

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

Interests

Computer Vision, Machine Learning

Publications and Preprints

- Samarth Mishra, K. Saenko, and 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. Bashkirova, D. Hendrycks, D. Kim, Samarth Mishra, K. Saenko, K. Saito, P. Teterwak, and B. Usman. Visda-2021 competition universal domain adaptation to improve performance on out-of-distribution data. *NeurIPS, 2021 Competitions Track*.
- 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**). In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 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.

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

Experience

Summer **Research Intern.**

2021 *MIT-IBM Watson AI Lab*

Explored properties of synthetic pretraining data for transfer learning in image classification and developed a method for automatically recognizing these for different downstream tasks.

2019-Present **Graduate Student Researcher.**

Boston University

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

2017-2019 **Graduate Student Researcher.**

Georgia Institute of Technology

Guided by : Prof. James M. Rehg

- **Incremental Object Learning**: Introduced a new synthetic data generating environment and a 3D object dataset for incremental object learning. Established the importance of repetition in mitigating catastrophic forgetting. Paper accepted for oral presentation at CVPR 2019.
- **Discriminative 3D Shape Representations** : Worked on learning discriminative and generalizable 3D shape representations via the task of learning single view 3D object reconstruction.

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, and a method for easy annotation of data

Fall 2016 **Bachelor's Thesis.**

IIT Bombay

Guided by: Prof. Suyash P. Awate

Developed a kernel dictionary learning method on spherical manifolds for application to image classification and denoising tasks. Explored regularizations for classification robustness to different kinds and intensities of image noise.

Summer **Software Engineering Intern.**

2016 *Samsung HQ, Seoul, Korea*

Developed a Tizen3.0 application for process monitoring via log parsing. Features include a user friendly UI, notification alerts, active response to misbehaving processes and capability for easy integration into Samsung's smart home server.

Fall 2015 **RnD Project.**

IIT Bombay

Guided by: Prof. Krishna S.

On equilibria in sequential non-competitive multiplayer games on timed automata. Considering only memoryless player strategies, proved undecidability of the existence of a cost bounded Nash, Stackelberg or Incentive equilibrium in a 2 player sequential timed game with 3 clocks.

Summer **Visiting Student Researcher.**

2015 *IST Austria*

Guided by: Prof. Krishnendu Chatterjee

Implemented weighted Recursive State Machines (RSMs) and the proposed fast reachability algorithms. Empirically demonstrated, on the SLAM/SDV benchmarks, algorithmic speed improvements over jMoped, a tool for interprocedural analysis. Work published in ESOP'17.

Teaching Experience

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*

Other Academic Projects

Spring 2018 **GPGPU solutions for Linear Least Squares Problem.**

Guided by: Prof. Haesun Park

Implemented three general purpose GPU solutions for the linear least squares problem—Householder QR decomposition, Cholesky decomposition and Givens QR decomposition— and their CPU counterparts for comparison on a 2D pose graph optimization problem solvable by Newton’s method

Spring 2017 **Medical Image Segmentation : DeepCut.**

Guided by: Prof. Suyash P. Awate

Implemented DeepCut segmentation algorithm for finding segmentation of the heart from human chest MR images, using user-input bounding box annotations. Used an iterative procedure of fuzzy pixel mask generation using a conv net and refinement using a dense conditional random field (CRF)

Fall 2016 **Reinforcement Learning : Carrom playing bot.**

Guided by: Prof. Shivaram Kalyanakrishnan

Implemented and evaluated three approaches of building a carrom playing bot — deep Q-learning, deep deterministic policy gradients and using hand-coded heuristics

Technical Skills

Languages Python | C | C++ | Java | MATLAB | Bash | HTML | Javascript | CSS | \LaTeX 2 ϵ
Technologies PyTorch | Tensorflow | Blender | Numpy | CUDA | Hadoop | Pig | Spark | D3 | Elasticsearch

Relevant Coursework

BU Towards Universal Natural Language Understanding
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
Udacity Computer Vision, Deep Learning

Reviewer

WACV-2021, AAAI-2021, CVPR-2021