

Jay Tipirneni

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EDUCATION

University of California, Berkeley – Data Science B.A. and Applied Mathematics B.A., Class of 2025 |

Relevant Courses: Data Structures and Algorithms, Principles and Techniques of Data Science, Discrete Math and Probability, Abstract Algebra, Efficient Algorithms and Intractable Problems, Artificial Intelligence, Real Analysis, Numerical Analysis, Complex Analysis, Optimization Models

Programming: Java, Python, Javascript, C++, Solidity, Node.js, React.js, Express.js, SQLite, MySQL, PostgreSQL, Numpy, Typescript, MongoDB (NoSQL), HTML, CSS, Go, OOP, Git, Kubernetes, PyTorch, SciKit Learn, Docker, GraphQL, Swift, Hadoop, Rust, TensorFlow, CI/CD

Skills: Microsoft Office-Excel, Data Analysis, Project Management (Jira, Linear), Scrum, UI/UX principles, SEO, Cloud Computing (AWS, Azure)

WORK EXPERIENCE

Undergraduate Researcher | UC Berkeley Sky Computing Lab

October 2024 – Present

- Developed open-source Python library, [Ember](#), for developing compositional networks and deploying large inference-time scaling architectures. Built distributed systems architecture for framework, enabling developers to create optimized, composable, and synchronized calls across LLMs.
- Conducted Compound AI Systems research under Prof. Matei Zaharia (CTO of Databricks). Researched decision-making under uncertainty and reliability in compound AI systems. Used LoRA, ensembles, and Dirichlet heads to optimize Epistemic Neural Networks for estimating uncertainty in LLM outputs.

Undergraduate Researcher | Lawrence Berkeley National Laboratory

September 2024 – May 2025

- Developed novel materials characterization technique via particle trapping under Prof. Vasilia Zorba. Developed specialized printed circuit boards using Altium. Automated analysis procedure using computer vision model to track particle trapping success rate, enabling researchers to sample 18% faster.
- Automated imaging techniques for material analysis by building data pipelines for analysis. Created 2D and 3D images of elemental compositions of novel materials. Conducted laser sampling coupled with optical emission and mass spectrometry technologies. Automation led to a 10% increase in sample rate.

Simulations Software Engineer | Space Enterprise @ Berkeley

December 2023 – May 2025

- Developed Data Analysis GUI Terminal to display launch, hotfire, weather, temperature, flight, and sensor data. Created data pipelines from InfluxDB for dynamic updates. GUI frontend built using React.js, JavaScript. Backend built using Python and FastAPI. Hosted on digitalocean, packaged with Docker. Enabled team to access data remotely without lab terminal to conduct analysis. Increased simulation efficiency by 15% via single source data access.
- Developed dispersion analysis simulation to predict wind direction and speed at varying altitudes for our in-house rocket. Used kernel density estimation to produce continuous distribution from which we sampled for weather analysis. Developed using Python, SciKit Learn Pandas, Numpy, Pytorch and MATLAB. Increased rocket landing accuracy by 10% because of resulting rocket design augmentations. Improved launch site location because of analysis.
- Developed Flight software for guidance systems written in Rust and C++. Improved flight software speed by 12% by optimizing using Rust. Developed flight analysis systems using Simulink/MATLAB for both modeling and to expedite trajectory model calculations. Set up CI/CD pipelines and unit tests.

Data Engineering Intern | HashKey Capital

January 2023 – August 2023

- Developed web crawler that increased monthly sourcing rate by 40%. Used Selenium, PostgreSQL database using SQL to query, ChromeDriver tooling, and Python to collect project/company data across news sites and social media. Created Graph Neural Network model in PyTorch and Keras to find valuable projects via social media clustering. Designed ETL process to move data to in-house database system. Hosted on GCP for remote execution.
- Wrote ~15 memos and ~30 1-pagers for the investment team. Conducted technical due diligence on prospective companies for the investment team. Established deal flows with partner firms and conducted market analysis for the investment team. A/B tested deal sourcing methods for investment team.

Project Lead | Blockchain @ Berkeley

September 2021 – May 2024

- Led team of 6 to develop a tool to execute read/write functions on Arbitrum using users' ethereum accounts for user experience improvement and sequencer bypassing for censorship resistance. Developed using Arbitrum SDK, express.js backend with react, shadcn/ui and javascript frontend. Increased protocol transaction count by 3% because of sequencer bypassing and UX improvement. Received recognition from Arbitrum engineering team via Twitter.
- Led team of 5 in developing an analytics portal for Wormhole bridge. Used knex.js, express.js, and javascript backend with react.js, and echarts.js frontend. Displayed asset traffic between wormhole bridge corridors, improving bridge utilization by 10%. Used Linear to manage workflows and sprints for the team.

Software Engineering Intern | LI.FI

May 2022 – September 2022

- Enabled developers and external teams to identify underutilized bridging across chains leading to improvements in the company's widget product speed by up to 2x by developing an analytics page in React.js, and JavaScript. Used SQLite for storing chain data and allowing queries. Improved the company's internal admin page in TypeScript, adding analytics pages and improving readability, expediting development time for chain configuration by ~10%.
- Established relationships with ~15 companies in the distributed systems industry. Vital for company growth, increasing widget use by ~15% over 2 months.

PROJECTS

WatchTower

February 2025

- Developed high-fidelity 3D simulation of aircraft surroundings for TreeHacks 2025. Built using CV models YOLO and MiDaS for object classification and depth perception. Implemented edge detection and point cloud for object clustering. Used Arduino and IMU to track acceleration and direction of primary vehicle. Simulation written in Python. Hardware integration written in C. Simulation classified relevant objects with 70% accuracy via fine tuning at ~15 feet.

ATLAS Marketplace LLM Agent

December 2024

- Developed open-source LLM agent application for testing negotiation strategies between buyer and seller agents and interfacing with online marketplaces to negotiate on behalf of users. Developed using OpenAI Swarm, Python, Next.js, FB Marketplace API. Increased negotiation rate by 14% via automation.

AI Mathematical Olympiad Kaggle

June 2024

- Fine-tuned model for solving national-level math challenges (AIMO) using machine learning models. Developed using Mixtral as a model, PyTorch for NLP implementation, on Jupyter Notebook. Achieved 8% improvement over baseline model using cross-validation, L1 regularization, and parameter tuning.

Regulus — Height Classification Model, AI Cal Hacks

June 2023

- Trained a height classification model to evaluate height of people with provided images. Built using a feed forward neural network (deep learning) in Pytorch, Numpy, Pandas and Keras. Developed with a shared compute layer on Anyscale to expedite training. Project won the Anyscale track prize out of 200 teams.

HONORS & AWARDS

- Columbia University LionHack, Multichain Award Winner** (2022)
- IB Multilingual Proficiency Award** (2021) - Sequoia High School
- NSPA Honor Roll** (2021, 2022) – National Scholastic Press Association
- IB Diploma** (2021) – International Baccalaureate