

Rhea Shah

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Education

University of Illinois at Urbana-Champaign, BSE in Computer Science 2029

- **Coursework:** Object Oriented Programming, Machine Learning Seminar, App Development, Discrete Mathematics, Calculus

Skills

Languages: Python, Java, JavaScript, R

ML Engineering: Deep Learning, Transfer Learning, Reinforcement Learning, Feature Engineering, Transformers, CNNs, RNNs, Attention Mechanisms, Distillation, Computer Vision, NLP, Class Imbalance

Libraries & Frameworks: PyTorch, PyTorchLightning, Hugging Face, React, scikit-learn, AutoKeras, auto-sklearn, pandas, NumPy, matplotlib, seaborn, torchvision, TensorFlow, ggplot2

Experience

Computer Vision Research Intern, MIT Lincoln Laboratory August 2024 - June 2025

- Engineered a deep learning pipeline to classify 3D printing failures using a curated 10K-image subset of the CAXTON dataset
- Benchmarked ResNet, ViT, and Swin Models with ResNet50 achieving 89% accuracy; used feature extraction to cut model size by 99.9%
- Resolved data quality issues and conducted model analysis to inform autonomous defect detection in additive manufacturing

NLP Research Intern, MIT Lincoln Laboratory May 2024 - August 2024

- Fine-tuned BERT and integrated SVMs using PyTorch and Hugging Face to build a robust fake news classifier
- Benchmarked CNNs, RNNs, and transformers to optimize performance and generalize misinformation detection across sources

Computational Immunology Intern, Northwestern University May 2023 - August 2023

- Preprocessed and visualized single-cell RNA sequence data in R to identify biomarkers for early diagnosis of GERD and systemic sclerosis
- Trained ML models (CNN, SVM, random forest, logistic regression) on high-dimensional biomedical data, improving diagnostic accuracy

Projects

2024 NeurIPS Spotlight Project: Advancing Diabetic Retinopathy Diagnosis

- Engineered a Vision Transformer in PyTorchLightning for 5-class diabetic retinopathy diagnosis using the RetinaMNIST dataset
- Deployed patch embeddings, self-attention, and positional encoding to capture spatial-retinal patterns with high accuracy
- Surpassed all published benchmarks, including Google AutoML Vision, setting a new state-of-the-art benchmark

Distributed Real-Time Risk Engine for Crypto Derivatives

- Built a real-time risk engine in Rust to compute PnL, exposure, and liquidation metrics for high-frequency crypto derivatives trading
- Integrated Kafka and TimescaleDB to support millisecond latency data ingestion and scalable, time-series risk aggregation
- Deployed Grafana dashboards to monitor system-wide financial health, enabling sub-second insights for automated trading decisions