Qiushi Dai

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Education

Rice University Sep 2022 – Present
Bachelors in Computer Science & Statistics *Houston, Texas*

- GPA: 3.96/4.0
- Awards: Louise J. Walsh Merit Scholarship & 4 semesters President Honor Roll
- Clubs: RCSSA Representative, Raw Photography Club
- Publication: "Downscaling Extreme Precipitation with Wasserstein Regularized Diffusion" (IEEE TGRS, 2025)
- Coursework: Computer Vision, Non-Convex Optimization, Machine Learning, Deep Learning, Generative Model, Concurrent Programming, Operating System, Object-oriented Programming, Mixed Integer Programming, Real Analysis

Experience

Bytedance | *Software Development Intern* Jul 2024 – Sep 2024

- Collaborated on an AI-driven A/B testing assistant for the Custom Data Platform (CDP), integrating LLM guidance to automate test configuration and decision-making.
- Contributed to a retrieval-augmented generation (RAG) pipeline for the A/B testing assistant using LangChain, connecting external data sources and leveraging memory modules to store historical test results, reducing hallucinations by 15%.

Bilibili Tech | *Backend Software Developer Intern* May 2024 – Jul 2024

- Engineered a high-performance lottery-draw service using Go and Redis, supporting 50k concurrent users and enhancing scalability.
- Wrote a patent for a scalable instant messaging system using the Kratos micro-service framework, efficiently processing over 1 million messages concurrently.
- Designed and implemented a REST API–driven chat system with an auto-failover Linux SQL cluster in an Agile workflow.

Tesla | *Service Engineering Intern* Dec 2023 – Feb 2024

- Automated the China-market "Christmas" OTA build and deployment in a Kubernetes-based pipeline, replacing region-specific in-car applications (Gaode/Baidu Maps, QQ/NetEase Music) via region flags, with unit tests verifying substitutions before release.
- Contributed to privacy controls by managing sensitive values with Kubernetes Secrets, separating config via ConfigMaps, limiting access to production data, and removing user identifiers from logs.

Rice Apps | *Full Stack Software Engineer* Aug 2024 – Present

- Co-developed BunkMate, a housing search platform for 4,000+ undergrads, using a responsive TS/HTML/CSS front-end and a Node.js/Supabase backend.
- Implemented search features with auto-filters and map integration to enhance user experience, with test coverage over 90%.
- Implemented subscription features with automatic email reminders for favorited listings and soon-to-expire rentals.

Research Experience

Monocular Depth Estimation with Event Stream | *Undergraduate Research Assistant* Jan 2025 – Present

- Developed a latent-space diffusion model for depth prediction from sparse event streams, and currently drafting a first-author research paper under the supervision of Prof. Ashok Veeraraghavan.
- Designed and trained a cross-modal autoencoder that encodes event data and depth maps into a shared latent space using MoE framework, enabling efficient compression and unified representations for downstream diffusion models.
- Mitigated data scarcity by creating a high-resolution synthetic event–depth dataset in CARLA, pre-training on mixed (synthetic + real) data, and evaluating on real-world benchmarks (MVSEC, DSEC).

Generative Precipitation Downscaling Model | *Undergraduate Research Assistant* May 2024 – May 2025

- Collaborated under Prof. Ashok Veeraraghavan's supervision to develop a generative model improving regional precipitation resolution.
- Applied diffusion models to train on low-resolution weather data and generate high-resolution precipitation images.
- Developed a method to seamlessly merge small images during backward inference in the diffusion model, enabling the downscaling model to be applied to larger geographic areas.
- Paper Published on 2025 IEEE Transactions on Geoscience and Remote Sensing (8.6 Impact Factor).

Column Row Sampling in Vision Transformer | *Undergraduate Research Assistant* Nov 2023 – July 2024

- Researched memory-efficient fine-tuning for large language models with Prof. Ben Hu; implemented and evaluated the Winner-Take-All Column-Row Sampling (WTA-CRS) estimator duirng finetuning stage.
- Ran 50+ fine-tuning experiments applying WTA-CRS to vision transformers as a drop-in replacement for general matrix multiplication, assessing peak memory, throughput, and accuracy on image-classification benchmarks.
- Demonstrated peak GPU memory savings during fine-tuning with minimal accuracy impact, and summarized findings to guide model/training configuration choices.

Projects

OwlDB | *Backend Developer* Sep 2023 – Present

- Built a NoSQL database in Go with a RESTful API, and used a concurrent skip-list indexing for efficient searching.
- Ensured integrity and safe concurrency with JSON Schema validation, atomic conditional writes/JSON Patch, goroutines with synchronization, and context-aware timeouts.
- Added production features: token-based authentication with expiring tokens and real-time Server-Sent Events subscriptions for documents and collections.

Skills

Languages: Python, Go, Java, C/C++, R, SQL, HTML, LaTeX, MATLAB, JavaScript/TypeScript
Libraries: PyTorch, NumPy, Pandas, Hydra, PyTorch Lightning, TensorFlow, Scikit-learn, SciPy
Tools: Docker, Linux, Git, Kafka, Kubernetes, Redis, MySQL, MongoDB, Weights & Biases