Hoang Viet Chu

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EDUCATION

Pitzer College Claremont, CA
Bachelor's Degree, Joint Computer Science and Mathematics (Honors) Expected May 2024

- **GPA**: 3.7 / 4.0 (Major GPA: 3.9 -- all Math and CS classes cross-registered at Harvey Mudd College)
- **Teaching Assistant for 1 year**: Data Structures and Algorithms in C++, Intermediate Probability, Abstract Algebra
- **Classes**: Machine Learning, Computer Systems, Computer Graphics, Statistics, Linear Models, Combinatorics, Logic

AWARDS

- **Math**: 1st Prize: Vietnam Mathematical Olympiad, Silver Medal: Asian Pacific Mathematical Olympiad, 3x AIME
- **Coding** (no high school experience): 1st Place: Citadel Datathon, Round 3: Google Code Jam, Winner: SIG Challenge

RESEARCH EXPERIENCE

Periwinkle Trading August 2023 - Present
Quantitative Researcher - Contract (advised by Periwinkle's CEO and former PDT Partners's partner) *Python*

- Working on the optimal execution under uncertain volume and linear propagator model using dynamic programming.
- Developing a market impact model that penalizes the testing of trade execution strategies in simulation environments.
- Consulted a Naive Bayes-LASSO-SVR feature filter which reduced overfitting of Periwinkle's 3-day forecast model.

University of Southern California - Viterbi School of Engineering June 2023 - August 2023
Research Intern (Topic: *"Last-Mile Delivery Optimization with Recurrent Neural Network"*) *Python, MATLAB*

- Proposed and built a pair-wise Recurrent Neural Network with a customized attention-based mechanism to predict the deviated path a driver would follow - adaptive to circumstances - compared to the theoretically planned shortest path.
- Designed a Sequence Generation Algorithm to identify the first stop of a route that yields the optimal operational cost and improved the time to reach the global minima by 15% compared to the traditional LSTM encoder–decoder.

Independent Research in Mathematics January 2023 - May 2023
Topic: *"Explore Constraints on Unitary Recurrent Neural Networks"* (**paper**) *Python, Keras*

- Proved that bounding weight matrices within Unitary group exhibits superior parameters training and thus can prevent the RNN vanishing and exploding gradient problems when stacking multiple recurrent layers.
- Implemented a Unitary Recurrent Neural Network from scratch, adapting Arjovsky's paper while introducing a novel update rule constraint from prior proof to demonstrate the new model's practicality across Language Modeling tasks.

Citadel Datathon - LendingClub Risk Assessment (dataset size: 26,000,000) *Python, Pandas, Numpy, Scikit-learn*

- Ideated and implemented a customized Mahalanobis Distance for K-Means which helped our team discover that LendingClub couldn't detect new borrowers who'd defaulted and altered personal info and manipulated interest rates.

SOFTWARE ENGINEERING EXPERIENCE

Meta May 2022 - August 2022
Engineering Intern (received return offer) *Python, Numpy, Scikit-learn, PyTorch, Hadoop (MapReduce), SQL*

- Delivered a topology-preserving Dimension Reduction algorithm for Meta AI's CommerceMM model, achieving a **93% reduction in parameters** and a 2% improvement in accuracy for labeling **100,000,000+ Marketplace images**.
- Proposed a model-agnostic Window Selection algorithm partially addressed Vision Transformer's exponential scaling issue and helped researchers conduct performance analysis of the model and compare that with Meta AI's ResNet50.
- Utilized Directed Acyclic Graph data structure that improved runtime of Meta's generational data workflows by 20%.

CoHost.ai (Seed-stage Startup) June 2021 - August 2021
Engineering Intern (only intern in the company) *C++, Linux, MongoDB, gRPC, Kubernetes, Terraform, AWS*

- Developed a multi-thread message queue with inter-thread communication method preventing message loss if crashes.
- Designed tree serialization algorithms reducing company web PageSpeed **from 30 secs to a consistent 0.8 second**.

SKILLS

- **Programming Languages**: Python, C++, Java, JavaScript, TypeScript, React, Golang, SQL, Racket, MATLAB, R
- **Technologies**: Linux, GraphQL, MongoDB, SQLAlchemy, gRPC, Kubernetes, GCP, AWS, Beautiful Soup, Git