Samrat Sahoo

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Education

Stanford University (Incoming) September 2025 – June 2027
Master of Science in Computer Science *Stanford, CA*

Georgia Institute of Technology Aug. 2021 – May 2025
Bachelor of Science in Computer Science, Minor in Economics | GPA: 3.97/4.00 *Atlanta, GA*

- Concentrations: Artificial Intelligence + Systems and Architecture
- Awards: Bessemer Fellow, FinTech Fellow, Faculty Honors, Startup Pitch Competition Winner
- Coursework: Data Structures & Algorithms, Operating Systems, Compilers and Interpreters, Machine Learning

Research Projects & Publications

Financial Portfolio Optimization Using Deep Reinforcement Learning | *In Progress*

- Created an empirically-driven reinforcement learning environment to optimize retirement portfolios, simulating real-world circumstances better than synthetic data-driven environments
- Trained a soft actor-critic agent to create an optimal portfolio based on a user-defined risk-reward threshold

Exploration Critique Networks | *In Progress*

- Leveraging cross-attention between past trajectories and recent state transitions to guide RL exploration
- Implemented state compression using autoencoders to learn useful state representations by predicting current and future states with an augmented loss function using episodic reward

Scatter Protocol | *Accepted and published at IEEE International Conference on Blockchain (Blockchain 2024)*

- Developed an incentivized and trustless protocol for decentralized, federated learning (Solidity/Go-Ethereum)
- Created a decentralized, peer2peer node system to split machine learning loads across a network (GoLang/LibP2P)
- Designed a secure machine learning environment by introducing OS isolation using Open Container Initiative
- ***Citation:*** *S. Sahoo and S. Chava, "Scatter Protocol: An Incentivized and Trustless Protocol for Decentralized Federated Learning," 2024 IEEE International Conference on Blockchain (Blockchain), Copenhagen, Denmark, 2024, pp. 497-504, doi: 10.1109/Blockchain62396.2024.00073.*

Teaching ChatGPT | *Accepted and published at Human Factors and Ergonomics Society*

- Directed experiments with 150+ students to determine the efficacy of the protege effect applied with LLMs
- Conducted a literature review regarding teachable agents and psychological concomitants of the protege effect
- ***Citation:*** *Tidler, Z. R., Sahoo, S., & Catrambone, R. Teaching ChatGPT: Attempting to Demonstrate the Protégé Effect with a Large Language Model Learner. In Proceedings of the 68th International Annual Meeting of the Human Factors and Ergonomics Society. Phoenix.*

Universal NFT Vector Database | *Preprint*

- Developed public visualization and similarity matching APIs (Flask/Google Cloud Run) using RegNetY-080
- Devised a public graphical user interface (Vue.js/MongoDB) for easy interaction with vector database data
- Integrated task queue structure (AWS SQS/Celery) for horizontal scaling and hardware agnosticism
- ***Citation:*** *S. Sahoo, N. Paul, A. Shah, A. Hornback, S. Chava. "The Universal NFT Vector Database: A Scalable Vector Database for NFT Similarity Matching." (2023).*

Research Experience

Research Assistant December 2021 – Present
Georgia Tech Financial Services and Innovation Lab *Atlanta, GA*

- Designed and developed a large-scale database (Vue.js/Celery/Python) for Digital Asset counterfeit detection
- Built a privacy-centered federated learning protocol for collaborative machine learning (GoLang/Python/LibP2P)
- Leveraging deep reinforcement learning techniques to optimize retirement portfolio investments (PyTorch/NumPy)

Research Assistant Jan. 2023 – December 2024
Problem Solving and Education Technology Lab *Atlanta, GA*

- Researched different learning techniques (i.e., Explanations, Verbatim Script) for comparison against LLMs
- Prepared materials such as video transcripts, quiz questions, and the large language model prompt for the study

Work Experience

Software Engineering Intern May 2023 – July 2023
Cruise Automation (YC W14) *San Francisco, CA*

- Refactored the access control system, saving 100+ hours of engineering time per month (PostgreSQL/OPA)
- Engineered widgets displaying exit codes, and execution cost, saving 1000s of dollars (Kubernetes/Pulumi)
- Extended simulation platform's search engine to drive additional insights into tests (ElasticSearch/BigQuery)

Software Engineering Intern Jan. 2023 – May 2023
Visor *New York City, NY*

- Redeveloped the HubSpot chat integration for better user experiences for 1000+ users (Vue.js/HubSpot API)
- Built the settings integrations page from scratch for different CRMs (HubSpot/Salesforce/Atlassian APIs)
- Redesigned the Visor home page, optimizing for real-time filtering via graph manipulation (CloudstoreDB)

Software Engineering Intern June 2022 – August 2022
Fidelity Investments *Westlake, TX*

- Implemented a data interaction application (Vue.js/Express.js/AWS), saving 100+ hours of manual data mining
- Delivered automation APIs (GraphQL/Python) to 100 teams to interact with legacy engineering infrastructure
- Deployed data mining applications to 3000+ developers (Jenkins/ uDeploy), improving integration testing time
- Built modern GraphQL API layers on top of legacy SOAP APIs, reducing development time by 66 percent

Software Engineering Intern March 2021 – August 2021
Roboflow (YC S20) *Des Moines, IA*

- Created the training procedure for the Roboflow classification network (PyTorch/Docker) for 3 enterprise users
- Initiated the Roboflow SDK (Python) enabling better workflow integrations for 350,000+ developers
- Roboflow Python package integrated with YOLOv5 (25,000 stars on Github), increasing users by 1000 per month
- Adapted vision models like YOLOX and MobileNetV2 (C++/Python) for Roboflow (1000+ monthly users)

Open Source Software Engineering Projects

Bits of Good Unified Analytics Platform

- Devised an analytics dashboard for viewing analytics and managing projects for all 150 members at Bits of Good
- Deployed the API using serverless infrastructure to scale to economically handle 500,000 events per month
- Leveraged cron jobs through GitHub Actions to periodically ping analytics services for health monitoring purposes

Roboflow Python Package

- Extended the API to add better support to package functionality and edge cases for better developer experiences
- Architected the design of the Python package, establishing the direction of future extension and development
- Published to the package directory, resulting in 500,000+ monthly downloads in top machine learning repositories

Leadership

Director of Engineering, Engineering Manager September 2021 – Present
Bits of Good *Atlanta, GA*

- Led a team of developers using agile methodology to create a mobile app (React Native) for over 800 users
- Connected and streamlined 1400 developers through creating the National Hack4Impact Portal (Next.js/Azure)
- Began the Infrastructure Labs team to build scalable systems to reduce total development time by 100s of hours

Technical Skills

- **Languages and Frameworks:** PyTorch, NumPy, Python, Javascript, Java, Solidity, Typescript, GoLang, React.js, Vue.js, Nuxt.js, Next.js, Express.js, Flask, React.js, MongoDB, React Native, Assembly, C, LibP2P, SQL, Gymnasium (Reinforcement Learning)
- **Developer Tools and Libraries:** Git, Amazon Web Services (Simple Queue Service, Elastic Container Service), Google Cloud Product (Cloud Run), REST API, Docker, Docker Compose, GitHub Actions, Linux, CLI, RabbitMQ, Firebase, OpenAI Vector Store, Postman