

Nirbhay Modhe

CONTACT	PhD Student, advised by Prof. Dhruv Batra College of Computing, Georgia Tech	email: nirbhaym@gatech.edu nirbhayjm.github.io
EDUCATION	Georgia Tech , PhD in Computer Science IIT Kanpur , B. Tech in Computer Science, CGPA: 9.7/10	2017-present 2013-2017
PUBLICATIONS	Nirbhay Modhe , Harish Kamath, Dhruv Batra, Ashwin Kalyan. Model-Advantage and Measuring Generalization in Reinforcement Learning <i>pre-print, under review</i> (arXiv ↗) Nirbhay Modhe , Prithvijit Chattopadhyay, Mohit Sharma, Abhishek Das, Devi Parikh, Dhruv Batra, Ramakrishna Vedantam. IR-VIC: Unsupervised Discovery of Sub-goals for Transfer in RL <i>International Joint Conference on Artificial Intelligence, Yokohoma, Japan, 2020</i> (IJCAI20 ↗ , arXiv ↗) Vikas Jain*, Nirbhay Modhe* , Piyush Rai. Scalable Generative Models for Multi-label Learning with Missing Labels. <i>International Conference on Machine Learning (ICML)</i> , 2017 (pdf ↗)	
RESEARCH EXPERIENCE	Georgia Tech , Prof. Dhruv Batra & Prof. Devi Parikh Towards Smarter Q-Bots in Visual Dialog (video 🎥 , pres ↗) <ul style="list-style-type: none">• Explored ways of making the Questioner Bot ask more discriminative questions in the visual dialog task where two agents play a cooperative image-guessing game IIT Kanpur , Prof. Amitabha Mukerjee Reconstructing Unique Inversions for Deep Model of Motion <ul style="list-style-type: none">• Extended the Convolutional Chair Generation model by Dosovitsky et. al. for reconstructing poses of a 3 DOF robotic arm.• Obtained a labelled dataset of the CRS Robot Arm using 6 cameras and used the proposed CNN to learn the robot image representations. IIT Kanpur , Prof. Raghunath Tewari Probabilistic Polynomial Method in Circuit Complexity <ul style="list-style-type: none">• Studied the application of the probabilistic polynomial method by Ryan Williams in the All Pairs Shortest Path and Boolean Orthogonal Detection problem.• Proposed the application of this method to solve min-plus matrix multiplication faster by using the tensor product decomposition of the two matrices.	
INTERNSHIPS	SRI International , Giedrius Burachas Stochastic Video Prediction for Navigation <ul style="list-style-type: none">• Applied disentangled representations for stochastic video prediction in a virtual Unity3D environment and the KITTI dataset. University of Texas at Dallas , Prof. Vincent Ng Event Coreference Resolution <ul style="list-style-type: none">• Explored the use of recurrent neural networks for event coreference resolution	Summer 2018 Summer 2016
TEACHING EXPERIENCE	Teaching Assistant , Deep Learning, Georgia Tech <ul style="list-style-type: none">• Served as TA for CS 7643/4803 in Fall 2018 and Fall 2019.• Gave an introductory lecture on dynamic programming methods for solving MDPs and an introduction to Reinforcement Learning in Fall 2019. (RL slides pdf ↗)	

Tutor, Fundamentals of Computing (ESC101), IIT Kanpur

- Taught in weekly tutorial classes for ESC101 in Fall 2016 and Spring 2017.
- Recorded video lectures in Hindi and partly in English as a part of the course offering to aid students struggling with understanding English. ([YouTube playlist ↗](#))

**OPEN
SOURCE**

VisDial-RL in PyTorch, Prof. Dhruv Batra
[batra-mlp-lab/visdial-rl ↗](#)

July 2018

- Lead the open source project for implementing VisDial RL - *Learning Cooperative Visual Dialog Agents using Deep Reinforcement Learning* by Das and Kottur et. al., 2017, in PyTorch. ([Github ↗](#))

**COURSE
PROJECTS**

Generative Image Modelling using DRAW
Recent Advances in CV, Prof. Gaurav Sharma

July '16 - November '16
([code ↗](#))

- Analysed the generative RNN model “DRAW” by Gregor et. al. by experimenting with the parameters and design choices of the encoder-decoder framework on the MNIST and Street View House Numbers (SVHN) cropped dataset.
- Implemented and evaluated three new modifications to DRAW which incorporate convolutional features, supervised learning and fully convolutional networks on the MNIST dataset.

Image Colorization by Patch Inference
Computer Vision, Prof. Vinay Namboodiri

Jan '16 - April '16
([code ↗](#))

- Implemented and evaluate a novel image colorization model inspired by the idea of “Fast Direct Super-resolution by Simple Functions” by Yang et. al. The model learns to color images by training on the luminance and chrominance values of local patches.
- Evaluated the model on a set of scene images from the Sun Database.

Word Sense Disambiguation in Hindi
Artificial Intelligence, Prof. Amitabha Mukerjee

March '15 - April '15
([code ↗](#))

Perl Compiler
Compiler Design, Prof. Subhajit Roy

Jan '16 - April '16
([code ↗](#))

**ACADEMIC
ACCOLADES**

- Received **Academic Excellence Award** twice for outstanding academic performance (awarded to top 7% students in the institute) from 2013-15
- Received an **A* grade** in 8 courses (awarded to top 1-2% students in a course)
- Secured **All India Rank 414** (among 150,000 students) in JEE Advanced 2013
- Secured **All India Rank 313** (among 5,000,000 students) in JEE Mains 2013

REVIEWING

Served as a reviewer for ECCV 2018, CVPR 2019, ICLR 2019, ICLR 2020, AAAI 2020, NeurIPS 2020, ICLR 2021, NeurIPS 2021.

**TECHNICAL
SKILLS**

Languages : Python, Shell, C, C++, R, Matlab/Octave
Software & Tools : PyTorch, TensorFlow, \LaTeX , Git