Sahand Rezaei-Shoshtari
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💼 EDUCATION

Sep. 2024 Sep. 2020	PhD, SCHOOL OF COMPUTER SCIENCE, MCGILL UNIVERSITY, Montreal, Canada **Supervisors :** David Meger, Doina Precup **Thesis :** Hierarchical Reinforcement Learning
Dec. 2019 Sep. 2017	Master of Engineering - Thesis, MCGILL UNIVERSITY, Montreal, Canada **Supervisors :** Inna Sharf, David Meger **CGPA :** 4.00/4.00 **Thesis :** Learning Manipulator Dynamics for Control and Interaction Inference
Sep. 2016 Sep. 2012	Bachelor of Mechanical Engineering, UNIVERSITY OF TEHRAN, Tehran, Iran **Supervisor :** Masoud Shariat Panahi **CGPA :** 3.98/4.00 **Thesis :** Online Path Planning for a Mobile Robot in Dynamic Environments using Reinforcement Learning

💼 WORK EXPERIENCE

Present Mar. 2020	Research Intern, SAMSUNG AI CENTRE, Montreal, Canada › Deep reinforcement learning for 5G networks
Mar. 2020 Jan. 2020	AI Programmer, UBISOFT LA FORGE, Montreal, Canada › Deep reinforcement learning for automated video game testing
Aug. 2019 Mar. 2019	Research Intern, SAMSUNG AI CENTRE, Montreal, Canada › Worked on object detection neural networks for human hand-wave motions › Implemented the vision stack on-board of a mobile robot using Google Edge TPU
Apr. 2019 Sep. 2017	Teaching Assistant, MCGILL UNIVERSITY, Montreal, Canada › **Courses :** System Dynamics and Control, Numerical Methods, Machine Element Design

🎓 PUBLICATIONS

2020   Rezaei-Shoshtari, **Sahand** and Meger, David and Sharf, Inna. "Learning the Latent Space of Robot Dynamics for Cutting Interaction Inference". In *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2020.

2019   Rezaei-Shoshtari, **Sahand** and Meger, David and Sharf, Inna. "Cascaded Gaussian Processes for Data-efficient Robot Dynamics Learning". In *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2019.

🎓 CERTIFICATIONS

Aug. 2019   **Deep Learning and Reinforcement Learning Summer School** in Edmonton, Canada

⊞ Skills

Programming	Python, C++, C#, MATLAB, Simulink
Machine Learning Frameworks	PyTorch, TensorFlow, GPyTorch, GPFlow
Platforms	ROS, Docker
Robotic Software	Gazebo, MoveIt!, RViz, OpenCV, Bullet
Other Software	Unity 3D, SolidWorks, LaTeX, Microsoft Project

🖵 Select Projects

Learning the Latent Space of the Dynamics of a Robotic Manipulator using Deep Generative Models — 2019

- › Implemented Variational Autoencoders for learning the latent space of the dynamics of a robotic manipulator
- › Used the latent space to infer the interactions of the robot and draw predictions for its future states
- › Collected a dataset of real robotic cutting interactions and evaluated the framework in the context of robotic cutting

Cascaded Gaussian Processes for Data-efficient Robot Dynamics Learning — 2018-2019

🗗 IROS 2019 Paper   🗗 IROS 2019 Video

- › Developed cascaded Gaussian processes to learn the dynamics of a robotic manipulator in a fashion that respects our knowledge of the underlying topology of the system
- › Evaluated the proposed method for controlling a robotic manipulator using model-based torque controllers
- › Obtained better data and learning efficiency compared to standard methods

Learning Quadrotor Controls Using Data-Efficient Model-based Reinforcement Learning — 2017

🜚 github.com/sahandrez/quad_pilco   🗗 Simulation Videos   🗗 Report

- › Implemented PILCO (Probabilistic Inference for Learning Control) on a quadrotor to learn the control policies under the loss of an actuator
- › Successfully learned to hover with only three actuators

Motion Planning and Control Utilities for Kinova Jaco 2 Robot — 2017-2018

🜚 github.com/sahandrez/jaco_control

- › Worked on the full stack of Kinova Jaco 2 robot
- › Implemented impedance control, feedforward torque control, and velocity control utilities
- › Implemented motion planning utilities for joint space and Cartesian space planning

Design, Fabrication and Control of a Rotary Stewart Platform — 2016

- › Designed and modelled a fully-functional Stewart platform in a team of 4
- › Fabricated the robot with CNC Plastic machining
- › Solved the inverse kinematics and controlled the robot using LabView

🎓 Honors and Awards

Nov. 2019	IROS Student and Developing Countries (SDC) Travel Award ($600), IEEE/RSJ IROS 2019
2017-2018	Grad Excellence Award ($5000) in Mechanical Engineering, McGill University
2015-2016	Faculty of Engineering Award, Ranked 2nd, University of Tehran
2014-2015	Faculty of Engineering Award, Ranked 3rd, University of Tehran
2012-2012	Nationwide University Entrance Exam, Ranked 19th, Iran

💼 Extracurricular Activities

Sep. 2019	Volunteer, 2019 Montreal AI Symposium in Montreal, Canada
May 2019	Volunteer, 2019 IEEE International Conference on Robotics and Automation (ICRA) in Montreal, Canada

❝ References

References available upon request.