Samarth Mishra

Curriculum Vitae

1705 Commonwealth Ave
Apt 4
Brighton, MA-02135
+1 4045101164
samarthm@bu.edu
samarth4149.github.io

Education

2019-Present **PhD Student**, *Computer Science*.
Boston University — Boston, MA
Advisors: ***Prof. Derry Wijaya & 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

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

Stefan Stojanov, *Samarth Mishra*, Ngoc Anh Thai, Nikhil Dhanda, Ahmad Humayun, Chen Yu, Linda B. Smith, and James M. Rehg. Incremental object learning from contiguous views. In *The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2019.

Research Experience

2017-2019 **Graduate Student Researcher**.
Georgia Institute of Technology *Guided by : Prof. James M. Rehg*

- Developed a new synthetic data generating environment, called CRIB (Continual Recognition Inspired by Babies), for incremental object learning, coupled with a 3D object dataset of 200 unique objects, Toys-200, capable of modelling visual imagery seen during object exploration in early infancy
- Implemented three incremental learning algorithms and studied the effect of repeated exposures to concepts, across multiple datasets – CIFAR100, ShapeNet and Toys-200
- Introduced the paradigm of weak supervision in incremental learning and established a baseline solution through modification of an incremental learning algorithm.
- Paper accepted for oral presentation and one of the 50 best paper finalists at CVPR 2019

Fall 2016 **Bachelor's Thesis**.
IIT Bombay *Guided by: Prof. Suyash P. Awate*

- Implemented a kernel dictionary learning algorithm for data on spherical manifolds
- Demonstrated effective application in image denoising and image classification tasks
- Studied the effect of different regularizers and kernels, on robustness in classification performance of the algorithm, under different kinds and intensities of noise, on MNIST handwritten digits dataset

Fall 2015 **RnD Project**.
IIT Bombay *Guided by: Prof. Krishna S.*
- Studied different 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 (a result that trivially extends to more players or clocks)

Summer 2015 **Visiting Student Researcher**.
IST Austria *Guided by: Prof. Krishnendu Chatterjee*
- Wrote an implementation for weighted Recursive State Machines (RSMs) and the proposed fast reachability algorithms
- Empirically demonstrated, on the SLAM/SDV benchmarks, algorithmic speed improvements over jMoped, a leading tool for interprocedural analysis using pushdown system based algorithms
- Work published in ESOP'17

Achievements and Awards

- Awarded **Institute Academic Prize**, IIT Bombay—awarded to 10 students in a batch of 880 2014
- **All India Rank 30** in JEE-Main among 1.3 million candidates 2013
- Awarded Gold medal in **Indian National Physics Olympiad** for being among ***top 35*** in India 2013
- Among top 1% (300) students qualified for Indian National **Chemistry and Astronomy** Olympiads 2013
- **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

Industry Experience

Summer 2018 **MTS Intern–Machine Learning**.
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

Summer 2016 **Software Engineering Intern**.
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

Teaching Experience

Graduate Teaching Assistant

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

Undergraduate Teaching Assistant

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*

Key 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 C | C++ | Java | Python | MATLAB | Bash | HTML | Javascript | CSS | LaTeX 2$_\varepsilon$

Technologies PyTorch | Tensorflow | CUDA | Blender | Numpy | Hadoop | Pig | Spark | D3 | Elasticsearch

Relevant Coursework

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

References

- Prof. James M. Rehg
  Professor
  School of Interactive Computing
  Georgia Institute of Technology
  rehg@gatech.edu
- Dr. Ahmad Humayun
  Researcher
  Vicarious
  ahmadh@gatech.edu
- Prof. Suyash P. Awate
  Associate Professor
  IIT Bombay
  suyash@cse.iitb.ac.in
- Prof. Krishnendu Chatterjee
  Professor
  IST Austria
  krishnendu.chatterjee@ist.ac.at