Eric Xu

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Education

Brown University Providence, RI

BS Computer Science-Applied Mathematics (4.0 GPA) *May 2028*

- Relevant Courses: **(Graduate): Deep Learning, Advanced Topics in DL**, Computer Networks, Computer Systems, ML, NLP, Data Structures and Algorithms, Numerical Optimization, Computational Linear Algebra, Stochastic Processes
- Clubs: Builders Club, Poker Club, APMA DUG, CS DUG, Intramural Basketball, Global Research Consulting
- Honors: AMC 12B: 114/150, D.E. Shaw Connect, Y Combinator Startup School 26, National Merit, Grokathon

Experience

Software Engineering Intern Summer 2026

Capital One *Mclean, VA*

- Building the team's first centralized vulnerability remediation tracking platform for enterprise Kubernetes infrastructure
- Designing Python ETL pipelines and data models to aggregate and analyze Kubernetes vulnerability telemetry across all clusters

Machine Learning Researcher 2025 - Present

Brown University *Providence, RI*

- Introduced a framework for decomposing visual transitions into sparse reusable primitives for latent action learning
- Designed VQ-VAE pipeline patchifying motion inputs and quantizing embeddings into a shared transition codebook
- Built attention-gated factor selection architecture reducing cross-morphology transfer degradation from 58–72% to 20–52%
- Achieved 1.45× downstream policy improvement over previous latent action models in distractor-rich settings

Software Engineering Intern Summer 2025

DrFirst *Atlanta, GA*

- Worked on production healthcare infrastructure and Spring Boot microservices supporting large-scale prescription workflows
- Created team's first regression testing microservice, automating 500+ e-prescription test cases and cutting QA time by 90%
- Implemented robust transaction verification and caching workflows, preventing downstream prescription data corruption

Computational Biology Researcher 2021 - 2025

Emory University School of Medicine, Liang Lab *Atlanta, GA*

- Led a 5-person team on RSV polymerase inhibitor discovery, accelerating virtual screening by 25× across 192 CPU cores
- Developed reusable parallelized Perl/MPI pipelines with BFGS optimization for molecular docking and antiviral screening

Projects

Relay *Emergency Stops and Undo Rollbacks for AI Agents* | 2025 - 2026

- Runtime safety infrastructure for intercepting AI agent tool calls with real-time anomaly detection and rollback mechanisms
- Pretrained LSTM autoencoder on agent traces for behavioral grammar; fine-tuned per-business on shadow logs
- Built hash-linked execution graphs and monitoring pipelines enabling < 5ms anomaly detection and rollback

GUARD *GPU-Native Unsupervised Anomaly and Runtime Drift Monitor* | 2026

- GPU-resident telemetry implementing entropy, KL-divergence, and embedding-drift detectors on PyTorch inference outputs
- Implemented online change-point detection (Page-Hinkley, CUSUM) achieving sub-80-step detection lag at <5% FPR

mimir *Statistically Rigorous Harness for LLM and Policy Evaluation* | 2026

- Python harness that separates real improvements from sampling noise when comparing LLM prompts, models, or seeded policies
- Achieved a true 5% error rate on small-sample A/B tests vs 14% for the standard bootstrap, across $10,000$ simulations

Technical Skills

Languages: Python, Go, C/C++, Java, Perl, JavaScript, TypeScript, SQL
ML/AI: PyTorch, scikit-learn, HuggingFace, CUDA, NumPy, TensorFlow, pandas, Weights & Biases
Infrastructure: Docker, gRPC, Kubernetes, FastAPI, Azure, AWS, Git, PostgreSQL, Redis

Selected Publications

Latent Actions from Factorized Transition Effects under Agent Ambiguity

- Nam, H., Jonnalagadda, C., Aggarwal, H., **Xu, E.**, & Balestriero, R. | *ICML Workshop on Compositional Learning* (AAAI'27 under review) | 2026 | arxiv.org

In Silico Identification and In Vitro Validation of Repurposed Compounds Targeting the RSV Polymerase

- **Xu, E.**, Park, S., Calderon, J., Cao, D., & Liang, B. | *Microorganisms, 11*(6), 1608 | 2023 | doi.org/10.3390/microorganisms11061608