Samarth Mishra

Curriculum Vitae

Waymo
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Education

2019-2024 **PhD**, *Computer Science.*
Boston University — Boston, MA
Advisors: ***Prof. Venkatesh Saligrama & Prof. Kate Saenko***

2017-2019 **Master of Science**, *Computer Science.*
Georgia Institute of Technology — Atlanta, GA
Specializing in Machine Learning
Advisor: ***Prof. James M. Rehg***

2013-2017 **Bachelor of Technology with Honors**, *Computer Science and Engineering.*
Indian Institute of Technology, Bombay — Mumbai, India
Minor in Electrical Engineering
GPA: **9.46**/10 Minor GPA: 9.5/10

Research Interests

Computer Vision, Machine Learning, Large Multimodal Models, Synthetic Data

Work Experience

Software Engineer, *Dec 2024-Present.*
Waymo LLC.
Developing vision language models for Waymo's self-driving car.

Applied Scientist Intern, *Jun 2023-Sep 2023.*
AWS—Amazon One
Explored the use of large scale text-to-image generative models for synthetic data in cross-domain retrieval problems.

Research Intern and Student Researcher, *May 2021-May 2023.*
MIT-IBM Watson AI Lab
Explored properties of good synthetic data for pre-training representations for transfer to downstream visual recognition tasks. Works published at CVPR'22, NeurIPS'22 & NeurIPS'23.

Member of Technical Staff Intern, *May 2018-Aug 2018.*
Nutanix Inc., San Jose, CA
Researched techniques and developed a system for handling natural language queries on a subset of Nutanix's multi-cluster management database using semantic parsing and machine learning

Publications

H. Zhong, **Samarth Mishra**, D. Kim, S. Jin, R. Panda, H. Kuehne, L. Karlinsky, V. Saligrama, A. Oliva and R. Feris. Learning Human Action Recognition Representations Without Real Humans. *Advances in Neural Information Processing Systems*, 2023.

Y. Kim, **Samarth Mishra**, R. Panda, C. P. Phoo, C.F. Chen, L. Karlinsky, K. Saenko, V. Saligrama, and R.S. Feris. How Transferable are Video Representations Based on Synthetic Data? *Advances in Neural Information Processing Systems*, 2022.

Samarth Mishra, R. Panda, C. P. Phoo, C.F. Chen, L. Karlinsky, K. Saenko, V. Saligrama, and R.S. Feris. Task2Sim: Towards Effective Pre-training and Transfer from Synthetic Data. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, pp. 9194-9204. 2022.

Samarth Mishra, P. Zhu, and V. Saligrama. Interpretable Compositional Representations for Robust Few-Shot Generalization. *IEEE Transactions on Pattern Analysis and Machine Intelligence* (2022).

D. Bashkirova, D. Hendrycks, D. Kim, H. Liao, **Samarth Mishra**, C. Rajagopalan, K. Saenko, K. Saito, B. U. Tayyab, P. Teterwak, and B. Usman, 2022, July. VisDA-2021 Competition: Universal Domain Adaptation to Improve Performance on Out-of-Distribution Data. *In NeurIPS 2021 Competitions and Demonstrations Track* (pp. 66-79). PMLR.

Samarth Mishra, K. Saenko, V. Saligrama. Surprisingly simple semi-supervised domain adaptation with pretraining and consistency. *British Machine Vision Conference*, 2021.

Samarth Mishra, Z. Zhang, Y. Shen, R. Kumar, V. Saligrama, and B. Plummer. Effectively leveraging attributes for visual similarity. *In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, pages 3904–3909, 2021.

D. Kim, K. Saito, **Samarth Mishra**, S. Sclaroff, K. Saenko, and B. Plummer. Self-supervised visual attribute learning for fashion compatibility. *In Proceedings of the IEEE/CVF International Conference on Computer Vision*, pages 1057–1066, 2021

P. Zhu, R. Zhu, **Samarth Mishra**, and V. Saligrama. Low dimensional visual attributes: An interpretable image encoding. *In International Conference on Pattern Recognition*, pages 90–102. Springer, 2021.

S. Stojanov, **Samarth Mishra**, N. A. Thai, N. Dhanda, A. Humayun, C. Yu, L. B. Smith,and J. M. Rehg. Incremental object learning from contiguous views **(Oral)**. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* pages 8777–8786, 2019.

K. Chatterjee, B. Kragl, **Samarth Mishra**, and A. Pavlogiannis. Faster algorithms for weighted recursive state machines. In *European Symposium on Programming*, pages 287–313. Springer, 2017.

Preprints

Samarth Mishra, C. Castillo, H. Wang, K. Saenko, V. Saligrama. SynCDR : Training Cross Domain Retrieval Models with Synthetic Data. *Pre-print*, 2023.

Fellowships and Awards

Awards
- **Institute Academic Prize**, IIT Bombay — 10 students in a batch of 880 — 2014
- **All India Rank 30** in JEE-Main among 1.3 million candidates — 2013
- Gold medal, **Indian National Physics Olympiad** — ***top 35*** in India — 2013
- Indian National **Chemistry and Astronomy** Olympiads — top 1% in India — 2013

Fellowships
- **Dean's Fellowship**, Boston University — 2019
- **PM's Trophy Scholarship**, awarded by Steel Authority of India Ltd. — 2013-17
- Kishore Vaigyanik Protsahan Yojana (**KVPY**) scholar : **All India Rank 27** — 2012-13
- National Talent Search Examination (**NTSE**) scholar — 2009-12

Teaching

Boston University

Spring 2020 — CS 591 : *Deep Learning* — *Instructor: Prof. Kate Saenko*

Georgia Tech

Spring 2019	CS 6601 : *Artificial Intelligence*	*Instructor: Prof. Thad Starner*
Fall 2018	CS 6601 : *Artificial Intelligence*	*Instructor: Prof. Thad Starner*
Spring 2018	CS 3600 : *Intro to Artificial Intelligence*	*Instructor: Prof. James M. Rehg*

IIT Bombay

Spring 2017	CS 224 : *Computer Networks*	*Instructor: Prof. Varsha Apte*
Fall 2015	CS 101 : *Intro to Computer Programming*	*Instructor: Prof. Varsha Apte*
Spring 2015	MA 106 : *Linear Algebra*	*Instructor: Prof. Manoj K. Keshari*

Leadership and Organizational Experience

2022 **VisDA22 Competition : ZeroWaste Segmentation challenge**.
Part of the NeurIPS'22 competition organizing team.

2021 **VisDA21 Competition : Universal Domain Adaptation**.
Part of the NeurIPS'21 competition organizing team.

2016-17 **Department Placement Coordinator, IIT Bombay**.
Organized and ensured smooth execution of department level placement preparation activities and assisted students at all stages of the placement procedure.

Reviewer

WACV-2021, AAAI-2021, CVPR-2021, ECCV-2022, NeurIPS-2022

Relevant Coursework

BU	Towards Universal Natural Language Understanding, Reinforcement Learning, Statistical Learning Theory
Georgia Tech	Machine Learning, Numerical Linear Algebra, Machine Learning Theory
IIT Bombay	Advanced Machine Learning (Probabilistic Graphical Models and Deep Learning), Algorithms in Medical Image Processing, Digital Image Processing, Foundations of Learning Agents