

# Samarth Mishra

## Curriculum Vitae

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## Education

- 2019-Present **PhD Student**, *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**  
GPA : **4.0/4.0**
- 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

## 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	<ul style="list-style-type: none"> <li>○ <b>Institute Academic Prize</b>, IIT Bombay — 10 students in a batch of 880 2014</li> <li>○ <b>All India Rank 30</b> in JEE-Main among 1.3 million candidates 2013</li> <li>○ Gold medal, <b>Indian National Physics Olympiad</b> — <b>top 35</b> in India 2013</li> <li>○ Indian National <b>Chemistry and Astronomy</b> Olympiads — top 1% in India 2013</li> </ul>
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Fellowships	<ul style="list-style-type: none"> <li>○ <b>Dean’s Fellowship</b>, Boston University 2019</li> <li>○ <b>PM’s Trophy Scholarship</b>, awarded by Steel Authority of India Ltd. 2013-17</li> <li>○ Kishore Vaigyanik Protsahan Yojana (<b>KVPY</b>) scholar : <b>All India Rank 27</b> 2012-13</li> <li>○ National Talent Search Examination (<b>NTSE</b>) scholar 2009-12</li> </ul>
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## Experience

Summer **Applied Scientist Intern.**

2023 *AWS—Amazon One*

Explored the use of large scale text-to-image generative models for synthetic data in cross-domain retrieval problems.

Summer **Research Intern.**

2021, 2022 *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.

2019-Present **Graduate Student Researcher.**

*Boston University*

Research on visual domain adaptation, few-shot and zero-shot recognition and image similarity metric learning in collaboration with Profs. Venkatesh Saligrama, Bryan Plummer and Kate Saenko.

2017-2019 **Graduate Student Researcher.**

*Georgia Institute of Technology*

Worked on incremental learning and 3D shape representations. For the former, introduced a new synthetic data generating environment and a 3D object dataset—appeared as an oral presentation at CVPR, 2019.

Summer **MTS Intern—Machine Learning.**

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

Fall 2016 **Bachelor's Thesis.**

*IIT Bombay*

Developed a kernel dictionary learning method on spherical manifolds for application to image classification and denoising tasks.

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## 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*

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## 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.

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## Reviewer

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

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## 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