

# Andy Shen

SOFTWARE ENGINEER · COMPUTER SCIENCE STUDENT · ML RESEARCHER

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## Education

### University of California, Los Angeles (UCLA)

*Expected: June 2023*

B.S. IN COMPUTER SCIENCE

*GPA: 3.77 / 4.0*

- Relevant Coursework: Data Structures, Algorithms and Complexity, Software Engineering, Computer Architecture, Operating Systems, Artificial Intelligence, Machine Learning, Discrete Mathematics, Multivariate Calculus, Differential Equations, Linear Algebra (Honors)
- Activities: DataRes @ UCLA (Design Head), exploretech.la Design, Bruin Visual Arts Club, Intramural Volleyball and Basketball
- Awards: Dean's Honor List (Winter 2019, Spring 2020), Best Machine Learning Hack (HOTH6)

## Work Experience

### PARISLab at UCLA

*July 2020 - Oct. 2020*

MACHINE LEARNING RESEARCHER

- Applied machine learning techniques on glass datasets to predict atomic structure and material properties.
- Researched **explainable neural network** architectures for extracting symbolic relationships from unstructured data.
- Implemented additive index models in **PyTorch** to recover generative mechanisms for example datasets with **< 0.07 RMSE**.

### UCLA Olga Radko Endowed Math Circle

*April 2020 - Present*

UNDERGRADUATE INSTRUCTOR

- Guided **mathematically gifted** 8<sup>th</sup> graders through redesigned topics from the UCLA undergraduate math curriculum.
- Simplified concepts, such as finite automata and graph theory, to match the cognitive levels of individual students.
- Automated the creation of virtual whiteboards as a teaching aid using the **requests** and **Selenium** libraries.

### Kanaung Hub Incubation Center

*June 2018 - Sept. 2018*

SOFTWARE ENGINEERING INTERN

- Collaborated with Android developers to curate 12 design mock-ups for a tourism app.
- Established an automated unit testing framework with **unittest** for a Flask media server.

## Selected Projects

### Bobby FishAI Chess Engine (Python, Javascript, C)

*Dec. 2020*

- Embedded a neural network based static evaluation function (NNUE) into a python-chess engine.
- Profiled various parallel search heuristics, such as vanilla **minimax**, **alpha-beta pruning**, **Monte Carlo tree search**, etc.
- Implemented Opening Book and Syzygy Endgame probing to increase engine playing strength to **2150 ELO at search depth 6**.
- Connected Flask backend to a Javascript GUI via REST APIs, and hosted a playable demo at: [andyshen55.pythonanywhere.com/](https://andyshen55.pythonanywhere.com/)

### GPT Ghost Writer (Python: Tensorflow)

*Dec. 2020*

- Converted and compiled textual data from authors with distinctive prose, such as: Franz Kafka, Gabriel Garcia Marquez, etc.
- Applied **transfer learning** techniques to fine-tune GPT-2, in order to generatively produce text in the style of different authors.

### Neural Style Transfer (Python: Tensorflow)

*May 2020*

- Generated stylistically shifted output images from content/style input image pairs, via transfer learning on VGG-19.
- Refined hyperparameters, such as **convolutional layer combinations and content/style loss** to shape the output image aesthetic.

### LA Hacks 2019, Veritas Fake News Detection (Python)

*March 2019*

- Leveraged Taboola's API to periodically scrape and sort news articles by trending categories.
- Applied **sentiment analysis** on grouped articles to determine semantic agreement between headlines and body texts.
- Received the **'Best Use of Taboola Trends API'** award, for our one vs. all fake news detection algorithm.

### Genome Matcher (C++)

*Feb. 2019*

- Implemented a Trie-based DNA library, capable of storing and flexibly matching genomes up to **3,000,000 bases** long.
- Developed a **recursive linear time search** function for exact and single nucleotide polymorphic sequences.

## Skills

**Programming** Python, C++, C, Javascript, HTML5, CSS, Bash, SQL, x86 Assembly, Octave

**Technologies** Tensorflow, PyTorch, SKLearn, NumPy, Pandas, Flask, Git, Matplotlib, Figma, Adobe Photoshop, LaTeX