Sundar Sripada V. S.

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Areas of Interest

Foundations of Reliable Learning: Empirical Inference, Trustworthy and Robust ML, Explainability, Interpretability
Applications: Computer Vision, LLMs, Reinforcement Learning, AI Safety, ML in Sciences (Physics, Astronomy, Earth)

Education

The University of Texas at Austin — **Austin, TX, USA**
Master of Science in Engineering (M.S.E), Electrical and Computer Engineering, GPA: 3.81/4 — *Aug. 2022 – Dec. 2024*

Anna University (SSN College of Engineering) — **Chennai, India**
Bachelor of Engineering (B. Eng), Electronics and Communication Engineering, GPA: 8.54/10 — *Jun. 2016 – Sept. 2020*

Sri Sankara Vidyashramam Matriculation Higher Secondary School — **Chennai, India**
Higher Secondary School Certificate, Total Score: 1,177/1,200 — *Jun. 2014 – Apr. 2016*

Academic Achievements

- Awarded **Ram's Horn Best Project Award** in Digital Image Processing at UT Austin for our project on *Style Transfer to Calvin and Hobbes Comics using Stable Diffusion* among a class of 140 students — Video, arXiv
- Graduated **First Class in Distinction** from Anna University, top 10% of the class (GPA: 8.54/10)
- Awarded **SSN Internally Funded Projects Grant** of ₹20,000 (€200) for a research project on *Design and development of a mobile robot for autonomous navigation using Simultaneous Localization and Mapping (SLAM)*
- Awarded **Merit Scholarship** for the Academic Year 2016-17 by Anna University for securing **University Rank #2** in Higher Secondary Examinations among 800+ candidates in Tamil Nadu State Board
- Graduated with **School Rank #2** from Sri Sankara Vidyashramam, 98.9^{th} percentile in Tamil Nadu State Board, securing Subject Topper awards in Maths (200/200), English (192/200), French (199/200)

Research Experience

ML Research Engineer — *Jan. 2025 – Present*
AI Safety Camp — **Remote**
- Developed and evaluated PPO-based LLM agents with Causal LM tokenizers to study adversarial reward optimization in Machiavelli and AgentHarm benchmarks — GitHub PR

Graduate Research Assistant — *Aug. 2022 – Jun. 2023*
Swarm Lab, The University of Texas at Austin — **Austin, TX, USA**
- Built a TensorFlow-based Smart Tool user activity recognition model with 87% classification accuracy across 4 tool-use behaviors, enhancing ergonomics for the user — Paper
- Led a team of 3 students in a large-scale data collection project and implemented an ML pipeline using CNN, TFLite, and MLFlow for real-time edge inference on a Raspberry Pi, achieving 162 ms per prediction

Research Engineer — *Oct. 2020 – Jul. 2022*
Robotics Research Center, International Institute of Information Technology — **Hyderabad, India**
- Implemented a PPO-based reinforcement learning model for autonomous vehicle control across LIDAR SLAM systems like LOAM, LeGO-LOAM, and LIO-SAM using large-scale CARLA simulations — Paper, GitHub
- Developed a PyTorch-based classification pipeline for LIDAR drift heatmaps, achieving 92 % classification accuracy and built a CNN pipeline around it achieving 76.8 % drift reduction over baselines — Paper, GitHub

Summer Research Fellow — *May 2019 – Aug. 2019*
Department of Electrical Engineering, Indian Institute of Technology (IIT) – Madras — **Chennai, India**
- Developed a MATLAB algorithm leveraging homogeneous matrix transformations in a stereo camera setup to estimate surgical tool-tip locations relative to fiducial markers for Image-Guided Surgery (IGS) systems

Work Experience (Industry)

Software Engineer Intern *Jun. 2023 – Aug. 2023*
Hewlett Packard Enterprise **San Jose, CA, USA**

- Enhanced HPE Aruba's network management tool scalability by developing Python-based VM simulation within Docker, integrating SQL-driven system data extraction, and enabling up to 2,000,000 simulated devices with rapid onboarding

Software Engineer Intern *May 2018 – Aug. 2018*
Ghost Vision Pvt. Ltd., IIT Madras Incubation Cell **Chennai, India**

- Developed a C# application for placing 3D objects on real-world surfaces using Augmented Reality (AR) techniques with Vuforia SDK in Unity3D

Mentorship/Teaching Experience

Graduate Teaching Assistant *Jan. 2024 – Dec. 2024*
Department of Physics, The University of Texas at Austin **Austin, TX, USA**

- Taught two sections of PHY 105N introductory Physics Lab 2, simplifying complex topics in Electricity and Magnetism for students from diverse backgrounds

ECE Pod Program Mentor *Aug. 2023 – May 2024*
Department of Electrical and Computer Engineering, The University of Texas at Austin **Austin, TX, USA**

- Mentored new graduate students in the ECE Pod Program, providing guidance on academics and life in Austin

Secretary of Robotics and Computer Vision *Jul. 2019 – Sept. 2020*
TechClubSSN, SSN College of Engineering, Anna University **Chennai, India**

- Taught introductory computer vision and robotics concepts to a class of 60+ undergraduate students
- Conducted weekly lab sessions and provided one-on-one support during office hours

Skills

Programming	Python, C++, C, Bash, R, MySQL, MATLAB, Java, Julia, JAX, HTML, CSS, JavaScript, LaTeX
Frameworks	PyTorch, TensorFlow, TFLite, LangChain, Gymnasium, ROS, MLFlow, InspectAI (AISI), Apache Spark, AWS (S3, EC2, SageMaker), CARLA, Gazebo
Libraries	numpy, pandas, polars, matplotlib, seaborn, OpenCV, HuggingFace Transformers, HuggingFace TRL, Stable Baselines3, CleanRL, RLlib, Pillow, scikit-learn, Keras
Tools	git, Docker, VS Code, Google Colab, Linux, Windows 10/11, MacOS, Microcontrollers
Certificates	AI Safety Fundamentals
Academic Service	Reviewer for: CASE 2022, CASE 2023, IROS 2023, ICRA 2024

Publications

[1] R. New, C. D. Salazar, J. Bendaña, *et al.*, "Design, development, and testing of a smart hand tool: Achieving work task recognition using synthetic data and edge intelligence," in *International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, American Society of Mechanical Engineers, vol. 88346, 2024, V02AT02A026.

[2] S. Shrestha, A. K. Venkataramanan, and S. S. Venugopalaswamy Sriraman, "Style transfer to calvin and hobbes comics using stable diffusion," *arXiv preprint arXiv:2312.03993*, 2023.

[3] A. Ram, S. Keshari, Z. Jiang, and S. S. Venugopalaswamy Sriraman, "Annotating sleep states in children from wrist-worn accelerometer data using machine learning," *arXiv preprint arXiv:2312.07561*, 2023.

[4] M. Omama, S. V. S. Sundar, S. Chinchali, A. K. Singh, and K. M. Krishna, "Drift reduced navigation with deep explainable features," in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2022, pp. 6316–6323. DOI: 10.1109/IROS47612.2022.9981330.

[5] M. Omama, S. S. V. S., S. Chinchali, and K. M. Krishna, "Ladfn: Learning actions for drift-free navigation in highly dynamic scenes," in *2022 American Control Conference (ACC)*, 2022, pp. 1200–1207. DOI: 10.23919/ACC53348.2022.9867473.