# Ossama Ahmed

❖ http://ossamaahmed.github.io/ ❖ http://github.com/ossamaAhmed ❖ ossama.ahmed@mila.quebec

## Education

**ETH Zürich** Sep. 2018 - Sept. 2020
MSc. Robotics, Systems & Control *Zürich, Switzerland*

**McGill University** Sep. 2013 - Dec. 2016
BEng. Software Engineering *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** June. 2018 - Sep. 2018
*Applied Research Scientist - Consultant* *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** June. 2017 - June. 2018
*Machine Learning Software Engineer* *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)** Oct. 2020 - Present
*Visiting student Researcher - Prof. Yoshua Bengio* *Montreal, QC*

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

**Max Planck Institute for Intelligent Systems** Feb. 2020 - Sept. 2020
*Visiting student Researcher - Prof. Bernhard Schölkopf* *Tubingen, 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** Oct. 2019 - Feb. 2020
*Master's student Researcher - Prof. Andreas Krause* *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** Feb. 2019 - July. 2019
*Master's student Researcher - Prof. Marco Hutter* *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** May. 2016 - May. 2017
*Research Assistant - Prof. Brett Meyer* *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