

# Deepak Ranganatha Sastry Mamillapalli

Edmonton, Alberta, Canada

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## Education

### University of Alberta

Edmonton, Alberta, Canada

B.SC. IN COMPUTING SCIENCE SPECIALIZATION

Sep. 2019 - Dec. 2023

- Was awarded a University of Alberta Faculty of Science Gold standard scholarship which is given to the top 5% of students in each faculty based on the admission average

## Research Experience

### Intelligent Robot Learning Lab, University of Alberta

Edmonton, Alberta, Canada

REINFORCEMENT LEARNING FOR FPGA PLACEMENT

Jun. 2023 - Present

- Supervisor: Matthew E. Taylor
- Applying Reinforcement Learning to optimize FPGA placements
- Leveraged Convolutional Neural Network and Graph Convolutional Neural Network techniques for effective feature extraction
- Enhanced agent exploration by integrating Random Network Distillation (RND)
- Refined feature representations and conducted rigorous hyperparameter tuning to optimize the network structure

### Intelligent Robot Learning Lab, University of Alberta

Edmonton, Alberta, Canada

UNDERSTANDING AND PREDICTING ENERGY COSTS IN REINFORCEMENT LEARNING

Dec. 2022 - Apr. 2023

- Supervisor: Matthew E. Taylor
- Identified and assessed the impact of features on predictive accuracy of models in predicting energy costs during Reinforcement Learning training and simulation
- Evaluated KNN and Random Forest models for prediction
- Performed extensive hyperparameter tuning to improve accuracy of the models

### Intelligent Robot Learning Lab, University of Alberta

Edmonton, Alberta, Canada

SURVEY OF MULTIPLE MODALITIES OF HUMAN-IN-THE-LOOP REINFORCEMENT LEARNING

Dec. 2022 - Apr. 2023

- Supervisor: Matthew E. Taylor
- Conducted a research study on various modes of human-in-the-loop reinforcement learning
- Programmed a Pytorch-based implementation of the Uncertainty-Aware Action Advising approach for Deep Reinforcement Learning agents
- Contributed a scholarly discussions on the project, presenting insights and ideas for future research and development in Reinforcement Learning Algorithms

## Professional Experience

### University of Alberta Aerial Robotics Group

Edmonton, Alberta, Canada

IMAGING AND AUTOPILOT TEAM MEMBER

Sep. 2022 - Feb. 2023

- Developed an efficient pathfinding algorithm for a fixed-wing drone, ensuring minimal travel distance while effectively avoiding obstacles.
- Enhanced drone safety by aiding in the design of a computer vision model at the ground station to identify favorable landing pads and avoid hazardous ones.

### University of Alberta

Edmonton, Alberta, Canada

TEACHING ASSISTANT

Sep. 2021 - Apr. 2022

- Supported Professor Martha White by assisting in the facilitation of both remote and in-person sessions for "CMPUT 267: Introduction to Machine Learning" class.
- Conducted office hours and review sessions, guiding students through their assignments and exam preparation in the same course.
- Managed grading responsibilities and maintained the organization and accessibility of course resources

## Publications and Preprints

- **Deepak Ranganatha Sastry Mamillapalli**, Omid Hajihassani, Francois Perron, Matthew E. Taylor. September 2023. "Understanding and Predicting Energy Costs in Reinforcement Learning." Currently under submission to the NeurIPS 2023 Workshop: Tackling Climate Change with Machine Learning
- Shang Wang, **Deepak Ranganatha Sastry Mamillapalli**, Qianxi Li, Tianpei Yang, Matthew E. Taylor. September 2023. "Reinforcement Learning for FPGA placement." Currently under submission to the NeurIPS 2023 Workshop: ML For Systems
- Brett Edgar, Dakota Kryzanowski, Henry Lin, **Deepak Ranganatha Sastry Mamillapalli**. December 2022. "Introductory Evaluation of Deep Neural Network and Classification Technique in Identifying the Brain's Representation of Metaphorical Meaning." Preprint.