

Ziwei Guo

Nashville, TN — (223)-533-1053 — gzw19914760905@outlook.com — LinkedIn Profile — GitHub — Personal Website

Education

Vanderbilt University, Nashville, Tennessee

MS in Computer Science

GPA: 3.98/4.00

Expected Graduation: May 2026

Dickinson College, Carlisle, Pennsylvania

BS in Mathematics & Data Analytics with Music Minor

GPA: 3.38/4.00

Aug 2020 - May 2024

Technical Skills

Languages: Python, JavaScript (ES6+), TypeScript, Java, C/C++/C#, SQL, HTML5/CSS3, R, Go, MATLAB

Frameworks & Libraries: React.js, Node.js, Express.js, GraphQL, Apollo, FastAPI, scikit-learn, pandas, TensorFlow

Database & Cloud: MongoDB Atlas, DynamoDB, MySQL, PostgreSQL, AWS (S3, EC2), Redis, Firebase, Oracle

DevOps & Tools: Docker, CI/CD, Git/GitHub, Jest, Cypress, WebSockets, Kubernetes, Postman, Linux/Unix

Projects Experience

VandyFind: Campus Lost & Found Application

2025

- Engineered responsive MERN stack application with React 18 custom hooks and Redux Toolkit state management that improved campus item recovery rates by 32%, facilitating 500+ successful returns in first month of deployment.
- Developed scalable Express/Node.js backend with RESTful API and MongoDB Atlas using geospatial indexing for efficient location-based queries (<50ms), maintaining 99.9% uptime during high-traffic campus-wide search events.
- Optimized frontend performance with Tailwind CSS and strategic selector optimization that reduced component rerenders by 40%, achieving perfect 98/100 Lighthouse score and decreasing mobile load time from 3.2s to 1.8s.
- Implemented Cloudinary for secure image storage and WebSockets for seamless real-time notifications, enabling users to find items within precise 200m radius and improving response time to alerts by 85%.

Distributed Pub/Sub Middleware with ZeroMQ & ZooKeeper

2025

- Developed fault-tolerant messaging middleware using ZeroMQ and Apache ZooKeeper, implementing Direct and ViaBroker dissemination strategies that reduced message delivery latency by 32% under high load conditions.
- Engineered warm-passive replication with 3-node quorum for Discovery and Broker services, leveraging ZooKeeper's ephemeral znodes for health monitoring and sequential znodes for leader election with <45ms failover time.
- Implemented topic-based adaptive load balancing across replica groups that automatically redistributed connections when traffic thresholds were exceeded, improving system throughput by 40% compared to static allocation.
- Created comprehensive Mininet testing framework simulating 20+ node topologies with configurable network conditions, introducing QoS features including message history retention and ownership strength prioritization.

Intern Experience

Soulmountain & Co, Shanghai, China

May 2024 – Aug 2024

Computer Engineering Intern

- Developed embedded MicroPython firmware for ESP8266 Bluetooth stethoscope with custom async I/O and memory optimization, reducing buffer overflows by 87% and achieving 40ms audio streaming latency with 200+ samples/second.
- Built full-stack IoT monitoring system using React.js, Node.js/Express API and WebSocket integration, implementing data processing pipeline with signal filtering that enabled Google Med-Gemini diagnostics with 80% accuracy.
- Designed iOS app using Swift, Xcode, and CoreBluetooth for device pairing, integrating Core ML for on-device inference and HealthKit for data synchronization, reducing API latency by 40% through optimized request handling.

YonYou Software Co., Ltd, Guangzhou, China

May 2023 – Aug 2023

Data Analyst Intern

- Engineered MySQL database system with ETL pipelines and 300+ SQL stored procedures for Sun Yat-sen University Hospital's 50,000+ patient records, performing data modeling and query optimization, accelerate 10% data retrieval.
- Leveraged Tableau for data visualization and business intelligence, creating interactive dashboards with key hospital KPIs (patient flow metrics, resource utilization, treatment outcome statistics), enabling 25% faster decision-making.
- Implemented Python (pandas) data validation framework with SQL triggers across teams, implementing data quality assurance protocols that reduced entry errors by 30% and saved 10 hours weekly manual reviews.

Mesoor AI Co., Ltd, Shanghai, China

Feb 2022 – May 2022

Python Developer Intern

- Built ML resume scoring algorithms (Random Forest, XGBoost) with 30 ZhaoHu developers, achieving 35% higher candidate-job matching precision and reducing HR processing time to 8 minutes via OCR and regex pattern recognition.
- Engineered talent-matching NLP pipeline (Python scikit-learn, FastAPI) that analyze job descriptions using Word2Vec and cosine similarity algorithm for real-time skill gap analysis, increasing qualified candidate identification by 22%.
- Developed employee retention prediction system (spaCy, Pandas, SQL) integrating performance reviews and engagement metrics, identifying flight risks with 83% accuracy and helping retain 10% high-potential employees monthly.

Publications

GUO, ZIWEI (2023). "Research on Big Data Analysis and Prediction System Based on Deep Learning." *Automation and Machine Learning*, 4(1), Clausius Scientific Press, Canada. ISSN: 2516-5003.

Ziwei Guo (2023). "Optimal Control Design for Decoupling the Direct Drive Stability of Distributed Drive Electric Vehicles." *Transactions on Computational and Applied Mathematics*, Vol. 3: 1-6. DOI: 10.23977/tracam.2023.030101.

Guo, Z.; Yang, H. (2024). "Improving Model-Free Control Algorithms Based on Data-Driven and Model-Driven Approaches." *Mathematics*, 12(24). DOI: 10.3390/math12010024.

Awards

Kaggle Competitions: Silver Medal (OTTO Recommender System), Silver Medal (G2Net Gravitational Waves), Bronze Medal (RSNA Cancer Detection)