Hrishikesh Viswanath

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hrishikeshvish.github.io

Autonomous Driving, Navigation, Planning, Robotics, LLMs/VLAs in planning and navigation, Digital Twins

Education

2023–27* **Ph.D.**, Computer Science, Purdue University, **3.84**/4.00
2021-23 **M.S.**, Computer Science, Purdue University, **3.82**/4.00
2017-21 **B. Tech.** Computer Science, PES University, **9.03**/10.0

Experience

2025 **The Data Mine, Purdue University**
Graduate Data Science Researcher
Caterpillar: LLM Powered Data Analysis

2025 **Purdue University**
Graduate Research Assistant
Contributed to Purdue U-Tree Digital twin project, Researched impact of urban tree coverage structures on local weather patterns.

2024-25 **U.S. Devcom Army Research Laboratory**
Research Assistant
Scalable real-time SLAM systems and scenario modeling for autonomous agents

2022 **Rescon AI**
Machine Learning Intern
Experimented with Neural Operator architectures at Johns Hopkins startup

2021-24 **Purdue University**
Graduate Teaching Assistant
Mentored 500+ students in Compilers (CS 502), AR/VR (CS 490), Data Structures & Algorithms (CS 252), Computer Graphics (CS 334)

2021 **Cisco Systems**
Technical Undergraduate Intern
Built NLP driven AI-chatbot, with web frontend using scikit-learn, NodeJS, React and Django for router testbed performance monitoring

Research

Papers

2024 **Trajectory Prediction for Robot Navigation using Flow-Guided Markov Neural Operator**
Rashmi Bhaskara*, *Hrishikesh Viswanath**, Aniket Bera
IEEE International Conference on Robotics and Automation
Paper

2024 **Graph-based Decentralized Task Allocation for Multi-Robot Target Localization**
Juntong Peng, *Hrishikesh Viswanath*, Kshitij Tiwari, Aniket Bera
IEEE Robotics and Automation Letters
Github, Paper

2025 **HessianForge: Scalable LiDAR reconstruction with Physics-Informed Neural Representation and Smoothness Energy Constraints**
Hrishikesh Viswanath, Md Ashiqur Rahman, Chi Lin, Damon Conover, Aniket Bera
Conference on Computer Vision and Pattern Recognition Workshop on Neural Fields Beyond Conventional Cameras
Preprint

2025 **Gradient-Free Physics-informed Operator Learning using Walk-on-Spheres**
Hrishikesh Viswanath, Hong Chul Nam, Julius Berner, Anima Anandkumar, Aniket Bera
Neural Information Processing Systems (NeurIPS), 2025 Workshop on AI4Science

Ongoing Work

2025 **Constraint-Based Energy Optimization for Driving Scenario Generation: A Principled Integration of Physical Rules in Data Driven modeling**
Hrishikesh Viswanath, Juanwu Lu, Damon Conover, Aniket Bera

2025 **Grounded Reasoning for End-to-End Autonomous Navigation using semantic Vision-Language-Bayesian modeling**
Hrishikesh Viswanath, Juanwu Lu, Damon Conover, Aniket Bera

2025 **Understanding the impact of Reward Models on LLM Reasoning Trajectories using Monte-Carlo Tree Search**
Andrey Shor, Hrishikesh Viswanath

2024 **Data free training of Neural Operators with stochastic Walk-on-Spheres approximations**
Hrishikesh Viswanath, Hong Chul Nam, Julius Berner, Anima Anandkumar, Aniket Bera
Draft

2024 **Reduced-Order Neural Operators: Learning Lagrangian Dynamics on Highly Sparse Graphs**
Hrishikesh Viswanath, Yue Chang, Julius Berner, Peter Yichen Chen, Aniket Bera
Github, Arxiv

2023 **ARTEMIS: AI-driven Robotic Triage Labeling and Emergency Medical Information System**
Revanth Senthilkumaran, Mridu Prashanth, Sathvika Kotha, *Hrishikesh Viswanath*, Kshitij Tiwari, Aniket Bera
Arxiv

Skills

Planning & Simulation	End-to-End Navigation, Motion Planning, Digital Twins, Scenario Generation, Behavior & Motion Forecasting, occupancy flow modeling
Perception & Robotics	SLAM, Semantic Scene Understanding, Human-Agent Interaction, ROS2
Core Methodologies	Generative AI (Score-based SDEs, EBMs), Stochastic Modeling (Monte Carlo), Bayesian Inference, Scientific Machine Learning (SciML)
Languages & Libraries	C++, Python, PyTorch, Hugging Face, TensorFlow, Scikit-learn, VLM, LLM, VLA
Relevant Datasets	Waymo Open Motion Dataset, Argoverse 2

Open Source Contribution

Fairpy: A python toolkit for measuring Biases and mitigating them in Open-source Large Language Models (LLMs). Supports WEAT score, StereoSet, NullSpace Projection

MPM-Verse: A large scale physics simulation dataset designed for learning and predicting MPM-based physical simulations including water, sand, plasticine, and jelly.

Academic Service

Reviewer

2024 ICLR 2025 The Thirteenth International Conference on Learning Representations
2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Mentorship

2024 **Space and Earth Analogs Research Chapter at Purdue** Vice President & Administrative Lead
2024 **Astro-USA initiative** Involved in fundraising and planning for a student led analog habitat facility.
2024 **NASA SUITS** Mentored the NASA SUITS team JARVIS, for the on-site round of SUITS
2024 **ARTEMIS** Mentored undergraduate students at IDEAS lab for Purdue undergraduate research conference

2023 **RASC-AL** Mentored an undergraduate team for NASA Rasc-AL challenge