Meraj Khan

mohammed.m.khan@vanderbilt.edu ❖ (224) 539-7209 ❖ LinkedIn ❖ GitHub

EDUCATION

Vanderbilt University **August 2021 - May 2026**
BS + MS in Computer Science Accelerated Program *Nashville, TN*
Triple Major: Computer Science, Physics, Math *GPA: 3.74/4.00*

- Relevant Courses: Autonomous Vehicles, Data Structures and Algorithms, Intermediate Software Design, Discrete Structures, Digital Systems, Operating Systems, Probability and Statistics, Machine Learning, Compiler Theory, Database and Distributed Systems

SKILLS

- Programming Languages: Java, Python, C++, C, Go, JavaScript, Kotlin, SQL, MySQL, TypeScript
- Development & Frameworks: Express.js, React, Dash, RESTful Services, AWS, MongoDB, DynamoDB, GraphQL, gRPC, Protobuf
- Machine Learning & Data Analysis: TensorFlow, Neural Network Architectures, ML Optimization Techniques
- Software & Tools: Git, Linux, ROS, CAN Data, Matlab Simulink, Tableau, Docker

PROFESSIONAL EXPERIENCE

Tesla **January 2025 - March 2025**
Incoming Software Engineer Intern *Palo Alto, CA*

Coinbase **May 2024 - August 2024**
Software Engineer Intern, Risk Platform Team *Mountain View, CA*

- Designed and implemented a machine learning-based anomaly detection system using XGBoost and Isolation Forest algorithms, reducing false-positive alerts by 30% and improving fraud detection accuracy
- Developed and deployed a real-time risk scoring model with TensorFlow, incorporating LSTM networks for time-series analysis, achieving a 20% increase in predictive accuracy
- Streamlined model deployment using Docker, Kubernetes, and AWS SageMaker, reducing model inference time by 40%
- Established continuous integration pipelines for model retraining and evaluation, using AWS Lambda and S3 to automate updates based on new data, maintaining a high level of predictive accuracy

General Motors **May 2023 - August 2023**
Software Engineering Intern, Ultifi Over The Air Team *Warren, MI*

- Implemented software improvements in Android Automotive, estimated to save $1.5 million/year by increasing update speeds by 30% and introducing modular updates in APEX, reducing bandwidth and server load, and accelerating the delivery of critical bug fixes
- Developed Java/Kotlin code for seamless APEX software updates from GM's back office to vehicles' Android Infotainment Systems
- Eliminated the need for system-wide updates by packaging GM's components into APEX file format, identifying 10 use cases through independent research, and allowing modularized software updates for each OS component

NANOGrav Lab, Vanderbilt University **January 2024 - Present**
Research Assistant, Gravitational Wave Research *Nashville, TN*

- Pioneered enhancements in 'ceffyl', a Python library for gravitational wave research, boosting data analysis throughput by 50%.
- Contributed to the verification of 'ceffyl' across diverse datasets, ensuring robustness in the detection of the gravitational wave background, anticipated to culminate in a groundbreaking publication with Professor Stephen Taylor

Vanderbilt University **November 2023 - Present**
Operating Systems Teaching Assistant *Nashville, TN*

- Communicating OS concepts to a class of 200 students through office hours, code reviewing 5 students per week on C/C++ assignments

ChangePlusPlus **September 2023 - May 2024**
Software Engineer *Nashville, TN*

- Developed loan management software in a team of 5 people using MERN for a nonprofit organization, serving around 3000 people

Institute for Software Integrated Systems, Vanderbilt University **June 2022 - August 2022**
Software Engineer Intern *Nashville, TN*

- Automated data pre-processing for ML model training by developing Python software, increasing training speed by 75%
- Conducted performance assessment of assurance monitors on ML models with out-of-distribution data, utilizing libraries like Pandas and Matplotlib for data management and analysis, helping identify and improve assurance monitor detection performance by 37%
- Leveraged TensorFlow to analyze the Ford AV dataset (ROS data) to predict steering angle changes from sensor input

PROJECTS & OPEN SOURCE CONTRIBUTIONS

- **Fillit Jobs:** Innovated and founded an AI-driven platform for streamlined job applications via a Chrome extension, reducing application times by 80% in user testing. Secured NSF microgrant in Vanderbilt's competitive Ideator program alongside VC interest.
  Custom 32-bit Operating System: Engineered a 32-bit operating system from the ground up using Assembly and C, incorporating features like paging and robust memory management, and designed the system to support concurrency supporting multithreading

AWARDS & HONORS

- Team secured 12th place out of ~10,000 teams in IMC's global trading challenge (IMC Prosperity 2024)
- Bronze Honor International Youth Math Challenge (2021)
- Ranked #1 internationally in Physics (IGCSE 2020)
- Ranked #1 internationally in IT (IGCSE 2020)