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
- **Coursework**: Data Structures (**Teaching Assistants for 1 year**), Algorithms, Computer Systems, Computer Graphics, Computational Theory and Logic, Data Mining, Abstract Algebra, Intermediate Probability, Statistical Linear Models.
- **Awards:** Silver Medal - Asian Physics Olympiad, USACO Platinum, Facebook Hacker Cup Round 2 Qualifier, Winner - SIG Coding Challenge, First Prize - Vietnam Mathematical Olympiad, 3rd Place - Cybercore CTF Challenge

WORK EXPERIENCE

University of Southern California June 2023 - Current
Undergraduate Summer Research Scholar in Operations Research and Data Science *Python, MATLAB*
Topic: *"Nonlinear Optimization of Return on Investment for Facility Costs under Probabilistic Utility Models"*

- Proved that adding a deterministic and a random error makes the model non-convex and often fails to yield a solution.
- Devised, proved, and tested my proposition: changing from adding to multiplying a deterministic and a random error term transformed the cost optimization function from non-convex to solvable under any uniformly generated datasets.
- Proposed, customized, and implemented a multi-cut approximation algorithm that well-approximated the solution of this NP-Hard problem while performing 5 to 10 times faster than a solver's traditional local search heuristic algorithm.

Meta May 2022 - August 2022
Engineering Intern (received return offer) *Python, SQL, PyTorch, Kubernetes, TransformerNN, Dataswarm*

- Proposed and delivered a topology-preserving dimension reduction algorithm achieving a 93% parameter reduction and improving 2% in accuracy for labeling 100,000,000+ Marketplace images using Meta AI's CommerceMM model.
- Designed a model-agnostic window selection algorithm partially addressed Vision Transformer's exponential scaling issue and facilitated a comprehensive performance analysis and comparison of the model with Meta AI's ResNet50.
- Utilized properties of directed acyclic graphs to accelerate the automation of generational data workflows in batches.

CoHost.ai (Seed-stage Startup) June 2021 - August 2021
Engineering Intern (only intern in the company) *C++, JavaScript, Rasa NLP, Datadog, REST API, Mockito, Travis CI*

- Architected the system design for the company's web chatbot suggesting rental houses and serving 2000+ daily users.
- Deployed a fault-tolerant message queue for Inter-Thread Communication which prevents message loss if the program crashes, supports any data types as a message payload, streamlines ownership, and leaves no copies of messages sent.
- Designed test suites reaching 100% branch code coverage and enhanced CI/CD with Travis CI's cloud solution.

PROJECTS

Python to Java for Android Development | **MLH Fellowship** Open-Source Contributor *Java, Python, gRPC, GoMock*

- Wrote helper functions that detect and remove redundant bytecodes and avoid crashes when variables jump addresses.
- Refactored the team's embedded virtual machine that tracks and benchmarks performance improvement of OS' power, thermals, and latency and streams performance metrics across execution environments to an analytics dashboard.

LendingClub Risk Assessment | **Citadel Summer Datathon Winner** *Python, Numpy, Sklearn, Matplotlib*

- Performed statistical analysis on selected datasets totaling 26,000,000 data points and discovered that LendingClub had failed to detect new borrowers who'd defaulted and altered their personal information to manipulate interest rates.
- Developed a k-NN forecasting model with 94% accuracy for classifying and predicting new borrowers' interest rates.

C-- Compiler | Independent *OCaml, ocamllex, ocamlyacc*

- Built a compiler in Ocaml for programming language C--.
- Reduced machine code produced by the compiler by 40% using constant folding and propagation technique.

ClaremontCourses, Independent *Python, HTML, CSS, JavaScript, SQL, Beautiful Soup, Protobuf*

- Built a course searching website solving school portal's performance issue and being featured in the school newspaper.
- Designed tree serialization algorithms optimizing the website's PageSpeed from 25-30 secs to a consistent 0.8 second.

STEM for Vietnam (Non Profit), Independent *Golang, React, React Native, Node.js, REST API*

- Delivered a bug-free Physics learning game for kids with self-designed OOP classes for object motions and collisions.