Nibraas Khan

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Education

Vanderbilt University, PhD in Computer Science, Disseration: xAI for Wearable Systems: Predicting Behaviors, Monitoring Cognition, and Enhancing Performance — Expected December 2025

Vanderbilt University, MS in Computer Science — August 2020 – May 2023

Middle Tennessee State University, BS in Computer Science — August 2017 – May 2020

Experience

Research Assistant, Vanderbilt University – Nashville, TN — August 2020 – Present

- Engineering a sports analytics platform with IMUs, insole sensors, and ML, automating biomechanical concept extraction for LLM-generated feedback. Applied to 100+ athletes, improving technique retention by 30%.
- Designing an explainable AI system for behavioral prediction in Autism Spectrum Disorder, integrating automatic concept recognition across 25 participants, achieving a 90% accuracy.
- Developing ML pipelines for gait analysis in Mild Cognitive Impairment, using automatic concept recognition on 50+ biomechanical features from 30 participants to identify gait differences between MCI and non-MCI.
- Collaborating with Vanderbilt's venture team to explore commercialization, conducting 50+ customer discovery interviews. Initiated patent filings and secured $100K in funding to assess market viability.
- Built web and mobile apps with React Native, interfacing with 5+ bluetooth devices (100Hz), 2 TCP sensors (100Hz), and 1 audio sensor to deliver ML predictions in real time, sending feedback directly to an Apple Watch.
- Developed a commercialization-ready universal data coding platform for labeling and analytics, streamlining dataset curation. Now being adopted by other labs to enhance research workflows.
- Created interactive dashboards for clinical, non-technical teams, visualizing real-time sensor data and ML predictions across 100+ sessions, improving stakeholder transparency and reducing analysis time by 40%.

Co-Founder, JumpStart – Nashville, TN — January 2023 – Present

- Co-founded a nonprofit mentoring 20+ students across 5+ universities, providing structured development opportunities and connecting them with product owners to build 3+ production-ready apps.
- Helped students gain real-world experience in full-stack development, cloud computing, and agile workflows, leading to successful careers in software engineering, game development, and research.
- Managed program logistics to enhance operational efficiency and foster better engagement between students and business partners to ensure effective collaboration and project execution.

Projects

Algorithmic Trading — April 2020 – Present

- Developing momentum-based and mean-reversion trading algorithms on QuantConnect, leveraging Python for backtesting and optimizing execution with multithreading. Achieved a 15% return over six months.
- Building an automated portfolio rebalancing pipeline with QuantConnect's API, integrating machine learning models for volatility forecasting and real-time asset allocation adjustments.

Funding

Grants: NIH (Social Robotics) - $3.13M, NSF (Compression Tech, Pending) - $2M, NSF (AI for Behavior Prediction) - $1.1M, NSF I-Corps (Pending) - $50K, Microgrant - $2.5K

Technologies

Languages: Python, JavaScript, Typescript, C++, SQL, MATLAB, Swift, C#
Technologies: TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, SciPy, React, React Native, Docker, Git, QuantConnect, Firebase, AWS, Jupyter Notebooks