Vishwas Sathish

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Paul G. Allen School of Computer Science & Engineering, Seattle, WA 98195

Education

University of Washington, Seattle *2021 - Present*
PhD student in Computer Science and Engineering (Advisor: Rajesh P.N. Rao)

PES University, Bangalore *2015 - 2019*
B.Tech in Computer Science and Engineering (Advisors: Rajiv Bajpai & Bhaskarjyoti Das)

Work Experience

Paul G. Allen School of Computer Science and Engineering *Jan 2022 - Present*
Graduate Research Assistant | Pytorch, Jax, Tensorflow, Habitat-Lab, Mujoco, Maniskill, Gymnasium
Advisor: Rajesh P.N. Rao
Focus: Sequence Models, Reinforcement Learning, Representation Learning, Vision-Language Models

- **Masked Composer**: Distilled Vision-Language Models (VLMs) to mask away task-irrelevant attributes in Visual RL. These models are highly generalizable and scale to multi-modal control tasks.
- **Active Predictive Coding**: Hierarchical world models and policies to solve multi-modal navigation tasks such as Habitat 2.0. Published in Robotics Science and Systems and Neural Computation, 2024.

Amazon (A9), Palo Alto *June 2025 - Dec 2025*
Applied Scientist Intern | Multimodal models, RL finetuning, vLLM, ray, pytorch, AWS
Advisors: Douglas Gray & Arnab Dhua
Worked with the multi-modal search team at Palo Alto, CA. **Finetuned Qwen** family of models with novel RL algorithm built on **GRPO** technique for Visual Question Answering (VQA). Solved multi-hop VQA with search and tool use.

SensAI Healthcare (7sugar), Bangalore (Website) *July 2019 - June 2021*
Machine Learning Engineer | Tensorflow, Keras, Numpy, Plotly, Javascript, asyncio
Mentors: Adhi Kesarla & Rajesh Rao
Focus: Computer Vision, Hands-on Product Deployment, Autoregressive Forecasting, and Dialog Agents

- **Vision**: Deployed a real-time calorie estimator and meal classifier for more than 200 varieties of food, reducing the inference time from 5 minutes to 0.5 seconds. Received the TIDE 2.0 Start-up Grant for this project.
- **Forecasting**: Trained and deployed a state-of-the-art real-time GRU-Decay RNN for auto-regressive glucose forecasting with missing data. My work was presented at the Diabetes India Conference, 2020.

Morgan Stanley, Bangalore *Jan 2019 - July 2019*
Technology Analyst Intern | Data Transformation, Java, Javascript, Angular, Spring Framework
Worked on data routing and transformation using Apache Camel for Machine Learning pipelines. The software was used by multiple services within the organization, including a responsive website that I designed to search and query financial data.

Systems Biology Institute, Tokyo (Website) *July 2018 - Sept 2018*
Summer Research Intern | Python, Scikit-learn, Numpy, Pandas
Mentors: Vipul Gupta & Ayako Yachi
Built an Explainable Machine Learning Framework for Drug Classification and Discovery. The framework explained why a particular output class was chosen for a given set of drug compositions.

Skills

Tools: Pytorch, Tensorflow, Huggingface transformers, vLLM, TRL, veRL, Numpy, Scikit-Learn, Pandas, AWS, Docker, Ray, Slurm, Git, Bash, Python, C/C++, Java, Javascript, Typescript, HTML/CSS, LaTeX
Expertise: Large Langauge Models, Multi-modal LLMs, Reinforcement Learning, RL-Finetuning, Vision Transformers, World Models, Unsupervised Representation Learning, State Space Models, Planning and Navigation

Patents

1. **Apparatuses, Systems, and Methods for Active Predictive Coding Networks** *2024*
Full US Patent 2024 (Serial Number: 18/408,173). Patent Pending. Google Patents Link
Rajesh Rao, Dimitrios C. Gklezakos, **Vishwas Sathish**

Academic Publications

1. **Eliciting Self-Verification in Multimodal Reasoning Agents with Reinforcement Learning**
   Vishwas Sathish, Viresh Ranjan, Xinliang Zhu, Arnab Dhua, Douglas Gray.
   Accepted @ ECCV 2026

2. **Multimodal Natural Intelligence through Active Predictive Coding** (paper)
   Vishwas Sathish*, Jeffrey Duan*, Rajesh Rao
   Published @ AAAI 2026, Neuro for AI & AI for Neuro

3. **Active Predictive Coding: A Unifying Model for Compositional Learning and Hierarchical Planning**
   Rajesh Rao, Dimitrios C. Gklezakos, **Vishwas Sathish**.
   Published @ Neural Computation, 2024 (Paper)
   Presented @ Proceedings of the Annual Meeting of the Cognitive Science Society (Cogsci), 2023 (Poster)

4. **Learning Hiearchical Abstractions of Complex Dynamics via Prediction Errors**
   Vishwas Sathish, Rajesh Rao.
   Presented @ Robotics Science and Systems (RSS) 2024, Priors4Robots Workshop (workshop) (paper)
   Poster @ Connectome 2024 (Poster)

5. **Decoding Pain: Statistical Identification of Biomarkers from Electrophysiological Signals**
   Sidharth*, **Vishwas Sathish***, Shweta Bansal, Samantha Sun, Timmy Pham, Rajesh Rao, Jefferey Herron.
   Presented @ AAAI 2025, Workshop on Health Intelligence (website)

Preprints and Relevant Projects

1. **Masked Composer: Masked Model-Based RL for Compositional Generalization** *2025*
   Vishwas Sathish, Matthew James Bryan, Sidharth, Rajesh P. N. Rao

2. **LLeMpower: Understanding Disparities in the Control and Access of LLMs** (arxiv preprint) *2024*
   Vishwas Sathish, Hannah Lin, Aditya K Kamath, Anish Nyayachavadi.

3. **Lessons from Neuroscience: How integrating Compositional Structure and Episodic Memory could enable Human-Like AI** (arxiv preprint) *2024*
   Rajesh Rao, **Vishwas Sathish**, Preston Jiang, Matthew Bryan, Prashant Rangarajan

4. **Examining Large Language Model Cognition Through Puzzles and Optical Illusions**. (Paper) *2023*
   Vishwas Sathish, Aditya Kamath, Raphael Bechtold

5. **Graph Embedding Based Hybrid Social Recommendation System** (Paper) *2019*
   Vishwas Sathish, Tanya Mehrotra, Simran Dhinwa, Bhaskarjyoti Das

Professional Responsibilities

- **Academic Review Service** - ICML 2026, ICLR 2025-2026, Neurips 2025, ICCV 2025, RSS 2024 *2024 - 2026*
- **Graduate Application Reader** (ML/Neural Computing Track), Paul G. Allen School of CSE *2022 - 2025*
- **Student Area Chair** (Neural Computing Track): PhD Admissions, Paul G. Allen School of CSE *2022*
- **Pre-Application Mentorship Service, Mentor** (PAMS), Paul G. Allen School of CSE *2022*
- **Graduate Teaching Assistant** (UW CSE 421), Paul G. Allen School of CSE *2021*
- **Mentoring** - Sidharth (CS PhD, UMichigan), Jeffrey Duan (Incoming CS PhD @ UW), Yubo Zhang (PhD @ UW)

Awards and Achievements

- **ACM ICPC**: Bagged Rank 1 at the institution level ACM-ICPC and represented PES University at the regional contest in Chennai. Two-time top 10 rank in ICPC Pacific NW Qualifiers. *2018, 2022, 2023*
- **TIDE 2.0 Startup Grant**: Received the grant for my work on meal classification at SensAI Healthcare. *2019*
- 2 time recipient of **CNR Rao Metrit Scholarship** awarded by PES University for academic excellence. *2017, 2018*
- **SOF Science Olympiad**: Gold Medalist with a state rank of 14 and international rank 410. *2015*
- Among **Top 0.4%** of 150,000 candidates appearing in the 2015 KCET Examinations. *2015*
- Among **Top 1%** of 1,300,000 students appearing in the 2015 JEE Mains Examinations. *2015*