AVISHEK BOSE

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EDUCATION

University of Toronto *September 2017 - Present*
M.aSc Department of Electrical and Computer Engineering *Supervisor: Prof. Parham Aarabi*
University of Toronto *September 2012 - April 2017*
B.aSc Department of Electrical and Computer Engineering
Minor in Mechatronics
Certificate in Engineering Business

TECHNICAL STRENGTHS

Computer Languages	C/C++, Python, MATLAB
Software & Tools	Tensorflow, Pytorch, Keras, Caffe, Unix, LaTeX, Vuforia AR, AWS

EXPERIENCE

Borealis AI May 2017 - Present
Research Intern

· Created a novel technique called Adversarial Contrastive Estimation that improves over conventional Contrastive Learning Frameworks by using an Adaptive Conditional Negative Sampling distribution modeled by a conditional generator in a GAN framework
· Improved the performance of word embeddings for Rare Words using ACE framework

University of Toronto Sept 2017 - Present
Co-Head TA and Co-Lecturer

· Created and delivered Lectures and Tutorials for ECE302: Probability and Applications aimed at 3rd/4th year ECE students
· Responsible for creating and marking of quizzes and assignments

Architech May 2015 - Aug 2016
Junior Machine Learning Engineer

· Developer at the Research and Innovation Lab, created innovative software using state of the art techniques in Computer Vision, Machine Learning and Deep Learning
· Created a novel Eye Gaze Tracking algorithm using input video inputs from webcam's
· Applied Topic Modeling techniques to twitter to discover new emergent sentiments on news stories before they became viral

University of Toronto May 2014 - Aug 2014
Research Assistant

· Created demo's of Veillance Flux and Augmented Reality with the help of Prof. Steve Mann. Hardware technologies used include Meta Space Glasses, Microsoft Kinect, and Depth Sense camera's.
· Co-author in a paper published to IEEE GEM 2014 conference

ACADEMIC ACHIEVEMENTS

Gordon Slemon Design Award Oct 2018

· The Gordon Slemon Design Award is awarded for excellence in engineering design. The criteria set out by the department include effective planning, scheduling, reporting, and excellence in design, execution, creativity, etc. The award is in the form of a $1000 cash prize along with an engraved plaque of all team members.

Centennial Thesis Award May 2017

· This award is offered to the fourth year student that receives the highest grade in the 4th year Design Project. One award is given for each program: electrical and computer engineering programs. Each award is in the form of a $500 prize and an accompanying certificate.

Certificates of Recognition April 2017

· Outstanding projects recognized by certificates handed out to team members at the end of term. Selection is made by the administrators after the 4th year design fair.

Dean's List April 2015,2017

· Awarded for academic performance for having an average higher than 80%

RELEVANT COURSES

Core Courses

Algorithms and Data Structures
Dynamic Systems and Control
Machine Learning
Probability and Applications
Introduction to Non-Linear Control Systems (ongoing)
Computer Networks I
Inference Algorithms
Operating System
Robot Modeling and Control
Topics in Machine Learning:
Scalable and Flexible Models of Uncertainty

PROVISIONAL PATENTS

Adversarial Contrastive Estimation Nov 2017

· Based on the work done at Borealis AI for the creating of a novel learning framework which helps improve rare word embedding quality.

Depth Variable Augmented Reality Interface Jun 2017

· This Provisional Patent is based on the novel system that was developed for my Capstone project and involves combining Machine Learning Algorithms for Face and Hand Gesture tracking, Physical implementation of Control Systems and Mechanical Engineering to create new Augmented Reality experiences that adapt to the user based on distance to the interface.

GENERAL RESEARCH INTERESTS

Currently I'm interested in application of Generative Adversarial Nets (GAN) to Computer Vision and Natural Language Processing problems. Specifically, creating adversarial examples against computer vision models through the use of GAN's and adversarial training to improve quality of learned representations such as word embeddings. Furthermore, my long term research interests lie in solving Artificial General Intelligence, Robotics and answering fundamental questions involving the nature of knowledge, intrinsic motivation, and computational curiosity.