

# Henry (Hoang) 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 (Math and CS classes cross-registered at Harvey Mudd College).
- **Classes:** Data Structures and Algorithms (TA), Advanced Probability (TA), Neural Networks (TA), Abstract Algebra (TA), Machine Learning, Natural Language Processing, Statistics, Linear Models, Mathematics of Data Science, Logic and Computational Theory, Advanced Linear Algebra, Programming Languages, Computer Systems.

## AWARDS

- 9 / 82 teams - Southern California ICPC Contest
- Gold Medal (9 / 382): National Math Olympiad
- 3rd Ranked: National Math Modeling Olympiad
- Silver Medal: Asian Physics Olympiad
- [Codeforces Master \(2147 rating - Top 3%\)](#)
- [Top 1% \(Round 3\) Google Code Jam 2022](#)
- [4th Place - Citadel Terminal Algorithm Contest](#)
- [1st Place - Citadel Summer Invitational Datathon](#)

## WORK EXPERIENCE

### Periinkle Trading ([periinkletrading.com](https://periinkletrading.com))

August 2023 - Present

Quantitative Researcher - Contract (report to the CEO)

*Technologies: Pandas, Numpy, Scikit-learn, Apache Spark*

- **Improved** weighted correlation coefficient **from .64 to .81** with **45% reduced features** by utilizing geometry, linear algebra, and binary search algorithm to find LASSO penalty term that  $\max(\text{VIF score}) < 3$  and minimizes AIC.
- **Scaled** a price/yield calculation engine in C++ that handled increased **from 30000 to 65,000** daily requests, and created an integration testing suite in C++ for all types of trades and also implemented metrics logging to Datadog.
- **Reduced** model **runtime** by **60%** training **20GB of data** by leveraging Linear Algebra to avoid matrix inversion and statistical metrics **computational complexity from  $O(n)$  to  $O(\log n)$**  by utilizing Double Heaps and Binary Search.

### University of Southern California

June 2023 - August 2023

Undergraduate Research Intern

*Technologies: Pandas, Numpy, Scikit-learn, OR-Tools*

Topic: "Solving the Vehicle Routing Problem with Recurrent Neural Network (RNN)"

- Proposed and **developed in C++ from scratch** a customized Attention-based Recurrent Neural Network model.
- **Solved seq2seq's adaptability issue** with unordered sequences by convincing the team to use LSTM encoder-decoder (capture global instead of local information) with **a model built in Python** that **saved 15% time** on average than TSP.
- Proved convergence to suboptimal loss of incremental gradient method techniques in network optimization, and **utilized past research** in Group Theory to avoid RNN's vanishing and exploding gradients in model deployment.

### Meta

May 2022 - August 2022

Engineering Intern

*Technologies: PyTorch, Pandas, Numpy, Scikit-learn, Hadoop (MapReduce), kDB*

- Researched Vision Transformer (ViT) papers and delivered in Python a working model to replace Meta's ResNet50
- Resolved ViT's Time Limit Issue in hyperparameter tuning by designing, discussing, and implementing independently a new Window Selection Optimization algorithm that **helped Vision Transformers compute 30% faster**.
- **Improved label accuracy by 2%** on **100,000,000+** Marketplace training data after researched, pre-trained in Python, and proposed Google's Contrastive Captioners encoder-decoder (arxiv.org/abs/2205.01917) in lieu of Meta's CLIP.

### Cohost.ai ([cohost.ai](https://cohost.ai))

June 2021 - August 2021

Engineering Intern

*Technologies: gRPC, PostgreSQL, Apache Kafka, kDB*

- Developed full-stack a Rasa-NLU based chatbot **in Python** and utilized multi-threading to handle concurrent queries.
- **Prevented message loss** by building **in C++** an IPC message queue (self-studied Systems) for the company chatbot.

## PROJECTS

### ClaremontCourses | Independent

*Python, React, JavaScript, RESTful API, Selenium, Flask, Node.js, AWS*

- Built a full-stack class search website with **5200+ courses API endpoints** in JavaScript and automated course fetch.
- Designed algorithms with bitwise operation that optimized search time **from 25 to 0.8 seconds** per course query.

### Traveling Salesman Art | Independent

C++

- Designed algorithms finding min-weight Hamilton cycle which draws a copy of original image using minimum lines.