Shreyas Pradeepkumar Khandale

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Education

State University of New York, Binghamton **Aug 2024 – May 2026**
Master of Science in Computer Science *GPA: 3.7*

- Relevant Coursework: Artificial Intelligence, Machine Learning, Design and Analysis of Algorithms, Programming Languages, Data Mining, Systems Programming, Web Programming, Computer Vision

AISSMS College of Engineering **Feb 2021 – May 2024**
Bachelor of Engineering in Computer Engineering *GPA: 3.5*

- Relevant Coursework: Cloud Computing, Cyber Security, Blockchain Technology, Computer Networks and Security, High-Performance Computing, Deep Learning, Natural Language Processing, Business Intelligence

Skills

- **Languages:** Python, C++, JavaScript, Typescript, PHP, SQL (MySQL, PostgreSQL), HTML, CSS, Java
- **Softwares & Operating Systems:** TensorFlow, Keras, OpenCV, NumPy, Pandas, SciPy, Scikit-Learn, XGBoost, JDBC, NetBeans IDE, phpMyAdmin, XAMPP, Apache, Microsoft Azure, LoRaWAN, NFC, The Things Network (TTN), REST APIs

Experience

Information Technology Services, Binghamton University (New York, USA) **Jan 2025 – Present**
Computer Service Administrator

- Manage and optimize mission-critical **IT infrastructure**, ensuring campus-wide reliability across **AI chatbots**, cloud platforms, server administration, and web services
- Maintain a **configuration-management system** tracking 2,500+ endpoints, 150+ servers, and **10,000+ user records**, with a focus on data accuracy, security, and availability
- Deploy automation pipelines and **AI-driven solutions** (Mongoose chatbot, RESTful APIs, network monitoring) to streamline ticket resolution, asset management, and connectivity across 750+ switches and 400+ access points

Thomas J. Watson College of Engineering and Applied Science (New York, USA) **Jan 2025 – Present**
Digital Twin Technology & Quantum Integration Research Assistant

- Advancing a **Digital Cousin framework** for quantum networks, a scalable alternative to digital twins that integrates **quantum networking, quantum computing, and edge intelligence** for predictive simulation and experiment co-design
- Developing **Quantum AI models** — including **Transformer-based sequence learners**, probabilistic surrogates (Gaussian processes, LSTMs, beta-binomial), and **reinforcement-learning planners** — to replicate photon event statistics, optimize teleportation/purification cycles, and accelerate protocol planning
- Engineering an **AI-driven data pipeline** (outlier removal, normalization, sliding windows) that generates and validates 50k+ photon events, enabling **uncertainty-aware, multi-channel, and multi-node quantum simulations**

AISSMS College of Engineering (Maharashtra, India) **June 2022 – May 2024**
Teaching Assistant

- Assisted Mr. Sumedh Dhengre in the **Data Structures & Algorithms** course, mentoring **150+ undergraduate students** through lectures and **4 weekly lab sessions**; guided projects on linked lists, hashing, graph algorithms, and memory management, and graded 200+ assignments/exams
- Supported Ms. S. S. Kolte in teaching **Cloud Computing**, delivering labs on **AWS, Azure, Docker, Kubernetes**, and IoT–cloud convergence; organized **5+ workshops** and practical sessions on virtualization, cloud security, and distributed storage
- Collaborated with Ms. Neha Rai in the **Artificial Intelligence** course, mentoring **120+ students** on intelligent agents, heuristic and adversarial search, logical inference, and knowledge-based planning; supervised projects, ensuring practical application of AI algorithms to real-world problem domains

Acmegrade (Maharashtra, India) **Dec 2022 – Jan 2023**
Full Stack Development Intern

- Collaborated on **"Equinox Book Store"**, a full-stack web application for online bookstore management; reported directly to Academic Head, **Mr. Challa Rohit**
- Engineered **front-end and back-end modules** using **PHP, MySQL, HTML, CSS, JavaScript**, deployed via **XAMPP/Apache**, with authentication, dynamic catalog browsing, and order management features
- Delivered a **secure and scalable online bookstore**, improving inventory accuracy and reducing manual order tracking effort by **90%**, enhancing both vendor efficiency and customer experience

Certifications

NVIDIA Fundamentals of Accelerated Computing with CUDA C/C++, Stanford University Certification on IOT, Certiproof Professional Certification of Cyber Security, 40 Google Cloud Skill Boosts, IBM Python for Data Science

Projects

Sign Language Recognition: Multi-Modal Deep Learning Framework **Feb 2025 – May 2025**

- **Technologies & Tools Used:** Python, TensorFlow, Keras, OpenCV, NumPy, Matplotlib, Flask, Convolutional Neural Networks (CNN), Data Augmentation, Hyperparameter Tuning
- Developed a **CNN-based sign language recognition model** to classify American Sign Language (ASL) gestures with high accuracy
- Processed and augmented a dataset of **87,000+ images** using rotation, scaling, and flipping techniques to enhance model robustness
- Trained the model with TensorFlow and Keras, applying **hyperparameter tuning and dropout regularization** to reduce overfitting and improve generalization
- Integrated **OpenCV for real-time gesture recognition**, ensuring smooth performance with minimal latency across diverse backgrounds and lighting conditions
- **Results:** Achieved 95% accuracy in ASL gesture classification, improving baseline accuracy by 10%; outperformed traditional LSTMs and CNNs with +2.5% accuracy and +40% faster inference speed. Enabled real-time recognition with latency under 100ms, delivering a seamless and reliable user experience

Advanced Wine Quality Analysis **Feb 2025 – May 2025**

- **Technologies & Tools Used:** Python, Pandas, NumPy, Scikit-Learn, XGBoost, LightGBM, CatBoost, TensorFlow, Keras, Optuna, SHAP, Matplotlib, Seaborn, Plotly, SciPy, ANOVA, RobustScaler, Power Transformation, Stacking Regressor, HistGradientBoosting, Flask
- Implemented **ensemble learning** (Stacking Regressor, HistGradientBoosting) to improve generalization and mitigate bias–variance tradeoff
- Designed a deep learning **MLP-based neural network** using TensorFlow and Keras, optimized with Nadam optimizer and EarlyStopping for stable classification
- Applied **SHAP and Permutation Importance** to identify alcohol content, volatile acidity, and citric acid as primary contributors to wine quality
- Performed **statistical analysis** (ANOVA, correlation analysis, Partial Dependence Plots) to extract insights on chemical composition, enabling wineries to optimize production processes
- **Results:** Achieved 90% accuracy in predicting wine quality; identified alcohol content (38% impact), optimal pH range (3.0–3.4, +0.5 quality points), and sulfur ratio (0.25–0.35) as key factors. Engineered features improved accuracy by 14%, with white wines showing 22% more quality variance than red wines

Hospital Blood Bank Inventory Management System **Dec 2024 – Mar 2025**

- **Technologies & Tools Used:** Java, Java Swing, JavaFX, MySQL/PostgreSQL, JDBC, NetBeans IDE, Apache Ant, Java Development Kit (JDK), phpMyAdmin
- Designed and developed a **Java-based desktop application** for hospital blood bank inventory management, enabling efficient tracking of donations, stock levels, and distributions
- Implemented **Java Swing for GUI design**, JDBC for database connectivity, and MySQL/PostgreSQL for robust donor record management and accurate inventory tracking
- Developed a **reporting and analytics module** to generate donation trends, stock insights, and donor activity reports, supporting data-driven decision-making
- Built and packaged the application using Apache Ant for seamless deployment, with database operations managed through phpMyAdmin
- **Results:** Successfully delivered a scalable and efficient blood bank management system, improving donor tracking, stock utilization, and overall operational efficiency

Smart Bicycle Theft Prevention System **Aug 2024 – Dec 2024**

- **Technologies & Tools Used:** Heltec WiFi LoRa 32 V3, nRF52840, LoRaWAN, NFC, Python, Flask, JavaScript, JSON, The Things Network (TTN), UART, REST APIs
- Developed an **IoT-based bicycle theft prevention system** integrating NFC authentication, LoRaWAN communication, and a web-based tracking interface for real-time monitoring
- Implemented an **NFC-based locking/unlocking mechanism** with secure user authentication and detailed state tracking including date, time, and location metadata
- Designed and tested **LoRaWAN-enabled real-time tracking**, transmitting periodic location updates to TTN and triggering alerts upon unauthorized movement
- Built a **Python Flask web application** with JavaScript, JSON, and REST APIs for visualizing bicycle location and fetching live tracking data. Debugged and optimized **UART communication** between NFC and LoRa devices, resolving data exchange issues and simulating location data for robust system testing
- **Results:** Successfully implemented a secure bicycle tracking system, achieving efficient theft prevention with real-time alerts and continuous location updates