

Bryan M. Li

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Education

University of Edinburgh

Edinburgh, Scotland

CENTRE OF DOCTORAL TRAINING IN BIOMEDICAL ARTIFICIAL INTELLIGENCE

Sep. 2020 - Present

- Supervise by Dr. Arno Onken and Dr. Ian Simpson.
- 4-years studentship funded by the UK Research and Innovation.

University of Edinburgh

Edinburgh, Scotland

MASTERS BY RESEARCH AT THE INSTITUTE FOR ADAPTIVE AND NEURAL COMPUTATION

Oct. 2019 - Aug. 2020

- Supervised by Dr. Arno Onken.
- Worked on synthesising realistic neuronal population activities using deep generative models.

University of Toronto

Toronto, Canada

HONOURS BACHELOR OF SCIENCE WITH DISTINCTION IN COMPUTER SCIENCE

Sep. 2013 - Jun. 2018

- Supervised by Professor Steve Engels and Professor Paul Gries.

Experience

University of Edinburgh

Edinburgh, Scotland

TEACHING ASSISTANT

Feb. 2020 - Aug. 2020

- Supervise 3 MSc students for their MSc thesis project.

Noah's Ark Lab at Huawei Technologies

Toronto, Canada

MACHINE LEARNING RESEARCH ENGINEER

Aug. 2018 - Aug. 2019

- Research on both theory and application of deep learning in HCI and Computer Vision tasks.
- Worked on an anomaly detection project, experimented with various data balancing and generation techniques, such as BAGAN, to overcome imbalanced dataset; Developed an autoencoder model and it is currently being tested for quality assurance. We plan to patent the technology in due course.
- Implemented various SSD models for a hand-over-face interaction project, paper submitted to MobileHCI 2019.
- 5th place at the 2019 Ubicomp emteq Activity Recognition Challenge, implemented BiLSTM model and applied the Madgwick-AHRS algorithm to augment 9 dimensional sensor data to 12 dimensional to enhance classification accuracy.

FOR.ai

Toronto, Canada

MACHINE LEARNING RESEARCHER

Jun. 2017 - PRESENT

- Lead a group of students and new researchers across the world to conduct research in deep learning and reinforcement learning.
- Currently leading the effort to build a modular and cross-platform (CPU, GPU and TPU training) codebase for reinforcement learning research, implemented common algorithms like DQN, policy gradient, PPO etc.
- Worked on research topics relating to adaptive computation time, adversarial examples and pruning.
- Selected by AI Grant as 2018 fellows and awarded \$50,000 worth of research resources funding. [UofT News]

University of Toronto

Toronto, Canada

RESEARCH STUDENT

Sep. 2017 - Aug. 2018

- Under the supervision of Professors Steve Engels and Paul Gries, led a team of 5 to create Virtual Classroom.
- Utilized low cost 360 cameras and virtual-reality headset to create virtual classroom and meeting room. [source code]
- Created a web application with MeteorJS, A-Frame (WebVR) and WebRTC to live stream lectures and group meetings 3D space.
- Our work was selected to present at Immersed 2018 Conference organized by The International Future Computing Association.

University of Toronto

Toronto, Canada

TEACHING ASSISTANT

Sep. 2017 - Apr. 2018

- Teaching Assistant in course CSC258H1 Computer Organization.
- Teaching Assistant in course CSC120H1 Computer Science for the Sciences.
- Mainly responsible for hosting lab/tutorial sessions and marking.

AMD

Markham, Canada

EMBEDDED SOFTWARE ENGINEER PEY

May 2016 - Aug. 2017

- Implemented hardware decoder using VDPAAU to offload and accelerate Virtual Desktop sessions to the GPU for Citrix Receiver on Linux; the project helped AMD Embedded secure more Thin Client customer design wins. [product page]
- Applied a FCNN to detect anomalies in MRI data using ROCm and Caffe (OpenCL) to showcase AMD technology in machine learning and medical imaging. [Demo]

Publication

- 2020 [CalciumGAN: A Generative Adversarial Network Model for Synthesising Realistic Calcium Imaging Data of Neuronal Populations](#) [PDF](#)
Bryan M. Li, Theoklitos Amvrosiadis, Nathalie Rochefort, Arno Onken
Preprint
- 2020 [Improving Predictions in Cloud Data center Workloads using Neural Networks and Online Learning](#)
Jonathon Wong*, Anthony Kwan*, **Bryan M. Li***, Vinod Muthusamy, Hans-Arno Jacobsen
Preprint
- 2019 [RL: A generic reinforcement learning codebase in TensorFlow](#) [PDF](#)
Bryan M. Li, Alexander Cowen-Rivers, Piotr Kozakowski, David Tao, Siddhartha Rao Kamalakara, Nitarshan Rajkumar, Hariharan Sezhiyan, Sicong Huang, Aidan N. Gomez
Journal of Open Source Software
- 2018 [CipherGAN: Unsupervised Cipher Cracking Using Neural Networks](#) [PDF](#)
Aidan N. Gomez, Sicong Huang, Ivan Zhang, **Bryan M. Li**, Muhammad Osama, Łukasz Kaiser
International Conference on Learning Representations
- 2017 [Unsupervised Cipher Cracking Using Discrete GANs](#) [PDF](#)
Aidan N. Gomez, Sicong Huang, Ivan Zhang, **Bryan M. Li**, Muhammad Osama, Łukasz Kaiser
Neural Information Processing Systems DISCML workshop

* - denote equal contribution

Project

A Transformer Chatbot Tutorial with TensorFlow 2.0 [blog][GitHub]

Toronto, Canada

TENSORFLOW

May 2019

- Published a tutorial on TensorFlow's blog on how to build a Transformer chatbot in TensorFlow 2.0.
- Demonstrated the changes in TensorFlow 2.0 and how to use Functional API and model Subclassing to construct complex neural network models.

Reinforcement Learning codebase [GitHub]

Toronto, Canada

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Nov. 2018 - Present

- Leading a team of researchers and students to build a research codebase for reinforcement learning that focuses on modularity, reproducibility, pre-implementing popular RL algorithms, speed and ease of running on different hardware (CPU, GPU and TPU).
- Integrated popular environments such as Gym and Procgen, and agent performance visualization with TensorBoard.
- The codebase has been published in the Journal of Open Source Software (JOSS) in October 2019.

Improve adversarial robustness by enforcing the Lipschitz condition

Toronto, Canada

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Aug. 2018 - Present

- Working on a different approach to enforce k -Lipschitz continuity for a particular k by scaling the weight at each layer to reduce the model's sensitivity to small perturbation.
- Scaling up experiments to consider models closer to state-of-the-art.

Adaptive Computation Time for RNN [GitHub]

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Jan. 2018 - Jun. 2018

- Proposed an alternative ponder cost function to the paper Adaptive Computation Time for RNNs by Alex Graves.
- Implemented the ponder cost function as a function of the cross entropy instead of a learned ponder cost, which itself requires more processing steps.
- The proposed new ponder cost achieved higher accuracy and converged faster than the old ponder cost and transitional RNN in parity task, though performed similarly in sort and addition tasks.