

Melissa Farinaz Mozifian

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SUMMARY Research assistant at Mobile Robotics Lab & Reasoning and Learning Lab at McGill University supervised by Prof. David Meger and Prof. Joelle Pineau.

EDUCATION MASc Mechanical and Mechatronics Engineering May 2016 - May 2018
University of Waterloo Waterloo, Canada

Core Modules: Statistical Learning, Autonomous Mobile Robots, Deep Learning Reading Course. Research Focus: Computer vision and machine learning for robotics and autonomous vehicles

B.Sc. (Honours) Computer Science September 2010 – June 2014
University of St Andrews St Andrews, UK

First Class Honours Degree.

Core Modules: Data Encoding, Software Engineering, Operating Systems, Artificial Intelligence, Component Technology, Computational Complexity, Multimedia, Human Computer Interaction, Logic & Software Verification, Constraint Programming, Distributed Systems and Computer Graphics.

EXPERIENCE **Research Assistant** August 2018 – Present
McGill University Montreal, Canada

I work on reinforcement learning (RL), especially related to transfer learning, imitation learning and hierarchical RL.

Teaching Assistant September 2017 – Dec 2017
University of Waterloo Waterloo, Canada

Worked as a teaching assistant for the *Autonomous Mobile Robots* course, covering topics on robot motion planning, localization and mapping, and path planning using ROS.

Teaching Assistant January 2017 – May 2017
University of Waterloo Waterloo, Canada

Worked as a teaching assistant for the *Programming for Performance* course.

Graduate Software Engineer October 2014 – April 2016
Toshiba Medical Visualization Systems Ltd Edinburgh, UK

Worked as an application developer delivering medical software. My role involved developing framework features and providing API and framework support. My main project involved integrating 3D visualization software for medical image processing, segmentation and mesh generation. I also worked as part of the Image Analysis team developing image analysis algorithms. My project involved developing algorithms for diagnostic ultrasound and CT-scan imaging applications.

Software Engineer Intern June 2014 – August 2014
Toshiba Medical Visualization Systems Ltd Edinburgh, UK

Worked as part of the Image Analysis team, developing strategies for detecting malfunctions in Toshiba CT scanner hardware by applying software algorithms that analyze abnormalities in sensor data.

Computer Science Lab Demonstrator February 2014 – April 2014
School of Computer Science, University of St Andrews St Andrews, UK

Worked as a lab demonstrator for a program called “Code First Girls”, teaching coding to non-computer science female students with the goal to attract more women in tech.

Research Engineering Intern May 2013 – August 2013
Adobe Systems, Inc Edinburgh, UK

Developed a plug-in prototype to evaluate the feasibility of extending Adobe Photoshop to support online collaborative photo editing using Adobe Creative Cloud.

Research Assistant May 2012 – July 2012
School of Computer Science, University of St Andrews St Andrews, UK

Research Title: Secure SQL Queries Using Dependent Types
Worked with Dr. Edwin Brady to develop a database library for an experimental programming language called Idris. Idris is a general purpose, purely functional language similar to Haskell. I was responsible for implementing an SQLite bridge for Idris to withstand SQL injection attacks.

AWARDS

Academic Prizes & Recognition

- University of Waterloo Graduate Research Studentship (GRS)
- University of Waterloo International Masters Student Award
- Dean’s List, University of St Andrews
- Rector’s Fund Scholarship Recipient - Was awarded the Scholarship offering a grant to establish a useful resource for students taking up internships.
- BCSWomen Lovelace Colloquium Finalist - Was awarded a travel grant to attend and present my bachelor’s thesis project as a poster. This annual event is organized by the British Computer Society (BCS) and sponsored by Google and academic institutions.

Technical Interests Deep Learning, Object Detection, Cognitive Robotics, Autonomous Systems, Artificial Intelligence, Machine Learning, Human Robotics Interaction, Affective Computing

Programming Languages Python, C++, Java ,C, Matlab

Programming Libraries Tensorflow, OpenCV, ROS, Keras, VTK, OpenGL, iOS, NumPy, SciPy, Matplotlib, Scikit-learn

Academic And Personal Projects Real-time 3D Object Detection for Autonomous Driving May 2017 - May 2018
Developed a fast and accurate 3D Object Detector for autonomous driving. This work was deployed on an autonomous vehicle, Autonomoose, integrated using ROS.

Quadrotor Dynamic Modelling using LSTMs March 2017 - Sep 2017
Applied a deep recurrent neural network architecture to model quadrotor dynamics.

- Neural Network based EKF Localization Feb 2017 - Apr 2017
 Object-based localization method with neural networks using YOLO (real-time object detector) to localize objects in the camera frame. Using these detected objects as features, an Extended Kalman Filter was used to estimate the robot pose.
- Pulse Detector iOS app September 2015
 Worked on an emotion detection iOS app. The existing alpha version performs an automated and non-contact pulse detection.
- Affective Mirror (BSc Dissertation) 2013 - 2014
 Developed a program to detect basic human emotions such as happiness, sadness, surprise and excitement from a subject's facial expression and physiological measure of pulse.
- Junior Honors (Group) Project 2012 - 2013
 Developed a virtual representation of St Andrews using the OpenSimulator software, with the aid of maps, terrain data and photographs. The virtual representation was augmented with real-world information and artificial intelligence such as path planning.

Academic Achievements

Theses

1. **Mozifian M (2018): "Real-time 3D Object Detection for Autonomous Driving"**, Master Thesis, University of Waterloo
2. **Mozifian M (2014): "Affective Mirror: Automated Emotion Detection Through Photoplethysmography & Facial Expression Analysis."**, Undergraduate Thesis, University of St Andrews

Publications & Posters

1. Joint 3D Proposal Generation and Object Detection from View Aggregation (IROS 2018). Code
2. Deep Learning a Quadrotor Dynamic Model for Multi-Step Prediction (ICRA 2018).
3. Affective Mirror: Automated Emotion Detection Through Photoplethysmography & Facial Expression Analysis, BCSWomen Lovelace Colloquium, Aberystwyth University, UK

Project Repository

Github, Website