Alexander Yuan

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Education

Yale University Aug 2021 - May 2025

Bachelor of Science in Computer Science *GPA: 3.93/4.00*

- **Activities**: Yale Water Polo, Yale Computer Society, Yale Machine Learning, Code Haven, Mathcounts Coach
- **Honors**: Yale Research Fellow Award, USA Computing Olympiad Gold, US Congressional App Challenge Winner
- **Courses**: Data Structures, Systems Programming and Computer Organization, Algorithms, Object-Oriented Programming, Human-Computer Interaction, Full-Stack Web Programming, Database Design and Implementation, Distributed Systems, Artificial Intelligence, Machine Learning, Operating Systems, Discrete Mathematics

Experience

SpaceX May 2024 - Aug 2024

Software Engineering Intern for Starlink *Hawthorne, CA*

- Supported Starlink flight operations with the TT&C team to ensure continuous Wi-Fi for over 3 million users
- Deployed to production a satellite gateway contact prioritization algorithm with C++ and Kubernetes, leveraging telemetry inputs for fully automated ground communication during load shed, launch, and software update events
- Designed a UI for operator-driven manual priority adjustments using Python, Angular, TypeScript, and PostgreSQL

Yale Department of Computer Science Jan 2024 - May 2024

Algorithms Teaching Assistant *New Haven, CT*

- Led sessions for 150 students on algorithms, covering divide-and-conquer, graphs, greedy, and dynamic programming
- Used Python/Java to teach algorithm implementation and efficiency and PollEv for interactive learning and feedback

NASA Jun 2023 - Aug 2023

Software Engineering Intern - Safety-Critical Avionics Systems *Hampton, VA*

- Developed an app end-to-end using C++, Bazel, JSON, Linux, and Core Flight System (cFS) that predicts the Remaining Useful Life of an autonomous drone's onboard battery and generates a real-time adaptive flight plan
- Deployed code on FAA-NASA certified drone, achieving project goals within 1yr timeline for forest fire mitigation
- Adhered to formal software development protocol for NASA's Class C: Mission Support Software flight approval

Yale Social Robotics Lab May 2022 - Dec 2022

Research Intern under Prof. Brian Scassellati *New Haven, CT*

- Worked on the feature rollout of Ommie, a robot that provides anxiety support through deep breathing exercises
- Used Raspberry Pi, ROS, and Python to integrate sensors (IMU, Thermal and RGB Camera, Radar) within Ommie for the creation of a custom dataset for deep breathing analysis–the first of its kind to be publicly available
- Built long short-term memory and gated recurrent unit ML models using PyTorch for respiration phase recognition

Projects

Predicting FOG in Parkinson's Patients | *Python, Jupyter Notebook, TensorFlow, Scikit* Mar 2020 - Jan 2021

- Leveraged LSTM and GRU deep learning models with transfer learning to achieve a 95% accuracy rate in predicting Parkinson's "Freezing of Gait" (FOG) by analyzing motion data from the Daphnet FOG dataset
- Work was published (https://ieeexplore.ieee.org/document/9356329) and presented at the IEEE International Conference on Machine Learning and Applications, December 14-17, 2020, Miami, Florida with 300+ views

Yost and Yound | *Python, Flask, HTML, CSS, JavaScript, React, MySQL, REST API* Feb 2023 - May 2023

- Built full-stack web app to streamline lost/found item returns with secure login, dynamic search, real-time messaging
- Facilitated 50+ item returns and enhanced user engagement through intuitive UI and efficient database management

Alpha-Gomoku | *Python, AI, OOP, Parallel Monte Carlo Tree Search, Genetic Algorithm* Oct 2023 – Dec 2023

- Implemented the Gomoku game end-to-end, employing Object-Oriented Design and the Factory Design Pattern
- Developed AI agents that implement Monte Carlo Tree Search, Minimax with Alpha-beta Pruning, and Greedy with heuristics tuned by a genetic algorithm to achieve win rates of 80% against friends and 100% against a random agent

Technical Skills

Programming Languages: Python, C, C++, Java, SQL, HTML, XML, CSS, JavaScript, R, Racket, x86-64 assembly
Frameworks: Flask, React, Node.js, Jinja2, jQuery, JUnit, WordPress, core Flight System (cFS), FastAPI, Kubernetes
Developer Tools: Git, Github, PostgreSQL, Bazel, Protobuf, Amazon Web Services (AWS), Jupyter Notebook, LaTeX(Overleaf/R Markdown), Figma, Jira, Confluence, VS Code, Robot Operating System, Linux, Windows, Bash, Excel