# Abhishek Naik

abhishek.naik@ualberta.ca | abhisheknaik96.github.io

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## 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

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## PAPERS
(* equal contribution)

- **Average-Reward Learning and Planning with Options**
  *Yi Wan,* **Abhishek Naik***, Richard S. Sutton*
  To appear 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

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## 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 simulator to release the first open-source driving simulator that supports multi-agent training – MADRaS (has 100+ stars on Github).

## WORK EXPERIENCE

- Research Intern, **Huawei Research** *May – Aug 2019*
  *Edmonton, Canada* Advisor: <u>Hengshuai Yao</u>
  Started investigating the discounted and average-reward formulations for continuing (non-episodic) problems in RL.

- Research Intern, **Intel Labs** *May – Jul 2017*
  *Bengaluru, India* Advisor: <u>Bharat Kaul</u>
  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: <u>Bruno Ribeiro</u>
  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 <u>a technical paper</u>.

- Software Engg. Intern, **Amazon Development Center** *May – Jul 2015*
  *Bengaluru, India* Advisor: <u>Sravan Bodapati</u>
  Built 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** (<u>CMPUT609</u>) *Jan – Apr 2021*
  University of Alberta, Edmonton, Canada Instructor: Richard S. Sutton

- Teaching Assistant, **Reinforcement Learning I** (<u>CMPUT397</u>) *Sep – Dec 2020*
  University of Alberta, Edmonton, Canada Instructor: Martha White

- Teaching Assistant, **Reinforcement Learning II** (CMPUT609) *Jan – Apr 2020*
  University of Alberta, Edmonton, Canada Instructor: Richard S. Sutton

- Content Developer, **<u>Coursera Reinforcement Learning Specialization</u>** *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*

## TALKS

- **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

- **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*
- **Program Committee Member**: *AAAI 2021*
- **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*