Muhammad Abdullah Goher

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EDUCATION

University of Pennsylvania, School of Engineering and Applied Science — **Philadelphia, PA**
Bachelor of Science in Engineering in Computer Science — **May 2027**
Concentration: Artificial Intelligence — **GPA: 3.65**

Coursework: Data Structures, Algorithms and Analysis, Big Data Analytics, Introduction to Artificial Intelligence, Linear Algebra, Computer Systems, Automata Complexity, Computational Mathematics, Software Design/Development

TECHNICAL SKILLS

Programming: Java, C, JavaScript, Python, TypeScript
Tools & Frameworks: Vite + ReactJS, Express, Node,js, Pandas, PyTorch, Matplotlib, SQL, HTML/CSS, Git/GitHub

PROFESSIONAL EXPERIENCE

Computational Social Science Lab — **Philadelphia, PA**
Research Assistant — ***May 2025 - Present***

- Engineered a full-stack "human-mobility hub" (ReactJS + Vite, Node.js, MongoDB) with 90 % end-to-end Cypress test coverage, ensuring reliable data ingestion and search
- Designed a custom Retrieval-Augmented Generation pipeline, fine-tuning domain-specific LLMs and crafting optimized prompts to deliver fast, context-aware answers to research queries
- Hosted a large datsaet of human mobility on AWS S3, generated dense vector embeddings, and deployed on Qdrant for low-latency semantic search across the archive

Children Hospital of Philadelphia — **Philadelphia, PA**
Full Stack Developer — ***Nov 2024 - Present***

- Co-developed a web platform for autism-research data management using ReactJS (Vite), Django, and FastAPI, improving data accessibility for 25 + clinicians
- Designed and optimized user interfaces using react-redux and tailwind, including a responsive dashboard and data entry forms (editing, deleting, and new entries) to streamline workflows for researchers and clinicians
- Implemented secure, stateless authentication (JWT in HTTP-only cookies) and context-based data fetching for personalized researcher views

Penn Assistive Devices and Prosthetic Technologies — **Philadelphia, PA**
Machine Learning Engineer — ***Sep 2024 - Present***

- Collaborated in a team of 6 people to develop a computer vision model for detecting and identifying surgical tools in real-time during procedures, aiming to enhance surgical precision and safety
- Curated custom dataset working with Penn Med surgeons and trained deep CNN and Vision transformer model using PyTorch on Kaggle and custom datasets with over 10,000 images
- Fine-tuned model weights through iterative training and optimization techniques, achieving 90% accuracy in detecting and classifying surgical tools across varying angles

Clab AI — **Hybrid (Nashville & Remote)**
Machine Learning Engineer Intern — ***May - Aug 2024***

- Built an AI-powered admissions assistant now used by 100 + students; performed EDA on 100 + university common dataset to uncover trends in financial-aid awards
- Developed Random-Forest and Linear-Regression models (with hyper-parameter tuning) that predict individual aid eligibility with 82 % R^2 on validation data
- Automated data-pipeline ETL scripts in Pandas/NumPy, cutting preprocessing time from hours to minutes

PROJECTS

Compiler Developer - J to RISC-V Translator in C

- Implemented jc, a compiler that translates a stack-oriented language (J) to RISC-V assembly, adhering to standard calling conventions for interoperability
- Wrote a modular token-parsing subsystem (token.h, token.c) and generated assembly for arithmetic, logical, and stack operations
- Built a decoder that converts the emitted RISC-V assembly into binary machine code, allowing the output to be directly executed by a compiler