Mehul Damani

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Education

Ph.D. **Massachusetts Institute of Technology (MIT)** Aug 2022 – present
Ph.D. candidate in Computer Science
- **Advisor:** Jacob Andreas ; **GPA**: 4.8/5.0

B.Eng **Nanyang Technological University (NTU)** Aug 2018 – May 2022
Bachelor's in Mechnical Engineering
- **GPA**: 4.74/5.0 ; Honours (Highest Distinction)

Experience

New York University Remote
Research Intern (Advised by Lerrel Pinto) Jan 2021 – Aug 2022
- Developed curriculum generation method that improved performance by upto 20% on robotic tasks.

National University of Singapore Singapore
Research Intern (Advised by Guillaume Sartoretti) Apr 2020 – July 2022
- Developed decentralized reinforcement learning (RL) methods for multi-agent systems.
- Co-authored 4 papers, open-sourced code with 100+ stars on Github.
- Achieved fourth position in the RL track of the NeurIPS 2020 Flatland Challenge.

Satellite Research Centre (NTU) Singapore
Research Intern Sept 2019 – Apr 2020
- Developed regression models to characterize drift and bias of sensors for integration into ADCS of a satellite.

Temasek Labs (NTU) Singapore
Research Intern (Advised by Holden Li) May 2019 – Feb 2020
- Launched a high-altitude balloon (HAB) in Malaysia, gathering climate data from the near-space region.

Publications

[8] **Learning How Hard to Think: Input-Adaptive Allocation of LM Computation** 2024
Mehul Damani, Idan Shenfeld, Andi Peng, Andreea Bobu, Jacob Andreas
Under review at ICLR

[7] **Open Problems and Fundamental Limitations of Reinforcement Learning from Human Feedback** 2023
Stephen Casper, Xander Davies, Claudia Shi, Thomas Krendl Gilbert, Jérémy Scheurer, Javier Rando, Rachel Freedman, Tomasz Korbak, David Lindner, Pedro Freire, Tony Wang, Samuel Marks, Charbel-Raphaël Segerie, Micah Carroll, Andi Peng, Phillip Christoffersen, **Mehul Damani**, Stewart Slocum, Usman Anwar, Anand Siththaranjan, Max Nadeau, Eric J Michaud, Jacob Pfau, Dmitrii Krasheninnikov, Xin Chen, Lauro Langosco, Peter Hase, Erdem Biyik, Anca Dragan, David Krueger, Dorsa Sadigh, Dylan Hadfield-Menell
Transactions on Machine Learning Research (TMLR)

[6] **Mitigating Generative Agent Social Dilemmas** 2023
Julian Yocum, Phillip Christoffersen, **Mehul Damani**, Justin Svegliato, Dylan Hadfield-Menell, Stuart Russell
NeurIPS 2023 Foundation Models for Decision Making Workshop

[5] **Formal Contracts Mitigate Social Dilemmas in Multi-Agent RL** 2023
Andreas Haupt, Phillip Christoffersen, **Mehul Damani**, Dylan Hadfield-Menell

Autonomous Agents and Multi-Agent Systems

[4] **SocialLight: Distributed Cooperation Learning towards Network-Wide Traffic Signal Control** 2023

Harsh Goel, Yifeng Zhang, **Mehul Damani**, Guillaume Sartoretti

International Conference on Autonomous Agents and Multiagent Systems

[3] **Distributed Reinforcement Learning for Robot Teams: a Review** 2022

Yutong Wang, **Mehul Damani**, Pamela Wang, Yuhong Cao, Guillaume Sartoretti

Current Robotics Reports, Springer

[2] **PRIMAL2: Pathfinding Via Reinforcement and Imitation Multi-Agent Learning - Lifelong** 2021

Mehul Damani, Zhiyao Luo, Emerson Wenzel, Guillaume Sartoretti

IEEE Robotics and Automation Letters

[1] **Flatland Competition 2020: MAPF and MARL for Efficient Train Coordination on a Grid World** 2020

Florian Laurent, Manuel Schneider, Christian Scheller, Jeremy Watson, Jiaoyang Li, Zhe Chen, Yi Zheng, Shao-Hung Chan, Konstantin Makhnev, Oleg Svidchenko, Vladimir Egorov, Dmitry Ivanov, Aleksei Shpilman, Evgenija Spirovska, Oliver Tanevski, Aleksandar Nikov, Ramon Grunder, David Galevski, Jakov Mitrovski, Guillaume Sartoretti, Zhiyao Luo, **Mehul Damani**, Nilabha Bhattacharya, Shivam Agarwal, Adrian Egli, Erik Nygren, Sharada Mohanty

NeurIPS 2020 Competition and Demonstration Track

Projects

Adversarial Vulnerabilities of CLIP Repo

- Generated interpretable, universal perturbations that caused misclassification of images by OpenAI's CLIP model.

MA-Sort Repo

- Developed multi-agent RL benchmark to test emergence of dominance hierarchies in a group of RL agents.

Vigilant Bot Project Page

- Developed RNN-based embedded device for detecting hand gestures and sending automated distress signals.

Vertical Take-off & Landing Aircraft (VTOL) Blog

- Designed, assembled and tested an electric Vertical Take-off and Landing aircraft (VTOL) prototype.

Optimal Debris Deorbiting System Report

- Conceptualized a method to deorbit space debris from low-earth orbit (LEO) using bidirectional ion thrusters.

Skills

Languages: Python, C, MATLAB

Maching Learning: TensorFlow, Torch, HuggingFace, Ray, WandB

Other: Conda, Docker, Git, Linux, Slurm

Honors and Awards

- Vicom Book Prize, *Top Scorer in Thermodynamics out of 500 students* 2019
- Dean's List, *Top 5% of cohort* 2019, 2020
- Kishore Vaigyanik Protsahan Yojana Fellowship, *Awarded by Department of Science and Technology, India* 2017
- National Talent Search Scholar, *Awarded by National Council on Educational Research, India* 2017
- Invited Tedx speaker on Black Holes and Time Travel 2017

Reviewing

- Conference on Neural Information Processing Systems (NeurIPS) 2022, 2024
- International Conference on Learning Representations (ICLR) 2023
- International Conference on Robotics and Automation (ICRA) 2021-2023
- International Conference on Intelligent Robots and Systems (IROS) 2023
- International Conference on Machine Learning (ICML) 2023
- Association for the Advancement of Artificial Intelligence (AAAI) 2022
- Robotics and Automation Letters (RA-L) 2022-2024

Teaching

- Teaching Assistant for 6.8300 (Advances in Computer Vision) 2024
- Peer Tutor for MA2007 (Thermodynamics) 2021
- Organized tutorial on Arduino-powered robotic cars for high-school students. 2020