

Muhammad Khalid

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EDUCATION

Grinnell College

Grinnell, IA

Major in *Computer Science*

Expected Graduation - 2026

- Cumulative GPA: 3.67/4.0, In-major GPA: 3.73/4.0, Deans list Spring 2023 & Fall 2023
- Selected Coursework: Software Design & Development (ongoing), Computational Methods, Operating Systems & Parallel Algorithms, Data Structures and Algorithms, Object-Oriented Programming, Data Science, Statistical Modeling, Linear Algebra

EXPERIENCE

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
- Implemented **SQLAlchemy ORM** for database abstraction resulting in 40% less code & improved query performance

Computer Science Grader

Sep. 2023 – Dec 2024

Grinnell College

Grinnell, IA

- Graded **40+** weekly labs, reading assignments, and projects in **Java** (DSA), **Racket** (Functional Programming)
- **Debugged** code written by students, providing detailed feedback
- Reported student difficulties in weekly meetings to improve teaching methods and course structure

PROJECTS

MCMC Cipher Cracker | *Python, Next.js, Django, Typescript*

August 2024

- Developed a **full-stack** web app to crack substitution ciphers using **Django REST** with **Next.js** as the frontend
- Implemented an **MCMC-sampling algorithm** w/ custom acceptance probability & cipher space exploration
- Integrated a pre-trained **GPT-2 model** & Python's **multiprocessing** library to bypass sampling limitations

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** for an **online college marketplace** w/ an **automated item listing** feature, 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, C, Java, R

Familiar: PostgreSQL, Pandas, Flask, NumPy, OpenCV, RShiny