Nirbhay Modhe

CONTACT Post-Doctoral Fellow
Nell Hodgson Woodruff School of Nursing, Emory University
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EDUCATION

Georgia Tech, Ph. D. in Computer Science 2017-2022
Thesis: "Leveraging Value-awareness for Online and Offline Model-based Reinforcement Learning" (**Dissertation**)

IIT Kanpur, B. Tech in Computer Science, CGPA: 9.7/10 2013-2017

PUBLICATIONS

Nirbhay Modhe, Qiaozi Gao, Ashwin Kalyan, Dhruv Batra, Govind Thattai, Gaurav Sukhatme. Exploiting Generalization in Offline Reinforcement Learning via Unseen State Augmentations *under review*

Nirbhay Modhe, Harish Kamath, Dhruv Batra, Ashwin Kalyan. Model-Advantage and Value-Aware Models for Model-Based Reinforcement Learning: Bridging the Gap in Theory and Practice *pre-print* (**arXiv**)

Nirbhay Modhe*, Harish Kamath*, Dhruv Batra, Ashwin Kalyan. Bridging Worlds in Reinforcement Learning with Model-Advantage *4th Lifelong Machine Learning Workshop at ICML 2020* (**PDF**)

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 *International Joint Conference on Artificial Intelligence, Yokohoma, Japan, 2020* (**IJCAI20** , **arXiv**)

Vikas Jain*, **Nirbhay Modhe***, Piyush Rai. Scalable Generative Models for Multi-label Learning with Missing Labels. *International Conference on Machine Learning (ICML),* 2017 **(PDF)**

EXPERIENCE

Emory University, Post-doc with Prof. Xiao Hu March, 2023 - Present
Machine learning and reinforcement learning applied to biomedical analysis and sequential decision making for medical treatment.

Amazon Alexa AI, Intern with Prof. Gaurav Sukhatme Summer 2022
Exploiting Generalization in Offline RL via Unseen State Augmentations.

- Motivated by exploiting the generalization capabilities of learnt models, we propose a novel strategy for finding states far from the seen data distribution in offline RL while also having low epistemic uncertainty.
- We demonstrate that perturbing seen states in the direction of increasing and decreasing estimated value, along with uncertainty filtering, significantly improves performance on several offline RL tasks and benchmarks.

SRI International, Intern with Giedrius Burachas Summer 2018
Stochastic Video Prediction for Navigation

- Applied disentangled representations for stochastic video prediction in a virtual Unity3D environment and the KITTI dataset.

University of Texas at Dallas, Intern with *Prof. Vincent Ng* Summer 2016
Event Coreference Resolution

- Explored the use of recurrent neural networks for event coreference resolution

OPEN SOURCE

VisDial-RL in PyTorch, Prof. Dhruv Batra — July 2018
batra-mlp-lab/visdial-rl
- 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**)

TEACHING EXPERIENCE

Teaching Assistant, Deep Learning, Georgia Tech
- 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 sturggling with understanding English. **(YouTube playlist)**

REVIEWING

Served as a reviewer for ECCV 2018, CVPR 2019, ICLR 2019, ICLR 2020, AAAI 2020, NeurIPS 2020, ICML 2021, ICLR 2021, NeurIPS 2021, ICLR 2022.

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

TECHNICAL SKILLS

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