Muhammad Khalid

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EXPERIENCE

Research Assistant   May 2024 – Present
ELBICA Lab, Grinnell College   *Grinnell, IA*
- Developed **python** software to integrate visual and verbal data stored using **distributed representations**
- Implemented a **causal inference** model 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
- Utilized **pandas** and **Scikit-learn** to process data and derive insights

Computer Science Grader   Sep. 2023 – Present
Grinnell College   *Grinnell, IA*
- Grade **40+** weekly labs, reading assignments, and projects in **Java** (DSA), **Racket** (Functional Programming)
- **Debug** code written by students, providing detailed feedback
- Report student difficulties in weekly meetings to improve teaching methods and course structure

PROJECTS

MCMC Cipher Cracker | *Python, Django, Next.js, Typescript*   August 2024
- Developed a **full-stack** Cipher Cracker using **Django REST** with **Next.js** as the frontend
- Implemented a version of the **Metropolis-Hastings** Algorithm with to determine the best reverse cipher

Gradient Descent | *Python, NumPy, Matplotlib*   February 2024
- Implemented optimization algorithms using **Gradient Descent** with adaptive step size, contraction factors & **Newton-Raphson** methods to minimize multivariate functions
- Utilized **NumPy** & **Matplotlib** to implement & analyze numerical methods with matrix operations

EDUCATION

Grinnell College   Grinnell, IA
*Major in **Computer Science***   *Expected Graduation - 2026*
- Cumulative GPA: 3.62/4.0, In-major GPA: 3.75/4.0, Deans list Spring 2023 & Fall 2023
- Selected Coursework: Computational Methods, Operating Systems, Data Structures and Algorithms, Object-Oriented Programming, Data Science, Linear Algebra

EXTRACURRICULAR EXPERIENCE

Pioneer Weekend   September 2023
Grinnell College   *Grinnell, IA*
- Developed an **app** to **automate** the item listing process for a college-centric **online marketplace**, winning **$900**
- Collaborated with a team of developers to create a **functional prototype**

HackGC   April 2023
Grinnell College   *Grinnell, IA*
- Won **2nd place** at a hackathon focused on using technology to fight climate change
- Designed an **online platform** as an MVP to connect users & restaurants with a team of 4

TECHNICAL SKILLS

Proficient: Python, Next.js, Typescript, Django, React, Java, Javascript, C
Familiar: PostgreSQL, Tailwind, R, Flask, Pandas, NumPy, OpenCV, NetworkX