Shivam Aarya

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Research Interests

Embodied AI, Robotics, Computer Vision

Education

Johns Hopkins University – Baltimore, M.D. Fall'23 - Spring'26

- B.S. Computer Science, Applied Mathematics & Statistics, Robotics

Awards/Honors

- Dean's List for all semesters (Fall'23, Spring'24, Fall'24, Spring'25), Johns Hopkins University
- IROS'24 Travel Grant ($4,210$), Johns Hopkins University, Fall'24
- HOUR (Hopkins Office for Undergraduate Research) Catalyst Award ($1,000), Oct 2024
- *Three prizes at the HopHacks 2023 Hackathon*: Patient Safety Technology Challenge Winner at ($750), FFU New Venture Prize ($500), Overall third place ($256)
- *National Grand Prize*, 2020, Stanley Black & Decker Innovation Generation Challenge ($15,000 prize)
- FIRST Robotics Challenge (FRC) *Alliance Champion*, Programming Team Captain

Publications

[1] Lance Ying, Xinyi Li, **Shivam Aarya**, Yizirui Fang, Jason Xinyu Liu, Yifan Yin, Stefanie Tellex, Joshua B Tenenbaum, and Tianmin Shu. SIFToM: Robust spoken instruction following through theory of mind. *ICRA (under review), arXiv preprint arXiv:2409.10849*, 2026, #Citations: 4.

[2] Yifan Yin, Zhengtao Han, **Shivam Aarya**, Shuhang Xu, Jianxin Wang, Jiawei Peng, Angtian Wang, Alan Yuille, and Tianmin Shu. PartInstruct: Part-level instruction following for fine-grained robot manipulation. In *Robotics: Science and Systems (RSS)*, 2025, #Citations: 3.

[3] Lance Ying, Kunal Jha, **Shivam Aarya**, Joshua B Tenenbaum, Antonio Torralba, and Tianmin Shu. GOMA: Proactive embodied cooperative communication via goal-oriented mental alignment. In *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 7099–7106. IEEE, 2024, #Citations: 18.

[4] **Shivam Aarya**. Towards increasing the robustness of predictive steering-control autonomous navigation systems against dash cam image angle perturbations due to pothole encounters. *arXiv preprint arXiv:2310.03959*, 2023.

Research Experiences

Undergraduate Embodied AI Researcher, Johns Hopkins University Jan 2024 - Present

- Conducting research under Prof. Tianmin Shu in the SCAI lab.
- Contributions led to two publications co-authored with Prof. Josh Tenenbaum and Prof. Antonio Torralba.

High School Student Researcher, The University of Memphis Nov 2021 - May 2023

- Researched autonomous steering control algorithms for pothole avoidance as a member of the *Socio-Technical Autonomous Resilient Systems (STARS)* Lab.
- Led to a publication on autonomous vehicle navigation and control.

Research & Teaching Assistantships

Research Assistant, Massachusetts Institute of Technology (MIT) Fall'25 - Present
- Developing Cog-Gym, a platform to standardize and host hundreds of online human–agent interaction studies in Prof. Josh Tenebaum's research group.

Course Assistant, Johns Hopkins University Spring'25
- Assisting Prof. Simon Leonard in teaching the course *Algorithms for Sensor-Based Robotics* (EN.601.463/663).

Reviewing Experiences

Reviewer, ICRA, WRL@ICLR, IROS, RA-L 2025

Startup Experiences

Co-Founder, Dayli – Spark Accelerator, Pava Center Oct 2024 - Present
- Building an app to bring physical interactions and memories back to our lives in the social media age
- https://www.dayli.social/

Co-Founder, Aspire – Spark Accelerator, Pava Center Jul 2024 - Present
- Building AI-driven tools for pre-medical students to apply to medical school
- https://www.aspiredoctor.com/

Co-Founder, Surgery Scheduling System – Johns Hopkins University Oct 2024 - Present
- Building a system to optimally schedule surgeries and organ transfers
- Won the HOUR catalyst award for $1,000
- Co-developing it with a Hospital system in Brazil for deployment and field testing

Technical Projects

HopHacks, Johns Hopkins University Sep 2023
- In 36 hours, rapidly developed a computer vision AI model for smartphones to generate alerts if any item is left in a patient's body during surgery by mistake (https://devpost.com/software/countability)
- Most decorated project with three prizes worth $1,506

Head Pose Angle Estimation for Game Controller, University of Memphis Jan 2022 - May 2022
- For the final project in the Intro to AI course, trained a computer vision AI model to estimate head pose angles of users from a webcam so they can use head movements to play games, especially for those with limited hand mobility

Psychoanalytic Prediction Modeling, Stanford Universiy Jun 2022 - Aug 2022
- For the final project in the Statistical Data Mining course, created statistical data mining models of psychopathology data to phenotype patients and predict the effect of pharmacological treatment

Robotics logger, WSHS Robotics Sep 2021 - Present
- Developed and deployed both cloud and client side to log attendance of team members; In use for 3+ years

Coursework

Johns Hopkins University, Undergraduate — Aug 2023 - present

Fall 2025

- AS.110.405 - Real Analysis
- EN.601.465 - Natural Language Processing
- EN.601.482 - Machine Learning: Deep Learning
- AS.371.152 - Intro Digital Photography
- EN.601.104 - Computer Ethics

Spring 2025

- AS.110.302 - Differential Equations and Applications
- EN.530.646 - Robot Devices, Kinematics, Dynamics, and Control
- EN.553.385 - Introduction to Computational Mathematics
- EN.601.433 - Intro Algorithms
- EN.601.475 - Machine Learning

Fall 2024

- AS.220.106 - Introduction to Fiction & Poetry II
- EN.553.361 - Intro to Optimization
- EN.553.430 - Mathematical Statistics
- EN.601.124 - The Ethics of Artificial Intelligence and Automation
- EN.601.463/663 - Algorithms for Sensor-Based Robotics

Spring 2024

- AS.110.201 - Linear Algebra
- AS.220.105 - Introduction to Fiction & Poetry I
- EN.553.420 - Probability
- EN.601.229 - Computer System Fundamentals
- EN.601.277 - Disinformation Self-Defense

Fall 2023

- AS.110.202 - Calculus III
- EN.500.111 - HEART: Introduction to Deep Learning for Medical Imaging
- EN.601.220 - Intermediate Programming
- EN.601.226 - Data Structures
- EN.601.230 - Mathematical Foundations for Computer Science

Stanford University, Summer Session, GPA: 4.081 — Jun 2022 - Aug 2022

Summer 2022

- CS 106B - Programming Abstractions
- CS 193C - Client-Side Internet Technologies
- MATH 51 - Linear Algebra, Multivariable Calculus, and Modern Applications
- STATS 202 - Data Mining and Analysis

University of Memphis, Dual Enrollment, GPA: 4.0 — Aug 2021 - May 2022

Spring 2022

- COMP 4/6720 - Intro to Artificial Intelligence

Fall 2021

- COMP 2700 - Discrete Structures

Technical Skills

Programming: Unix, Neovim, Nix, Python, ROS, Java, C, C++, JS, HTML, CSS, R, MatLab, Julia

Hobbies

Piano, Digital Photography, Running, Table Tennis, Home Lab