

LEI FU

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EDUCATION

Purdue University
B.S. Mathematics and Statistics

08/20 - 12/23
GPA: 3.1

EXPERIENCE

Intern - Contractor, U.S. Securities and Exchange Commission

05/22 - 04/24, with breaks

- Developed novel algorithm to fix 100+TB of broken raw OPRA data from CBOE.
- Beat XGBoost and GARCH baselines by $\sim 20\%$ on BTC vol forecasting using novel HMM based algorithm.
- Co-authoring a paper on 0dte option profitability, another on lowering tick-size for index options, with Su Li, Prof. David Muston (Wharton) and Prof. Neil Pearson (UIUC).

PROJECTS (OPEN SOURCE)

Random Access Archive, Code

- Developed custom file format in Rust to store deep learning training data. Supports seamless streaming from cloud. Try it: `pip install rand-archive`
- Achieved a $\sim 80x$ speedup in local dataloading, $\sim 10x$ speedup in cloud dataloading, compared to .tar/Webdataset. Reduced dataset sizes by $\sim 2x$.
- Prevented 7 bugs from being released with unit/integration testing pipeline using Github Actions.

IMC Prosperity Competition, Code

- Ranked top 5% in round one by implementing Avellaneda and Stoikov market-making algorithm.
- Boosted PnL by 22% using Bayesian HPO to optimize algorithm.

huggingface/candle, Code

- Identified and fixed a crucial number generation bug within 3 hours of reporting.
- Made POC for and suggested Optimizer trait, which is now implemented.
- Created `candle-optim`, which contains optimizers like Lamb, AdamW + Amsgrad, and various schedulers.

carton, Code

- Built the world's first and only runtime capable of executing WebAssembly (WASM) ML/AI models locally.
- Enables users to run any model on any system (including browser, IOS, Andriod) with 0 dependencies.

RESEARCH (DEEP LEARNING)

Tradformer, Code

Advisor: Prof. Xiao Wang (Purdue)

- Utilized autoencoder to encode stock returns into a latent space, embeddings exhibited clustering corresponding to industry and sector. Trained LLM to map stock descriptions to embeddings.
- Trained momentum transformer to ~ 2.5 **Sharpe** out of sample, using 8xA100s from Sagemaker.

LQ-ViT, Code

Advisor: Prof. Xiao Wang (Purdue)

- Created novel attention algorithm to reduce redundant tokens in video transformers, targeting publication at CVPR24.
- Training 632M parameter video classification models on TPuv4 using Jax and Equinox.
- Negotiated compute support from Google Cloud, and \$500 from Purdue undergraduate research.

Neural Representation of Volatility Surfaces

Advisor: Prof. Caio Almeida (Princeton)

We are investigating using SIRENs (a CV technique) to fit implied volatility surfaces of options, then mapping them into vectors, to acquire vector representations of IV surfaces. (Recently Started)

SKILLS

Languages: Python, Rust, WASM, Zig, R, C, SQL, Cuda

Python Libraries: PyTorch, JAX, ONNX, TensorRT, Numpy, XGBoost, sklearn, SciPy, FastAPI

Tools: Docker, AWS (Sagemaker, EC2, S3), GCP (TPUs, GCS), Github Actions, Git, L^AT_EX