Deepak Ranganatha Sastry **Mamillapalli**

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Education

University of Alberta *Edmonton, Alberta, Canada*

B.Sc. in Computing Science Specialization *Sep. 2019 - Dec. 2023*

University of Alberta *Edmonton, Alberta, Canada*

M.Sc. in Computing Science *Jan. 2024 - Apr. 2026 (expected)*

Research Experience

Intelligent Robot Learning Lab, University of Alberta & PCL Construction *Edmonton, Alberta, Canada*

Reinforcement Learning for Construction Sequencing *Apr. 2024 - Current*

- Supervisor: Matthew E. Taylor
- Formulated construction task sequencing as a Markov Decision Process for real-world project scheduling
- Developed the simulator to compare RL performance against scheduling baselines
- Developed multi-objective reward function balancing movement of crews, project duration and labour-curve smoothness
- Collaborating with industry partner (PCL Construction) to define constraints and validate modelling assumptions
- Currently working on evaluating RL agent's performance against expert-generated sequences collected from domain experts

Intelligent Robot Learning Lab, University of Alberta *Edmonton, Alberta, Canada*

Reinforcement Learning for FPGA placement *Jun. 2023 - Jan. 2024*

- Supervisor: Matthew E. Taylor
- Applied 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

Alberta Machine Intelligence Institute *Edmonton, Alberta, Canada*

AI Career Accelerator Program *Mar. 2024 - Mar. 2024*

- Helped organize Alberta's first GovTech Hackathon, facilitating the development of machine learning solutions to address public sector challenges
- Supported participating teams by answering questions and providing guidance on implementing ML solutions

Alberta Machine Intelligence Institute *Edmonton, Alberta, Canada*

AI Career Accelerator Program *April. 2024 - May. 2024*

- Contributed to the development of the "AI in Biology and Life Sciences" specialization MOOC on Coursera
- Created video scripts and slide content, collaborating with team members to deliver educational material

Alberta Machine Intelligence Institute *Edmonton, Alberta, Canada*

AI Career Accelerator Program *Sept. 2024 - Dec. 2024*

- Collaborated with AMII scientists to evaluate the feasibility of ML-based approaches for a client project
- Prepared client-facing materials, including slides and a high-level approach, and delivered a comprehensive report outlining the potential ML solutions to address the client company's challenges

Alberta Machine Intelligence Institute *Edmonton, Alberta, Canada*

AI Career Accelerator Program *Aug. 2025 - Nov. 2025*

- Collaborated with AMII scientists to evaluate the feasibility of ML-based approaches for a client project
- Prepared client-facing materials, including slides and a high-level approach, and delivered a comprehensive report outlining the potential ML solutions to address the client company's challenges

Publications and Preprints

- Calarina Muslimani, Bram Grooten, **Deepak Ranganatha Sastry Mamillapalli**, Decebal Constantin Mocanu, Matthew E. Taylor. February 2024. "Robust Preference Learning with Dynamic Sparse Training" Accepted as an extended abstract to International Conference on Autonomous Agents and Multiagent Systems 2025
- Shang Wang, **Deepak Ranganatha Sastry Mamillapalli**, Tianpei Yang, Matthew E. Taylor. February 2024. "FPGA Divide-and-Conquer Placement using Deep Reinforcement Learning" Accepted to the International Symposium of Electronic Design Automation 2024
- Shang Wang, **Deepak Ranganatha Sastry Mamillapalli**, Qianxi Li, Tianpei Yang, Matthew E. Taylor. September 2023. "Reinforcement Learning for FPGA placement." Accepted to the NeurIPS 2023 Workshop: ML For Systems
- **Deepak Ranganatha Sastry Mamillapalli**, Omid Hajihassani, Francois Perron, Matthew E. Taylor. September 2023. "Understanding and Predicting Energy Costs in Reinforcement Learning." Preprint
- 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.