Albert Chua

636-866-7214 | alchua1996@gmail.com | GitHub | Academic Website | Google Scholar

Professional Experience

Risk/Data Analytics Associate 10/2023 – Present
Global Atlantic Financial Group *New York, NY*

- Refactored daily reporting pipeline and implemented automated reporting system for sidecar investments, reducing runtime by 80% and saving 3 days of manual labor per quarter.
- Sped up firm's MOWQLN optimizer for training LASSO models, reducing training costs from $9000 to $6000 per model.
- Trained and deployed Mutli-Adaptive Regression Spline + LASSO model using hundreds of AWS nodes concurrently in a large shared code base to monitor liquidity risk for approx $35bn in assets.

Risk/Data Analytics Intern 06/2023 – 08/2023
Global Atlantic Financial Group *New York, NY*

- Migrated legacy reporting pipeline (10k lines of code) from SAS to Python, eliminating two days of manual labor per month.
- Created LASSO model to monitor a variable annuity of $20mm in assets w/ high liquidity risk, relative error in surrenders decreased by 33%.
- Built a causal tree via EconML to quantify the effects of COVID and interest rate increases on partial withdrawals.

Data Scientist Intern 06/2022 – 09/2022
Amazon, B2B Payments *Seattle, WA*

- Queried clickstream and payment data in SQL to feature engineer features for a B2B payment fraud dataset.
- Used dataset to create a scalable tree-based model for the payment fraud detection pipeline, leading to a $20mm reduction in fraud losses.
- Implemented a prototype unsupervised clustering algorithm for fraud profiling via K-means and Independent Component Analysis.

Education

Michigan State University East Lansing, MI
PhD in Mathematics, GPA: 3.94/4.0 *2018 – 2023*

- PhD Dissertation: On the Wavelet Scattering Transform and its Generalizations

Missouri University of Science and Technology Rolla, MO
BS in Physics/Applied Mathematics, BA in Economics, GPA: 3.97/4.0 *2014 – 2018*

Publications and Preprints

- **Albert Chua**. "Towards Time-Frequency Deformation Stability Bounds for Deep Convolutional Neural Networks." Submitted to ICASSP 2025.
- **Albert Chua**, Yang Yang. "Generalizing Geometric Nonwindowed Scattering Transforms on Compact Riemannian Manifolds." Sampl. Theory Signal Process. Data Anal. 22, 19 (2024).
- **Albert Chua**, Matthew Hirn, Anna Little, On Generalizations of the Nonwindowed Scattering Transform, Applied and Computational Harmonic Analysis, Volume 68, 2024, 101597, ISSN 1063-5203.
- Liping Yin, **Albert Chua**. "Long Range Constraints for Neural Texture Synthesis Using Sliced Wasserstein Loss." arXiv preprint, arxiv:2211.11137.

Personal Projects and Code Samples

Deep Decoder w/ TV layers | *PyTorch, NumPy*

- Unsupervised denoising of images by exploiting the implicit bias of a random decoder w/ learned Total Variation layers.
- Proposed method showed improved contrast/image quality compared to baseline methods with comparable run time.

Wavelet Pyramid in Parallel | *C++, OpenMP, MPI*

- Created a serial and parallel implementation of a wavelet pyramid with parallelized matrix operations.
- Parallelized via OpenMP/MPI, *speeding up the algorithm multiple times* compared to a baseline serial implementation.

Technical Skills

Languages: Python, C/C++, SQL, MATLAB
Libraries/Dev Tools: Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, PyTorch, Redshift, Sagemaker, OpenMP, MPI, Git, SLURM[, Linux