Yuchen Wu

+1-519-694-7627 cheney.wu@mail.utoronto.ca github.com/cheneyuwu

EDUCATION

B.A.Sc. in Engineering Science (Robotics), University of Toronto **September 2015 – Present**

- 4th Year + PEY **CGPA: 3.93/4.0**
- **GRE General Test** **Total: 332+3.5 (Verbal: 162/170 Math: 170/170 Writing: 3.5/6)**

TECHNICAL SKILLS

- **Programming Languages**: C/C++ (OpenCL & SYCL), Python, Java, Verilog
- **Machine Learning Tools**: PyTorch, TensorFlow
- **Robotics Tools**: MATLAB, ROS, MuJoCo, OpenCV
- **Compiler Related:** LLVM Compiler Infrastructure, High Level Synthesis

RESEARCH EXPERIENCES

Undergraduate Thesis, Prof. Jonathan Kelly & Prof. Florian Shkurti, U of T **September 2019 – Present**

- Addressing multi-stage, long-horizon manipulation problems through subtask primitives and task sketches through hierarchical reinforcement learning and imitation learning.
- Aiming to develop hierarchical learning algorithms that properly identify subtasks given a high-level task and connect subtask primitives.

Research Assistant, Prof. Florian Shkurti, Dept. of Computer Science, U of T **May 2019 – September 2019**

- Addressed sample efficiency problem of reinforcement learning leveraging expert demonstrations.
- Proposed a method to incorporate demonstrations in the form of reward shaping potential that biases the exploration towards states visited by the demonstrator and corresponding actions. The learned policy is optimal w.r.t. the RL objective regardless of the optimality of demonstration data.
- Demonstrated practicality of this method both in simulation and on a Franka Emika 7DOF arm.
- Paper: *Shaping Rewards for Combined Reinforcement and Imitation Learning using Generative Models*. Submitted to *IEEE International Conference on Robotics and Automation (ICRA)*, 1st author.

Research Assistant, Prof. Jianwen Zhu, Dept. of ECE, U of T **May 2017 - September 2017**

- Worked on accelerating the training and inference of deep CNN on systems with multi-core CPUs.
- Investigated popular light-weight deep learning frameworks (tiny-dnn, Caffe2) and existing implementations of fast convolution algorithms (Fast Fourier Transform, Winograd Transform).

Research Assistant, Prof. Shailendra Joshi, Dept. of Mechanical Engineering, NUS **May 2016 - July 2016**

- Worked on computational modeling and analysis of Nano and Micro lattice structure using ABAQUS.

WORK EXPERIENCES

Software Engineer Intern, Intel Corporation **May 2018 – May 2019**

- Involved in Intel HLS Compiler development, a high-level synthesis (HLS) tool that takes in untimed C++ code and generates production-quality register transfer level (RTL) code optimized for Intel FPGAs.
- Involved in Intel FPGA SDK for OpenCL development, a development environment that enables software developers to accelerate applications by targeting heterogeneous platforms with Intel CPUs and FPGAs.

DESIGN PROJECTS

RoboSoccer, University of Toronto Robotics Association (UTRA) **September 2017 – September 2018**

- Involved in design of a humanoid robot to compete in RoboCup 2019.
- Involved in development of a software program playing soccer in a 2D simulated soccer stadium via multi-agent reinforcement learning.

LEGO Midstorms EV3 Kit Robot Design **September 2018 - December 2018**

- Built and programmed in Java: (1) robotics arm for fetching objects; (2) line following robots; (3) Robot navigation in a maze; (4) Obstacle avoidance using A* algorithm.

Autonomous Can-Sorting Robot Design, U of T **January 2017 - April 2017**

- Embedded system design on Microchip PIC18 microcontroller for food-cans' sorting process.
- Involved with programming (in C), circuit implementation and integration.
- The robot is able to sort 12 cans of 4 different types within 1 minute.

HONORS AND AWARDS

University of Toronto Excellence Awards (UTEA), U of T **2019**

Dean's Honors List, U of T **2015 – 2018**

University of Toronto In-Course Scholarships, U of T **2018**

The Garnet W. Mckee - Lachlan Gilchrist Scholarship, U of T **2017**

COMMUNITY INVOLVEMENT

Academic Lead, University of Toronto Machine Learning Student Team (UTMIST) **September 2018 – May 2019**

- Organized MIST101, an introductory workshop series of various machine learning topics that aimed to attract more people to join the field of machine learning.