

RESEARCH STATEMENT

I am broadly interested in figuring out how to implement human level visual (perception and cognition) generalization in silicon.

EDUCATION

- **Indian Institute of Technology, Hyderabad** Kandi, India
 - *Research based Masters in Artificial Intelligence (8.3/10)* *Jan. 2024 - Ongoing*
 - **Computer Vision with limited Supervision:** Ongoing research efforts on measuring the capability of vision transformers as syntactic reasoners through a mechanistic lens.
- **Birla Institute of Technology and Science** Pilani, India
 - *M.Sc.(Hons.) Physics and B.E.(Hons.) Manufacturing Engineering (6.05/10)* *Aug. 2016 - March 2021*

PUBLICATIONS

- Where does an LLM begin Computing an Instruction? *UniReps Workshop, NeurIPS '25*
Aditya Pola, Vineeth N. Balasubramanian arXiv
- LogicCBMs: Logic-Enhanced Concept-Based Learning *WACV '26*
Deepika Vemuri, Gautham Bellamkonda, Aditya Pola, Vineeth N. Balasubramanian arXiv

EXPERIENCE

- **Indian Institute of Technology, Hyderabad** Hyderabad, India
 - *Research Associate under Prof. Vineeth N Balasubramanian* *January 2023 - December 2023*
 - **Computer Vision with limited Supervision:** Carrying out research on Object-centric methods as a means to compositionality and out-of-distribution generalization
- **Ivy** London, Remote
 - *Research Engineer Intern* *September 2022 - December 2022*
 - **Framework Transpiler:** Carried out the initial design process of a transpiler that would enable transpilation of code between various deep learning frameworks. This was adopted into applying for the Innovate UK Smart Grant.
- **Happymonk AI Labs** Bangalore, India
 - *Data Scientist* *July 2021 - January 2022*
 - **Face Recognition Project:** Improved in-house facial recognition algorithms by implementing margin based softmax methods in distributed training settings with a test accuracy of 95.72% on a large database of faces.
- **Saama Technologies** Chennai, India
 - *Intern at the research team* *December 2018 - January 2019*
 - **AutoML and Generative networks:** Contributed to the AutoML project by researching active learning-based hyperparameter optimization methods and assisting in the in-house implementation of variational autoencoders.
- **Tata Institute of Fundamental Research** Mumbai, India
 - *Masters Thesis under Prof. Shri Ganesh Prabhu* *July 2020- March 2021*
 - **Optimization algorithms:** Developed and compiled data-driven optimization techniques like Nelder-Mead, Basin hopping to solve for optical parameters of materials under Time-Domain-Spectroscopy.

CONFERENCE ENGAGEMENTS

- **ACML 2022:** Student volunteer
- **Sub-reviewed conferences:** NeurIPS '24, ICLR '24, NeurIPS '23

OPEN SOURCE CONTRIBUTIONS

- **PettingZoo**: Contributed to major version update. Rewrote an existing multi-agent RL environment using Pymunk as the physics engine.

TEACHING AND OTHERS

- TA for AI5100: Deep Learning
- Compute admin for the resources of Lab1055 managing 15+ servers

RELEVANT COURSEWORK

Interpretability in AI, Deep Learning, Foundations of Machine Learning, Statistical Mechanics

TECHNICAL SKILLS

- **Programming Languages**: Python, C, MATLAB, HTML, CSS, L^AT_EX
- **Deep-learning Frameworks**: Pytorch, torch.distributed
- **Production Frameworks**: Kafka, NATS, FAISS