

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”, advised by Prof. Dhruv Batra (**Dissertation** [↗](#))
IIT Kanpur, B. Tech in Computer Science, CGPA: 9.7/10 2013-2017
- MANUSCRIPTS** **Nirbhay Modhe**, Ran Xiao, Matthew Clark, Cheng Ding, Duc Do, Randall Lee, Timothy Ruchti, Xiao Hu. Time-Aware Deep Sequential Models for In-Hospital Code Blue Prediction using Monitor Alarms. *Accepted as extended abstract at IEEE EMBS International Conference on Biomedical and Health Informatics (BHI), 2023*
- Ran Xiao, Matthew Clark, **Nirbhay Modhe**, Cheng Ding, Delgersuren Bold, Timothy Ruchti, Xiao Hu. Characterizing trending features in time-series prediction of clinical event onset. *Accepted as extended abstract at IEEE EMBS International Conference on Biomedical and Health Informatics (BHI), 2023*
- Ran Xiao, Matthew Clark, Delgersuren Bold, Cheng Ding, **Nirbhay Modhe**, Timothy Ruchti, Xiao Hu. Assessing the Generalizability of Pre-trained Predictive Models for Hemorrhage, Emergent Intubation, and Sepsis to Predict In-hospital Cardiac Arrest. *2023 Computing in Cardiology (CinC)*
- Nirbhay Modhe**, Qiaozi Gao, Ashwin Kalyan, Dhruv Batra, Govind Thattai, Gaurav Sukhatme. Exploiting Generalization in Offline Reinforcement Learning via Unseen State Augmentations. *pre-print* (**arXiv** [↗](#))
- 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
Deep sequential machine learning for building foundation models as well as predictive models for prediction of cardiac end-points using vital signs, electronic health records and patient-monitoring alarms.

	Amazon Alexa AI , Intern with Prof. Gaurav Sukhatme Summer 2022 Exploiting Generalization in Offline RL via Unseen State Augmentations. (PDF) <ul style="list-style-type: none"> • 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 <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 , Intern with <i>Prof. Vincent Ng</i> Summer 2016 Event Coreference Resolution <ul style="list-style-type: none"> • 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 ↗ <ul style="list-style-type: none"> • Lead the open source project for implementing VisDial RL - <i>Learning Cooperative Visual Dialog Agents using Deep Reinforcement Learning</i> by Das and Kottur et. al., 2017, in PyTorch. (GitHub ↗)
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 <ul style="list-style-type: none"> • 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 ↗)
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	<ul style="list-style-type: none"> • 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