oahmed@student.ethz.ch

Ossama Ahmed

❖ +41 78 921 22 92   ❖ https://www.github.com/ossamaAhmed

Education

ETH Zürich   Sep. 2018-Aug. 2020
Master of Science, Robotics, Systems and Control   *Zürich, Switzerland*
<u>Courses:</u> Autonomous Mobility on Demand, Probabilistic Graphical Models for Image Analysis, Advanced Topics in Machine Learning, Advanced Machine Learning, Computer Vision, Vision for Robotics, Linear Systems Theory, Model Predictive Control, Causality, Machine Perception, Bayesian Statistics, System Identification, Autonomous Mobile Robots.
<u>Tutor:</u> Professor Andreas Krause

McGill University   Sep. 2013-Dec. 2016
Bachelor of Engineering, Software engineering. **GPA: 3.63**   *Montreal, QC*
<u>Courses:</u> Honours Algorithms and Data Structures, Compiler Design, Artificial Intelligence and Digital System Design.
<u>Awards:</u> - Meyer Undergraduate Award   - Gruber SURE Award
          - Member of the Golden Key International Honour Society - Graduated as the class Valedictorian from Riada School

Work Experience

Empirical Inference, Max Planck Institute for Intelligent Systems   Feb. 2020-Aug. 2020
Master's student Researcher   *Tubingen, Germany*
- Research on causal reinforcement learning for a physical multi-finger platform under the supervision of **Stefan Bauer** and **Prof. Bernhard Schölkopf**.

Learning and Adaptive Systems Lab, ETH Zurich   Oct. 2019-Feb. 2020
Master's student Researcher   *Zurich, Switzerland*
- Conducting research on how to use a Bayesian Neural Network which models the dynamics of a system for control through the propagation of state uncertainties in a model based reinforcement learning context under the supervision of **Jonas Rothfuss** and **Prof. Andreas Krause**.

Robotics Systems Lab, ETH Zurich   Feb. 2019-July. 2019
Master's student Researcher   *Zurich, Switzerland*
- Investigated the effect of behavioral cloning (BC) on policy gradient methods to design legged locomotion policies for the quadrupedal robot ANYmal under the supervision of **Vassilios Tsounis** and **Prof. Marco Hutter**.

DeepLite.ai   June. 2018-Sep. 2018
Associate Research Engineer - Consultant (Python)   *Montreal, QC*
- Worked on an AI-Driven optimizer that makes Deep Neural Networks (DNNs) faster, smaller and energy-efficient from cloud to edge-computing.
- Particularly explored various methods to compress DNNs to satisfy computational constraints in an automated way using Deep Reinforcement Learning.

Qualcomm   June. 2017- June. 2018
Machine Learning Software Engineer (Python, C++)   *Toronto, ON*
- Worked on the Snapdragon Neural Processing Engine SDK which is designed to help developers run Neural Network models trained in **Caffe**, **Caffe2** or **Tensorflow** on Snapdragon mobile platforms, whether that is the **CPU**, **GPU** or **DSP**.
- Developed techniques for deep network compression for efficient inference across Snapdragon mobile platforms.

Reliable Silicon Systems Lab, McGill University   May. 2016-May. 2017
Research Assistant (Python, Theano, Keras)   *Montreal, QC*
- Worked on a Neural Network that designs other Neural Networks under the supervision of **Prof. Brett Meyer**.
- Machine Learning is leveraged by training an artificial neural network to predict the performance of future candidate networks.

McGill University   Jan. 2016-Apr. 2016
Undergraduate Teaching Assistant   *Montreal, QC*
- Effectively conducted tutorials to over **80 students** in Introduction to Software Engineering Course with **96% satisfaction** on anonymous surveys. Actively mentored students for their projects and grading their assignments.

McGill Robotics   Oct. 2014-Mar. 2015
Autonomy Team member (Python, ROS)   *Montreal, QC*
- Built an autonomous robot that guides itself through an obstacle course as part of the ROBOSUB competition with a team of **70 engineering students** from different backgrounds.

Posters

- S. C. Smithson, **Ossama S. Ahmed**, G. Yang, W. J. Gross, and B. H. Meyer, "Neural Networks Designing Neural Networks", Hardware and Algorithms for Learning On-a-chip (HALO) 2016, Workshop on, Nov 2016. (Poster)

Technical Skills and Hackathons

- **Proficient**: C, Java and Python.
- **Have used**: C++, Java Script, NodeJs, AngularJs, Git, OCaml, HTML, Bash, Perl, CGI, SQL and UNIX environment.
- **Hackathons**: Princeton Hacks (2014), YHacks (2015), Hack the North (2014), McHacks (2014), McGill Code Jam (2015).

Undergraduate Engineering Capstone Project

- **Title**: Telepresence System
- **Supervisor**: **Prof. James Clark**
- **Description**: Successfully developed a Telepresence System that is equipped with high definition cameras remotely connected to an Oculus Rift. The purpose of the Telepresence System is to allow the users to see as if they were physically in place of the system itself. The project focused on three main areas: distortion removal, panoramic frame stitching and high definition video streaming.

Notable Projects

Online Adaptation using Graph Networks in Model-Based RL (Python, Tensorflow)   Fall 2019

Considered learning online adaptation in a model-based reinforcement learning context where we train a dynamics model, implemented as a Graph Neural Network, in conjugation with using MPC to control a system where the controller adapts to changes in the environment or tasks.

Deep 3D Human Pose Estimation (Python, Tensorflow)   Spring 2019

Proposed a pipeline that comprises one of the most recent approaches, namely the HighResolution Network combined with a low-weight baseline model for extracting the 3D skeleton of human subjects applied to the Human3.6M dataset; splitting the challenge to image-related and geometric-related tasks.

Local Exploration Based on TSDF Map using Reinforcement Learning(Python, PyTorch)   Spring 2019

Most current exploration algorithms are based on heuristics and sampling/evaluating many potential viewpoints. The goal of this work is to learn an ideal motion to maximize the known space based on a local map representation.

Monocular Visual Odometry Pipeline (Matlab)   Fall 2018

Successfully implemented a monocular visual odometry (VO) pipeline with the most essential features: initialization of 3D landmarks, key point tracking between two frames, pose estimation using established 2D ↔ 3D correspondences, and triangulation of new landmarks. video

Planning Under Uncertainty (Python, ROS)   Fall 2018

Successfully implemented a path planner and a velocity profiler for a duckiebot as part of **duckietown,** a robotics outreach and educational platform, while taking into account various sources of uncertainty.

GoLite Compiler (OCaml, Java Byte Code)   Winter 2016

Designed a compiler for GoLite, a subset of the Go programming language. Built the entire compiler pipeline (parser, syntax tree, type checker, code generator and optimizer), producing Java Byte Code as the target language.

HUS AI agent (Java, Python)   Winter 2016

Created an Artificial Intelligence agent to compete against more than 200 engineering students to play the HUS game, which is from the family of "Mancala Games", using Reinforcement Learning Techniques. **The agent ranked from the top 10%.**

Enigma Machine (VHDL, ModelSIM)   Winter 2016

Designed, built and tested a model of a digital Enigma Machine, a cipher machine used in WWII, on an FPGA board.

Catch the Flag Robot (Java, Lejos API)   Fall 2015

Led my team in developing an autonomous robot, in a team of 5 students, to compete against more than **120 engineering students** to play catch the flag game, where we **ranked 3/25**.

Loop (NodeJs, FireBase, IOS) - HarvardHacks   Fall 2015

Developed an app where you can type in what news to follow and it updates the news feed by the news in real time using NLP.

SteamRankings (Java, HTML, JavaScript)   Winter 2015

Developed a statistics aggregator, in a team of 6 students, for Steam player data through using Steam Web API.

Bomberman Game (Java)   Fall 2014

Implemented a modified version of this game with integrated account management system.