

Abhishek Naik

abhishek.naik@ualberta.ca | [abhisheknaik96.github.io](https://github.com/abhisheknaik96)

EDUCATION

- **Ph.D., Computing Science** CGPA: 4.0/4.0, 2018-ongoing
University of Alberta, Edmonton, Canada Supervisor: [Richard S. Sutton](#)
- **Integrated B.Tech.+M.Tech., Computer Science and Engineering** CGPA: 9.49/10, 2013-18
Indian Institute of Technology Madras, Chennai, India Supervisor: [B. Ravindran](#)

RESEARCH

(* equal contribution)

- **Investigating Action-space Generalization in RL for Recommender Systems** [[Paper](#), [Poster](#)]
Abhishek Naik, Bo Chang, Alexandros Karatzoglou, Martin Mladenov, Ed H. Chi, Minmin Chen
Oral presentation at the *Decision Making for RecSys workshop at WWW*, 2023
- **Multi-Step Average-Reward Prediction via Differential TD(λ)** [[Paper](#), [Poster](#)]
Abhishek Naik, Richard S. Sutton
Presented at the *Conference on Reinforcement Learning and Decision Making (RLDM)*, 2022
- **Average-Reward Learning and Planning with Options** [[Paper](#), [Poster](#)]
Yi Wan, Abhishek Naik, Richard S. Sutton
In *Advances in Neural Information Processing Systems (NeurIPS)*, 2021
- **Towards Reinforcement Learning in the Continuing Setting.** [[Paper](#), [Poster](#)]
Abhishek Naik, Zaheer Abbas, Adam White, Richard S. Sutton
Presented at the *Never-Ending Reinforcement Learning (NERL) workshop at ICLR*, 2021
- **Learning and Planning in Average-Reward Markov Decision Processes** [[Paper](#), [Poster](#)]
Yi Wan, Abhishek Naik*, Richard S. Sutton*
In *International Conference on Machine Learning (ICML)*, 2021
- **Discounted Reinforcement Learning Is Not an Optimization Problem** [[Paper](#), [Poster](#)]
Abhishek Naik, Roshan Shariff, Niko Yasui, Hengshuai Yao, Richard S. Sutton
Presented at *The Optimization Foundations of RL workshop at NeurIPS*, 2019
- **MADRaS: Multi Agent DRiving Simulator** [[Paper](#)]
A. Santara, S. Rudra, S.A. Buridi, M. Kaushik, Abhishek Naik, B. Kaul, B. Ravindran
In *Journal of Artificial Intelligence Research (JAIR)*, 2021
- **RAIL: Risk-Averse Imitation Learning** [[Paper](#)]
A. Santara, Abhishek Naik*, B. Ravindran, D. Das, D. Mudigere, S. Avancha, B. Kaul*
In *International Conference on Autonomous Agents and MultiAgent Systems (AAMAS)*, 2018

MASTER'S THESIS

Deep Reinforcement Learning: Reliability and Multi-Agent Environments [[Thesis](#), [Slides](#)]

My goal was to make self-driving cars a reality in my country, India. Towards this end, I modeled it as a multi-agent learning problem in a safety-critical application and:

- proposed a risk-averse imitation learning algorithm that achieved lower tail-end risk compared to the then state-of-the-art,
- trialled a curriculum-based learning approach for multi-agent learning in RoboSoccer, and
- extended the TORCS racing game to release the first open-source driving simulator that supports multi-agent training – MADRaS (has 100+ stars on [Github](#)).

WORK EXPERIENCE

- Research Intern, **Google Research, Brain Team** *June–Sep 2022*
Toronto, Canada Advisors: [Bo Chang](#), [Alexandros Karatzoglou](#)
 Investigated methods for action-space generalization in RL for large-scale recommender systems like YouTube.
- Research Intern, **Huawei Research** *May–Aug 2019*
Edmonton, Canada Advisor: [Hengshuai Yao](#)
 Began investigating the discounted-reward and average-reward formulations for continuing (non-episodic) problems in RL.
- Research Intern, **Intel Labs** *May–Jul 2017*
Bengaluru, India Advisor: [Bharat Kaul](#)
 Started work on a risk-averse imitation learning approach that achieved up to 89% improvement over the then state-of-the-art on standard robotic control tasks.
- Research Intern, **Purdue University**, Dept. of Computer Science *May–Jul 2016*
Indiana, USA Advisor: [Bruno Ribeiro](#)
 Analyzed the expected activity-lifespan of social-media users based on their early profile activity. Curated and released a rich social-media dataset for public use via [a technical paper](#).
- Software Engg. Intern, **Amazon Development Center** *May–Jul 2015*
Chennai, India Advisor: [Sravan Bodapati](#)
 Helped build a classifier to determine the start-reading-location of books.
 Now in production, this feature helps Kindle users start reading a book quicker after downloading it, without having to flip through pages like acknowledgements or copyright notices.

TEACHING EXPERIENCE

- Teaching Assistant, **Reinforcement Learning II** ([CMPUT609](#)) *Jan–Apr 2023, 2021, 2020*
 University of Alberta, Edmonton, Canada Instructor: Richard S. Sutton
- Teaching Assistant, **Reinforcement Learning I** ([CMPUT397](#)) *Sep–Dec 2020*
 University of Alberta, Edmonton, Canada Instructor: Martha White
- Content Developer, **Coursera Reinforcement Learning Specialization** *Jan–Oct 2019*
 University of Alberta, Edmonton, Canada Instructors: Adam White, Martha White
- (Head) Teaching Assistant, **Reinforcement Learning** (CS6700) *Jan–May 2018*
 Indian Institute of Technology Madras, Chennai, India Instructor: B. Ravindran
- Teaching Assistant, **Machine Learning** (CS4011) *Aug–Nov 2017*
 Indian Institute of Technology Madras, Chennai, India Instructors: B. Ravindran, M. Khapra

RELEVANT AWARDS

- **Best Poster Award** runner-up at AICan 2019 poster competition at NeurIPS 2019
- **University of Alberta Graduate Fellowship** for excellent academic performance 2019
- **Star TA Award** for outstanding work as a Teaching Assistant 2018

SELECTED TALKS

- **Essentials of Reinforcement Learning** [Slides]
3rd Nepal Winter School in AI, Virtual Dec 2021
- **Towards Reinforcement Learning in the Continuing Setting** [Slides]
Never-Ending Reinforcement Learning (NERL) workshop at ICLR 2021, Virtual May 2021
- **Personalized Brain State Targeting via Reinforcement Learning** [Video, Slides]
The 3rd Neuromatch Conference, Virtual Oct 2020
- **Learning and Planning in Average-Reward MDPs** [Video, Slides]
Tea Time Talk, Virtual Aug 2020
- **On Intelligence: A Glimpse of the Diversity in Natural Intelligence** [Video, Slides]
Amii AI Meetup, Edmonton, Canada June 2020
- **Figuring Out How the Mind Works** [Video, Slides]
Cognitive Psychology Seminar, Dept. of Psychology, University of Alberta March 2020
- **Discounting – Does It Make Sense?** [Video, Slides]
Tea Time Talk, RLAI lab and Amii, Edmonton, Canada Aug 2019

COMMUNITY SERVICE

- **Reviewer**, *Artificial Intelligence*, ICLR 2020, AAAI 2021, RL4RL at ICML 2021 and NeurIPS 2022
- **Co-organizer**, *ICML 2021 Social* on Continuing (Non-episodic) RL Problems July 2021
- **Co-organizer**, *NeurIPS 2020 Tutorial* on Policy Optimization in RL Dec 2020
- **Organizer**, *Amii Tea Time Talks*, Virtual June - Aug 2020
- **Executive Member**, *Computing Science Graduate Students' Association*, UofA Apr 2019 - Apr 2020
- **Volunteer**, *Centre for Autism Services Alberta*, Edmonton Jan 2019 - Mar 2020
- **Mentor**, *Student Wellness Center*, IIT Madras Aug 2015 - May 2017