Ryan Lin

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EDUCATION

California Institute of Technology (Caltech)   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, Probability & Statistics, Computer Programming, Software Design

EXPERIENCE

Caltech - Anima AI + Science Lab   Pasadena, CA

Researcher - advised by Dr. Julius Berner, Prof. Animashree (Anima) Anandkumar   Oct 2023 - Present

- 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 Engineering & Machine Learning Intern   Jun 2024 - Sep 2024

- Designed a pipeline leveraging Retrieval-Augmented Generation (RAG) and Large Language Models (LLMs) to enhance domain-specific knowledge retrieval and automate the creation of security tests from STIGs, accelerating security profile delivery by 500%.
- Utilized OpenAI API and LangChain's Chroma vector store, and custom embeddings to optimize context retrieval from various security resource documentations.

Software Development & DevSecOps Intern   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   Jun 2022 - Sep 2022

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

Software Engineering Intern   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.
- Created and published libraries to normalize outputs from various cybersecurity scanning tools into Heimdall Data Format for government sponsors and commercial partners, accelerating accreditation processes by up to 1000%.

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.

LEADERSHIP EXPERIENCE

Director of Hacktech (Caltech's Annual Hackathon)   Nov 2023 - Present

- Managed a team of 10+ students to organize and execute a 36-hour hackathon with 500+ participants.
- Coordinated with sponsors, judges, and mentors to ensure a successful event.

AWARDS

Caltech SURF Fellow   Caltech (2024)

National Merit Scholarship Finalist   National Merit Scholarship Corporation (2023)

SKILLS

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

Developer Tools & Practices: PyTorch, Jupyter, TensorFlow, Weights & Biases, SLURM, CUDA, Linux, High Performance Computing (HPC), Natural Language Processing, GitHub, Android Studios, AWS, Brew, Bash/Shell, Docker, Eclipse, Firebase, NodeJS, VSCode, PyCharm, RStudio, PostgreSQL, Jenkins, Vuex, Chef, Ansible, Github Actions, LangChain, OpenAI API, Huggingface