

# Albert Chua

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## PROFESSIONAL EXPERIENCE

### Global Atlantic Financial Group

New York, NY

*Risk Data Analytics Associate*

10/2023 – Present

*Risk Data Analytics Intern*

06/2023 – 08/2023

- Maintain reporting pipelines by validating database data quality and ensuring proper ETL processes.
- Refactored daily reporting pipeline steps, **reducing runtime by 80%** and saving **36 days of manual labor annually**.
- Built a **causal tree** demonstrating 3% increase in withdrawals per 10 BPS swap rate increase during COVID.
- Optimized the firm's MOWQLN optimizer for LASSO models using **JIT compilation**, cutting **training costs by 33%**.
- **Trained/deployed a Multi-Adaptive Regression Spline model** to monitor surrender risk for approx. \$35bn in assets.
- Implemented a custom **knowledge distillation** method for LASSO Logistic models, improving loss predictions by 10% compared to a baseline LASSO model without distillation.

### Amazon, B2B Payments

Seattle, WA

*Data Scientist Intern*

06/2022 – 09/2022

- Worked with billions of rows of **clickstream/payment data** to feature engineer a **B2B payment fraud dataset**.
- Developed an **XGBoost** classifier for the fraud detection pipeline, reducing **fraud losses by \$20mm**.
- Prototyped an 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." Accepted 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. [git](#)

## PERSONAL PROJECTS AND CODE SAMPLES

### [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.

### [Wavelet Scattering Transform](#) | PyTorch, NumPy

- Created a guidebook for the **Wavelet Scattering Transform (WST)**, a no-learning feature extractor, from first principles.
- Used the WST for classification, which showed a **4% improvement** similar over MLP/convolutional architectures with similar complexity.

## TECHNICAL SKILLS

**Skills:** Python, C/C++, SQL, MATLAB, Software Engineering, Computational Optimization, Machine Learning, Deep Learning, High-Performance Computing, Data Analysis, Data Visualization

**Libraries/Dev Tools:** Pandas, PySpark, NumPy, Matplotlib, Seaborn, Scikit-learn, XGBoost, PyTorch, OpenMP, MPI, SLURM, Git