

Ossama Ahmed

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Education

ETH Zürich

MSc. Robotics, Systems & Control

Sep. 2018 - Sept. 2020

Zürich, Switzerland

McGill University

BEng. Software Engineering

Sep. 2013 - Dec. 2016

Montreal, QC

Skills

- **Languages and Frameworks:** C++, Python, C, Java, Tensorflow, PyTorch, Mujoco, Bullet and ROS
- **Relevant Coursework:** Advanced Machine Learning, Deep Learning, Machine Perception, Vision for Robotics, Model Predictive Control, Causality, Bayesian Statistics, System Identification, Autonomous Mobile Robots, Linear Systems Theory

Industry Experience

DeepLite.ai

Applied Research Scientist - Consultant

June. 2018 - Sep. 2018

Montreal, QC

- Engineered a neural network optimizer that improves speed, size and efficiency for on-device inference of neural networks.
- Improved the compression rate of neural networks by 15X using reinforcement learning.
- Tools used: Python, Tensorflow and PyTorch

Qualcomm

Machine Learning Software Engineer

June. 2017 - June. 2018

Toronto, ON

- Designed and developed a tool that parses and optimizes Tensorflow graphs for faster runtime of neural networks on Snapdragon mobile devices - using CPU, DSP or GPU.
- Implemented inference algorithms and GPU kernels for the different layers needed to support SOTA perception models.
- Tools used: C++, Python, Tensorflow, Caffe, Caffe2 and CUDA

Research Experience

Montreal Institute for Learning Algorithms (MILA)

Visiting student Researcher - Prof. Yoshua Bengio

Oct. 2020 - Present

Montreal, QC

- Research on motion planning using model-based learning methods.

Max Planck Institute for Intelligent Systems

Visiting student Researcher - Prof. Bernhard Schölkopf

Feb. 2020 - Sept. 2020

Tübingen, Germany

- Developed and released CausalWorld, a novel robotics manipulation library for generalization in reinforcement learning.
- Collaborated with a team of engineers and researchers to launch the Real Robot Challenge - as part of the open dynamic robot initiative - where participants can use a farm of real robot manipulators as a cluster computing service.
- This work was covered by multiple news articles including IEEE Spectrum and Digital Trends.
- Tools used: C++, Python, Tensorflow, ROS and Bullet

Learning and Adaptive Systems Lab, ETH Zurich

Master's student Researcher - Prof. Andreas Krause

Oct. 2019 - Feb. 2020

Zurich, Switzerland

- Implemented and benchmarked a model predictive controller(MPC) that uses a bayesian network to plan under uncertainty.
- Released blackbox mpc library for MPC with sampling-based optimizers to enable fast prototyping of new optimizers.
- Tools used: Python, Tensorflow and Mujoco

Robotic Systems Lab, ETH Zurich

Master's student Researcher - Prof. Marco Hutter

Feb. 2019 - July. 2019

Zurich, Switzerland

- Designed a legged locomotion controller for ANYmal robot that uses imitation learning to imitate different walking gaits.
- Successfully developed a simulated environment of the ANYmal robot using Mujoco physics engine for training controllers.
- Tools used: C++, Python, Tensorflow, ROS and Mujoco

Reliable Silicon Systems Lab, McGill University

Research Assistant - Prof. Brett Meyer

May. 2016 - May. 2017

Montreal, QC

- Leveraged machine learning to develop a neural architecture search engine that design quantized models for FPGAs.
- Tools used: Python, Tensorflow and Theano

Publications and Posters – ([link](#))

- "CausalWorld: A Robotic Manipulation Benchmark for Causal Structure and Transfer Learning" under review at ICLR 2021
- "Neural Networks Designing Neural Networks", Hardware and Algorithms for Learning On-a-chip (HALO) 2016 - Poster

Notable Projects – (full portfolio at [link](#))

- Online Adaptation using Graph Neural Networks in Model-Based Reinforcement Learning
- Deep 3D Human Pose Estimation
- Sparse Monocular Visual Odometry Pipeline
- Local Exploration Based on Truncated Signed Distance Field Map using Reinforcement Learning