grinnell College — *Grinnell, IA*
- Developed **python** software to integrate visual and verbal data stored using **distributed representations**
- Implemented **causal inference** models to guide **decision-making** based on analyzed data
- Utilized **OpenCV** to break down parts of 2-D graphs to be used for inference

Software Developer, Intern — June 2023 – Aug. 2023
10Pearls — *Karachi, Pakistan*
- Developed a full-stack fitness-tracking application using **Flask REST** with **JavaScript** & **PostgreSQL**
- Implemented **Flask authentication** with password hashing for secure user accounts
- Leveraged **SQLAlchemy ORM** resulting in **40% less code** & improved query performance

PROJECTS

MCMC Cipher Cracker | *AWS Lambda, Python, Next.js, TypeScript* — August 2024
- Developed a **full-stack** web app to crack substitution ciphers using an **AWS Lambda backend** and **API Gateway** with a **Next.js** frontend
- Implemented an **MCMC-sampling algorithm** with custom acceptance probability & cipher space exploration
- Leveraged concurrent **Lambda invocations** and **ChatGPT API** to select the most accurate deciphered message

GPU Sudoku Solver | *C, CUDA* — November 2024
- Leveraged **GPU** parallelization & bit manipulation to solve **1,750,000+** sudoku boards per second
- Utilized **thread synchronization** and **constraint propagation** to validate cells for each board

EXTRACURRICULAR EXPERIENCE

Pioneer Weekend — September 2023
Grinnell College — *Grinnell, IA*
- Designed an **app** to reduce college waste with **automated listings** via the **ChatGPT API**, winning **$900**
- Collaborated w/ a team of **3 developers** to present an **MVP** to a panel of **entrepreneurs** & **college president**

MSA President — Aug. 2024 – present
Grinnell College — *Grinnell, IA*
- Lead the Muslim Student Association w/ an **$11000+** annual operating budget and **70+** active student members
- Organize regular events on campus through collaborative initiatives w/ other organizations

TECHNICAL SKILLS

Proficient: Python, JavaScript, TypeScript, Next.js, Django, React, React Native, Expo
Familiar: PostgreSQL, Jest, Zustand, C, Java, Flask
Cloud & DevOps: AWS (Lambda, S3, EC2, API Gateway), Git, GitHub, linux, CI/CD, Nginx