

ADITYA KAPOOR

Website Email Github LinkedIn Google Scholar

EDUCATION, RELEVANT COURSE WORK & TECHNICAL SKILLS

Birla Institute of Technology and Science Pilani, Goa, India

August 2017 - December 2020

Bachelor in Engineering (B.E.) Hons.

Department of Computer Science and Information Systems.

CGPA: 8.43 / 10.0

Course Work: Neural Networks & Fuzzy Logic, Reinforcement Learning, Comp Neuroscience, Social Psych, Prob Stats, Database Management Systems, OOP, DSA, Information Retrieval

Programming Languages: Python, C++, C

Tools: Docker, L^AT_EX, Git, PyBullet, Gazebo, Coppeliassim, Webots

Coding Exp: I have experience in building ML pipelines for DL and DRL applications in Pytorch.

RESEARCH EXPERIENCE

Biorobotics Lab at Carnegie Mellon University

May, 2020 - Present

Supervisors: **Howie Choset, Benjamin Freed**

- Credit Assignment in Multi-Agent Reinforcement Learning for on-policy Actor Critic methods
- Sample efficient and robust Model-based Reinforcement Learning in Multi-Agent systems.

Aston University, Birmingham, UK || *Robocomp*

April, 2020 - Present

Supervisors: **Luis J Manso, Pilar Bachiller**

- Developing novel Deep Reinforcement Learning enabled Social Navigation Algorithms.

INDUSTRY EXPERIENCE

Tata Consultancy Services, R&I - Predoctoral Research Fellow

October 2021 - Present

- Perception-aware integrated Task and Motion Planning using Neurosymbolic AI for retail shelf and inventory management by detecting and correcting anomalies • *Supervisors:* **Dr. Jayvardhana Gubbi, Dr. Balamuralidhar, Dr. Vighnesh Vatsal**

- Autonomous Composition of Vision Pipeline for Robot Perception • *Supervisors:* **Dr. Jayvardhana Gubbi, Dr. Harshad Khadilkar**

- Multi Agent Reinforcement Learning algorithm for robot task allocation in industrial warehouses. • *Supervisors:* **Dr. Mayank Baranwal**

OPEN SOURCE

Google Summer of Code - Proposal

May - August 2021

Supervisors: **Luis J Manso, Pilar Bachiller**

- Migrating SONATA to Webots & benchmarking social navigation algorithms with SNGNN

Google Summer of Code, Mentor - Idea 14

May - September 2022

Supervisors: **Aditya Kapoor, Luis J Manso**

- Developing low fidelity-simulator for training RL agents that provides realistic social scenes.
- Integrating learned reward function from user-preferences for training RL agents.

SOCIAL VENTURES

CORD.ai - Founding Member

May 2022 - Present

Democratize open-source collaborative research among young professionals & do impactful AI research.

- Administrative work & lead research projects. • LinkedIn • Website

StraysCue - Founder

June 2021 - Present

StraysCue's mission is to help distressed stray animals get medical attention immediately.

Received XartUp Fellowship which is competitive with 8% selection rate. • Website

RELEVANT PROJECTS

- **Project Kratos - Mars Rover** June 2018 - March 2020
- Researched, implemented and integrated a custom RRT* variant for autonomously navigating the Rover.
- 10th rank out of 35 participants in the IRC competition, and the best newly participating rover at the competition. • Website • GitHub • Video Explanation

PUBLICATIONS

Conference

1. Benjamin Freed, **Aditya Kapoor**, Ian Abraham, Jeff Schneider and Howie Choset *Learning Cooperative Multi-Agent Policies with Partial Reward Decoupling* • Accepted at IEEE RA-L'22 ICRA'22 [Link](#)
2. Sujith Thomas, **Aditya Kapoor** and Narayanan Srinivasan. *Effect of a colour-based descriptor and stimuli presentation mode in unsupervised categorization*. In S. Denison., M. Mack, Y. Xu, B.C. Armstrong (Eds.), Proceedings of the 42nd Annual Conference of the Cognitive Science Society (p. 3531). Cognitive Science Society. • [Link](#)

Workshop

1. **Aditya Kapoor**, Nijil George, Vartika Sengar, Vighnesh Vatsal, Jayavardhana Gubbi, Balamuralidhar P and Arpan Pal *Auto-TransRL: Autonomous Composition of Vision Pipelines for Robotic Perception* ICRA Workshop, Robotic Perception and Mapping: Emerging Techniques • [Link](#)
2. Vartika Sengar, **Aditya Kapoor**, Nijil George, Vighnesh Vatsal, Jayavardhana Gubbi, Balamuralidhar P and Arpan Pal *Challenges in Applying Robotics to Retail Store Management* ICRA Workshop, Challenges in Applying Academic Research to Real-World Robotics (Lightning Talk • [Link](#)
3. Rishabh Baghel and **Aditya Kapoor** and Pilar Bachiller and Ronit R. Jorvekar and Daniel Rodriguez-Criado and Luis J. Manso *A Toolkit to Generate Social Navigation Datasets* Accepted for publication in the 21st International Workshop of Physical Agents (WAF2020) • [Link](#)
4. Sujith Thomas, **Aditya Kapoor** and Narayanan Srinivasan. *Supervised category learning: When do participants use a partially diagnostic feature?* Proceedings of the 43rd Annual Conference of the Cognitive Science Society. Cognitive Science Society. • [Link](#)

Preprints

1. **Aditya Kapoor**, Benjamin Freed, Ian Abraham, Jeff Schneider, Howie Choset *Assigning Credit with Partial Reward Decoupling in Multi-Agent Proximal Policy Optimization* Under Review
2. Vartika Sengar, **Aditya Kapoor**, Nijil George, Vighnesh Vatsal, Jayavardhana Gubbi, Balamuralidhar P and Arpan Pal *Anomaly Detection and Automatic Correction using Mobile Manipulators in Retail Stores* Under Review
3. **Aditya Kapoor**, Sushant Swamy, Luis Manso, Pilar Bachiller *SocNavGym: A Reinforcement Learning Gym for Social Navigation* Under Review

Patents

1. ROY CHOUDHURY, Abhishek; VATSAL, Vighnesh; RANGARAJAN, Mahesh; BASA ANITHA, Naveen Kumar; **KAPOOR, Aditya**; GUBBI LAKSHMINARASIMHA, Jayavardhana Rama; SARAVANAN, Aravindhan; SENGAR, Vartika; PURUSHOTHAMAN, Balamuralidhar; PAL, Arpan; GEORGE, NIJIL *METHODS AND SYSTEMS FOR AUTONOMOUS TASK COMPOSITION OF VISION PIPELINES USING AN ALGORITHM SELECTION FRAMEWORK* Patent Pending
2. GUBBI LAKSHMINARASIMHA, Jayavardhana Rama; SENGAR, Vartika; VATSAL, Vighnesh; PURUSHOTHAMAN, Balamuralidhar; PAL, Arpan; GEORGE, NIJIL; **KAPOOR, Aditya** *SYSTEMS AND METHODS FOR ANOMALY DETECTION AND CORRECTION* Patent Pending