ZETAO WU

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EDUCATION

Brown University — Providence, RI
Sc.B Computer Science & M.S. Computer Science (Concurrent Degree) — **Expected**: May 2027
Relevant Courses: Object-Oriented Programming/Functional Programming, Data Structures and Algorithms, Linear Algebra, Statistics and Probability, Computer Systems, UI/UX Design, Algorithmic Game Theory, Deep Learning, Computer Vision

EXPERIENCE

NASA LunaSCOPE *Software Engineer Intern* — Jan 2025 – Apr 2025
- Developed a real-time web platform **supporting 50+ world-renowned researchers across 20 top institutions** in analyzing lunar surface data, using **Next.js, Node.js, TypeScript, SQL, Firebase,** and **Python**
- Led integration of **cloud databases** and optimized backend **RESTful APIs,** improving **data processing efficiency by 40%** and accelerating research on regolith and lunar volatiles
- Debugged and optimized **SQL database queries** and enhanced site performance, reducing load times by **35%** across **10TB+ of lunar research data** and contributing to **NASA's $7.5M+** exploration initiative
- Integrated a deep learning anomaly detection module using a **ResNet-based autoencoder** in **TensorFlow**, improving detection of irregular terrain features in rover imagery by **67%** precision and reducing false positives by **45%**

CovEducation *Software Engineer Intern* — Oct 2024 – Feb 2025
- Developed & optimized an academic platform system using **Next.js/React.js, Node.js, TypeScript, Mantine,** and **Firebase**, facilitating **100,000+** tutoring hours for **7,000+** students
- Conducted backend **functional testing**, **beta simulations**, and **data analysis**, improving algorithm precision and runtime efficiency by **45%**
- Collaborated in **Agile sprints** with designers and engineers to iterate on features and improve **system efficiency by 30%**, while adhering to clean code standards and best practices
- Enhanced user experience and scalability by **integrating real-time database queries** and **refining UI/UX workflows** using **Figma**, improving tutor-student engagement and satisfaction

NECYSC *Software Engineer Intern* — Aug 2024 – Dec 2024
- Engineered a scalable application management system using **Django**, **Bootstrap**, and **MySQL**, supporting **650+** annual users and streamlining camper registration workflows
- Automated build, testing, and deployment processes via **CI/CD pipelines** with **GitHub Actions** and **Docker** containers**,** achieving smooth **AWS** deployment
- Integrated and developed **RESTful APIs** to enable **1,000+** email/SMS notifications, file uploads, and secure payment processing, resulting in a **75% increase** in registration rates
- Conducted **unit testing**, **functional testing**, and **database integrity validation**, reducing registration system failures by **40%**

DataAnnotationTech *Software Engineer* — May 2024 – Aug 2024
- Optimized **800+ programming prompts** using **Reinforcement Learning from Human Feedback (RLHF),** achieving a **75% increase** in AI accuracy and **65% boost** in user satisfaction
- **Developed domain-specific coding prompts** in **Python, Java, and C**, refining **NLP model** performance and reducing error rates by **35%** through continuous iteration and evaluation
- Built **SQL-backed** data pipelines for **large-scale prompt validation** and **dataset management**
- Conducted **in-depth risk analysis** and **AI model evaluations**, identifying and mitigating **biases**, **hallucinations**, and **inconsistencies**, leading to more reliable AI-generated code suggestions

PROJECTS

Dual-Model Approach to Artist-Conditioned Music Generation *(TensorFlow, Transformer, Stable Diffusion, DDPM)*
- Built a two-stage **generative AI** system: a **Transformer decoder** for artist- and genre-conditioned lyric generation **(95%+ training accuracy)** and a **Conditional U-Net stable diffusion model** for spectrogram synthesis (**train/validation loss <0.05**), with integrated **Dense projections**, **skip connections**, and **noise scheduling** (**DDPM**)
- Developed a modular training pipeline with **dynamic batching**, **custom embedding layers**, **early stopping**, **model checkpointing**, and **automated loss tracking** to optimize training stability and reproducibility

High-Concurrency Database Server with Thread Synchronization *(C, Linux, POSIX Threads, Fine-Grained Locking)*
- Implemented a **multithreaded** key-value database server, enabling **concurrent client connections** over a network using **POSIX threads, fine-grained locking** with read-write locks, and **signal handling**
- Containerized the multithreaded server with **Docker** on **Linux** environments, integrating **thread-safe client synchronization**, **session cancellation handling**, and a **server REPL** for portable deployment, database management, and isolated **CI** testing workflows

SKILLS

Programming Languages: Python, Java, TypeScript, JavaScript, C, C#, HTML/CSS, SQL, ReasonML, DrRacket, .NET
Frameworks & Technologies: React.js, Node.js, Express.js, MongoDB, Redux, TailwindCSS, Flask, TensorFlow, Bootstrap
Development Tools: Git, GitHub, IntelliJ IDEA, Eclipse, VS Code, Visual Studio, Docker, Postman, Figma, Firebase, AWS, Unity