# Lawrence Zhang

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## Education

**University of Maryland (3.63/4.00 GPA)** College Park, MD

*B.S. Computer Science, Double Minor in Statistics & Computational Finance* *Planned: May 2025*

**Select Coursework:** Natural Language Processing, Deep Learning, Artificial Intelligence, Data Science, Functional Programming, Computer Systems, Algorithms, Web Application Development, Data Structures & Algorithms Financial Markets and Datasets, Probability Theory, Statistical Inference & Estimation, Statistical Computing

## Experience

***Incoming SDE Intern @ Amazon*** *May. 2024 – Aug. 2024*

- Amazon Fulfillment Technology

**Undergraduate Researcher @ UMD MIND Lab** Jan. 2024 – Present

*University of Maryland MD - Python, Statsmodels, Scipy*

- Assisted in research lab on time series analysis and segmentation of breath sensor data to identify anomalies in force and acceleration data using Scipy and Statsmodels in order to help predict sickness in patients
- Optimized code base improving load times up to 80% on key data visualization platforms by performing data augmentation to identify and condense overlapping force and sleep period data intervals

**AbbVie SWE Intern** May. 2023 – Aug. 2023

*North Chicago IL - JavaScript, HTML, SQL, Unit Testing, Regression Testing*

- Created a full-stack internal project request website utilizing SQL and JavaScript for employees to request projects and SETI team members to manage projects and forecast development timelines.
- Performed unit testing and regression testing on internal company applications and identified bugs and enhancements in order to improve the UX of submitting and viewing vendor data
- Assisted in creation of testing process and error reporting for external adverse event reporting tool

## Projects

**SIF Options Data Infrastructure** | *Python, SQL, Dolt, Pandas, Numpy, Quantlib*

- Developed options data infrastructure for UMD's Smith Investment Fund, to handle and store over 3 billion rows of data and 2TB of historical options data, as well as access daily earnings data and volatility info
- Optimized SQL server to reduce storage costs and access speeds by creating custom data upload and storage algorithm to calculate greeks and rebuild option chains dynamically reducing storage size and cost by 40%
- Created custom options alpha using a new options backtesting engine to evaluate shorting volatility through earnings events as well as time series volatility analysis to allow for more advanced alpha research

**WeatherNet - Super Resolution** | *Pytorch, Numpy, Google Cloud, Xarray* Paper

- Created a novel climate super-resolution model to downscale 1.0 degree resolution Grpahcast and ERA5 climate reanalysis data down to 0.5 resolution, allowing for improved detail in climate forecasting
- Implemented custom CNN model based on a modified SRCNN architecture utilizing skip connections and residual blocks with 76% accuracy on downscaling cloud coverage and temperature data
- Created custom data pre-processing pipeline, optimizing model performance when trained on over 400GB of cloud based climate data, as well as experimented with GAN and INR based models

**ExamIn** | *Python, Firebase, Tesseract, Pandas, Git* Website

- NewEgg HackIMSA Hackathon 1st Place (1st out of 60+ teams)
- Designed and created a full-stack website with hackathon team to simplify AP Exam studying with an engaging and algorithmic study regimen using repetitive memorization
- Handled backend implementation using Firebase and Firestore to store account and question data
- Developed AI-powered scraper software with pytesseract using OCR to automatically parse and convert pdf exam questions to json data

## Technical Skills

**Languages**: Python, Java, C, Ocaml, Dart, JavaScript, Rust, MATLAB, SAS
**Developer Tools**: Linux/Unix, SQL Firebase, Git, MongoDB, Maven, JUnit, Pytest, Excel
**Libraries**: Pytorch, NLTK, Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn, Selenium