

# Muhammad Khalid

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## EDUCATION

### University of Iowa

Iowa City, IA

Accelerated **M.S. in Computer Science**

Expected Graduation - 2027

- Accepted into competitive undergraduate to graduate program

### 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** workflows
- 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, TypeScript, Next.js, Django, React, React Native, Expo

**Familiar:** AWS, PostgreSQL, Nginx, Jest, Zustand, C, Java, Flask