ANAND GOPALAKRISHNAN

+1 617-397-8429 ◇ 15 Chester Street Apt 33, Cambridge, 02140, MA, USA

Email ◇ LinkedIn ◇ Website ◇ Google Scholar

OBJECTIVE

I am a Postdoctoral Fellow in AI and Cognitive Science at Harvard University working with Yilun Du and Sam Gershman. I completed my PhD in Computer Science at IDSIA working with Jürgen Schmidhuber. My PhD work addressed a fundamental challenge in AI: building systems that can discover and manipulate compositional structure in the way humans do by efficiently learning reusable concepts and combining them flexibly to solve novel problems. Broadly interested in deep learning, self-supervised learning and reinforcement learning. Currently seeking full-time Research Scientist roles in AI/ML.

EDUCATION

PhD in Informatics, Università della Svizzera Italiana (USI Lugano) 2019-2025

MS in Electrical Engineering, Pennsylvania State University 2017-2019

BTech in Electrical Engineering, National Institute of Technology Karnataka (NITK) 2012-2016

SELECTED PUBLICATIONS

- **A Gopalakrishnan**, R Csordás, J Schmidhuber, MC Mozer, "Decoupling The "What" and "Where" With Polar Coordinate Positional Embedding", *ArXiv preprint arXiv:2509.10534*, 2025.
- E Littwin, V Thilak, **A Gopalakrishnan**, "Enhancing JEPAs with Spatial Conditioning: Robust and Efficient Representation Learning", *Workshop on Self-Supervised Learning, NeurIPS*, 2024.
- **A Gopalakrishnan**, A Stanić, J Schmidhuber, MC Mozer, "Recurrent Complex-Weighted Autoencoders for Unsupervised Object Discovery", *Neural Information Processing Systems (NeurIPS)*, 2024.
- K Irie, **A Gopalakrishnan**, J Schmidhuber, "Exploring the Promise and Limits of Real-time Recurrent Learning", *International Conference on Learning Representations (ICLR)*, 2024.
- A Stanić*, **A Gopalakrishnan***, K Irie, J Schmidhuber, "Contrastive Training of Complex-Valued Autoencoders for Object Discovery", *Neural Information Processing Systems (NeurIPS)*, 2023.
- J Gha, V Herrmann, B Grewe, J Schmidhuber, **A Gopalakrishnan**, "Unsupervised Musical Object Discovery from Audio", *Machine Learning for Audio Workshop, NeurIPS*, 2023.
- **A Gopalakrishnan**, K Irie, J Schmidhuber, S van Steenkiste,"Unsupervised Learning of Temporal Abstractions using Slot-based Transformers", *Neural Computation, 35(4), 593-626*, 2023.
- M Zhuge, H Liu, F Faccio, DR Ashley, R Csordás, **A Gopalakrishnan**, A Hamdi, H Hammoud, V Herrmann, K Irie, L Kirsch, B Li, G Li, S Liu, J Mai, P Piekos, A Ramesh, I Schlag, W Shi, A Stanić, W Wang, Y Wang, M Xu, DP Fan, B Ghanem, J Schmidhuber, "Mindstorms in Natural Language-based Societies of Mind", *Computational Visual Media*, 2023. **Best paper award at R0-FoMo NeurIPS Workshop 2023**
- **A Gopalakrishnan**, S van Steenkiste, J Schmidhuber, "Unsupervised Object Keypoint Learning using Local Spatial Predictability", *International Conference on Learning Representations (ICLR),* 2021. **Spotlight**
- **A Gopalakrishnan**, A Mali, D Kifer, C.L Giles and A.G Ororbia, "A Neural Temporal Model for Human Motion Prediction" *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019.

EXPERIENCE

Research Intern June 2024 - September 2024

Apple *Cupertino, CA*

Designed architecture and pretraining improvements to Joint Embedding Predictive Architectures (JEPAs).

Applied Scientist Intern June 2022 - November 2022

Amazon AWS AI Lab *Tübingen, Germany*

Investigated object-centric world models for interventional and counterfactual predictions.

Research Assistant June 2016 - April 2017
Indian Insitute of Science (IISc Bangalore) *Bangalore, India*
Contributed to Indic-TTS project. A Text-to-Speech system for Indian Languages.

Summer Intern May 2015 - August 2015
University of Waterloo *Waterloo, Canada*
Designed ML model for Glaucoma detection from retinal fundus images.

AWARDS & HONORS

- Awarded compute grant of 150,000 GPU hours from Swiss National Supercomputing Centre for the project *Scaling Synchrony-based Models for Visual Binding* 2024.
- Selected for the Brains, Minds and Machines summer school 2023 by MIT Center for Brains, Minds and Machines.
- Awarded compute grant of 200,000 GPU hours from Swiss National Supercomputing Centre for the project *Learning Structured World Models for Visual Perception and Reasoning* 2020.
- Awarded NeurIPS D&I Travel award 2019.
- Awarded National Talent Search Examination Scholarship 2008. A competitive national-level scholarship given to 1000 high-school students in India.

SKILLS

Programming Languages	Python, LaTeX, MATLAB, Bash
Frameworks and Tools	PyTorch, TensorFlow, Keras, Numpy, Scipy, Scikit-learn, OpenCV, Pandas, Git, Markdown, Inkscape
Technical Skills	Deep learning, Self-supervised learning, Reinforcement learning, Transformers, World models, LLMs, VLMs, Multimodal perception
Miscellaneous	Scientific Writing, Public Speaking, Analytical Skills, Organization, Visual Art

PROFESSIONAL ACTIVITIES

Reviewing

- Conferences: ICLR 2022 | NeurIPS 2022, 2023 | ICML 2023
- Journals: Neural Computation
- Workshops: Elements of Reasoning: Objects, Structure and Causality at ICLR 2022 | Object Representations for Learning and Reasoning at NeurIPS 2020 | Meta-Learning Workshop at NeurIPS 2019

Teaching

- Course: Graduate-level Machine Learning at USI Lugano. Designed lectures, tutorial sessions and assignments for unsupervised learning and probabilistic learning modules.

SUPERVISION

Joonsu Gha (Master's thesis) August 2022 - August 2023
Title: Learning Structured Music Representations from Audio Data
Now: PhD in Neuroscience & Machine Learning at ETH Zurich