# Ryan Lin

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## Education

**California Institute of Technology** Pasadena, CA

B.S. Computer Science, Minor in Information and Data Sciences *GPA: 4.1/4.0* Graduation Date: 06/26

Relevant Coursework: Large Language Models for Reasoning, Machine Learning & Data Mining, Learning Systems (Machine Learning), Data Structures, Mathematical Foundations of Computer Science (Discrete Mathematics), Calculus of One and Several Variables and Linear Algebra, Differential Equations, Algorithms, Introduction to Probability & Statistics, Introduction to Computer Programming, Introduction to Software Design

## Experience

**Caltech - Anima AI + Science Lab** Pasadena, CA

*Student Researcher - advised by Dr. Julius Berner, Prof. Anima Anandkumar* Oct 2023 - Present

- Secured the Caltech Summer Undergraduate Research Fellowhip (SURF) by demonstrating exceptional research potential.
- Developing new machine learning architectures capable of zero-shot super-resolution for solving families of PDEs with arbitrary geometries.
- Incorporating new loss functions to neural operators (ex. physics losses) to improve training speed and data usage.
- Performing ablation studies on neural operator architectures to understand the impact of different components on performance and compare against state-of-the-art models.
- Improving code quality and flexibility of the neural operator repository.

**The MITRE Corporation** San Diego, CA

*Software Development & DevSecOps Intern - Security Automation Framework (SAF)* Jun 2023 - Sep 2023

- Engineered an end-to-end DevSecOps pipeline for SAF using applications, libraries, and tools created by MITRE and the security community. Hosted pipeline on EC2.
- Automated pipeline for key tasks (hardening, validation, visualization) to inform platform owners of security risks and accelerate capability deployment in development, test, and prod environments by up to 500%.
- Presented and demonstrated the prototype pipeline directly to corporate partners and government sponsors, articulating intricate technical details while highlighting its operational benefits and simplicity.

*Software Engineering Intern - Full-Stack Application Development* Jun 2022 - Sep 2022

- Developed an initial, modern reimplementation for STIGViewer within Heimdall (a full-stack application for viewing security results). The backend uses PostgreSQL, JavaScript, and Typescript. The frontend uses Vue and Typescript. Github

*Software Engineering Intern - Open Source Tools* Jun 2021 - Sep 2021

- Authored the SAF CLI (Command Line Interface), a software that streamlines security automation for IT Systems and DevOps pipelines with over 100,000 downloads by the security community. Github
- Created and published libraries to normalize outputs from various cybersecurity scanning tools into Heimdall Data Format (HDF) for various government sponsors and commercial partners, speeding up security accreditation processes by up to 1000%. Github

## Skills

**Programming Languages:** Java, Python, Typescript, JavaScript, R, Ruby, C, C++, Shell Script

**Developer Tools & Practices:** PyTorch, Jupyter, Weights & Biases, SLURM, GitHub, Android Studios, AWS, Brew, Bash/Shell, Docker, Eclipse, Firebase, NodeJS, VSCode, PyCharm, RStudio, PostgreSQL, Jenkins, Vuex, Chef, Ansible, Github Actions

## Projects

**Comparison of Classical and Quantum Information-based ML Models**
Explored structural and mathematical parallels of a Convolutional Neural Network and a Quantum Circuit. Engineered a hybrid quantum/classical binary classification model using Pennylane and TensorFlow.

**Stock Prediction Using LSTMs With Sentiment Analysis**
Implemented a multivariable LSTM model in R to predict the trajectory of any given ticker. Notable considered variables include previous time series data and a sentiment analysis on news headers.

**Y86 Architecture Simulation**
Developed and deployed a processor and assembler simulator from scratch, with no libraries. Github