Ryan Hu

ryanrhu00@gmail.com | (425) 393-7058
Bellevue, WA, 98006

INTERESTS

Software Development | Machine Learning | Cloud Computing | Cryptography

EDUCATION

California Institute of Technology (Caltech) – Class of 2027 **September 2023 - June 2027 (Expected)**
Bachelor of Science in Computer Science

- **Cumulative GPA:** 4.2/4.0 Unweighted
- **Activities:** Undergraduate Research, Teaching Assistant, NCAA Men's Basketball, Peer Academic Coach
- **Relevant Coursework:** Introduction to Computer Programming, Introduction to Programming Methods, Introduction to Software Design, Introduction to Deep Learning, Learning Systems, Machine Learning & Data Mining, Advanced Topics in Machine Learning, Decidability and Tractability, Algorithms, Introduction to Computing Systems, Fundamentals of Computer Programming, Differential Equations, Introduction to Probability and Statistics, Mathematical Foundations of Computer Science, Calculus of One and Several Variables and Linear Algebra,

PROFESSIONAL EXPERIENCE

Tracevision **Los Angeles, CA**
Software Engineer Intern *April 2025 – Present*

- Working in the Math Team on geospatial API development and production tool infrastructure.
- Developing scripts and pipelines to process and integrate location data for proofs-of-concept and real-world deployment in security and retail sectors. https://github.com/tracevision/trace-vision-api-demo

California Institute of Technology **Pasadena, CA**
Research Assistant – Alvarez Lab *February 2025 – Present*

- Working in collaboration with Activision. Developing methods for toxic, anomalous, and outlier player behavior detection in competitive action games.
- Utilizing auto-encoders, feature subspaces, and clustering techniques to build a pipeline and robust machine learning framework for detecting and addressing unusual player behavior.

Teaching Assistant – CS21: Decidability and Tractability *September 2024 – March 2025*

- CS21: Decidability and Tractability, covering automata, Turing machines, decidability, time complexity reductions between computational problems, and NP-completeness.
- Office hours tailored towards teaching computer science proof-writing for algorithms, focusing on problem-solving techniques, formal logic, and complexity analysis.

Research Assistant – Alvarez Lab *April 2024 – September 2024*

- Investigated the role of climate change, air pollution, and epigenetics in the aging of people with HIV at the Caltech Alvarez Lab in collaboration with UCLA.
- Employed multiple feature selection methods and causal machine learning models, including random forest and XGBoost, to analyze relationships between various sociodemographic, climate, and air quality factors with different measures of aging.
- Initial model results indicate new positive relationships between specific external factors and the epigenetic aging of people living with HIV – currently authoring a research paper on these findings.

Research Assistant - GALCIT *June 2023 – September 2023*

- Worked in Graduate Aerospace Laboratories of the California Institute of Technology (GALCIT) to analyze and predict wind speed patterns.
- Developed a MATLAB program integrating machine learning and flow field algorithms, particularly YOLOv3 and estimateFlow, for comprehensive quantitative and qualitative analysis, verifying preliminary results that visual anemometry can be a viable method for wind speed prediction by accounting for various input factors and background noise.
- Investigated a novel method called visual anemometry that diverts from traditional approaches by taking advantage of visual cues of our environment to predict wind speeds.

HONORS AND AWARDS

Summer Undergraduate Research Fellowship (SURF) **June 2024**
Cisco CCNA Certification **June 2022**

SKILLS

Languages: English (Spoken and Written), Chinese (Spoken)
Programming Skills: AWS, Python (PyTorch, Scikit-Learn, Pandas, NumPy, OpenCV), C, C++, Java, MATLAB, Git
Developer Tools: Visual Studio Code, Eclipse, PyCharm, GitHub, CAD, LaTeX, Docker, Kubernetes