Mohan **Zhang**

University of Toronto · St. George Campus

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Education

Master of Science in Applied Computing, University of Toronto

Toronto

Fall 2019 - Present

Areas of study: Computer Graphics, Computational Linguistics

Honours Bachelor of Science, University of Toronto

Toronto

Computer Science Specialist, Artificial Intelligence focus; Mathematics Major — *Fall 2015 - Spring 2019*

Natural Language Processing, Computer Vision, Probabilistic Learning, Variational Inferences and Sampling, Deep Learning, Searching Problems, Knowledge Representation and Reasoning, Autoepistemic Logic, Constraint Optimization Problems, Computational Complexity and Computability.
Analysis on Manifolds, Topology, Group, Ring and Fields, Complex Variables, Graph Theory, Number Theory and Combinatorics, Differential Equations.

Teaching

CSC2547H1S

UofT, CS department

Seminar in Machine Learning for Machine Vision as Inverse Graphics — *Jan. 2020 - Apr. 2020*

- This is an advanced graduate course in machine learning. It is primarily a seminar course in which students will read and present papers from the literature. The goal is to bring students to the state of the art in this exciting field. Tentative topics include generative and discriminative models for vision, convolutional and deconvolutional neural nets, variational inference and autoencoders, capsule networks, group symmetries and equivariance, visual attention mechanisms, differentiable renderers, and applications.

CSC321H5S

UofT, CS department

Intro to Neural Networks and Machine Learning — *Jan. 2020 - Apr. 2020*

- This course gives an overview of both the foundational ideas and the recent advances in neural net algorithms.

CSC411H5F

UofT, CS department

Machine Learning and Data Mining — *Sep. 2019 - Dec. 2019*

- CSC411 serves as a broad introduction to Machine Learning. It covers a range of supervised and unsupervised learning algorithms. The topics include linear models, non-parametric models, neural networks, ensemble methods, and reinforcement learning.

CSC108H1F

UofT, CS department

Introduction to Computer Programming — *Sep. 2019 - Dec. 2019*

- Introduction to Python.

Experience

Guanghua-Rotman Centre for Information and Capital Market Research

Toronto

Research Associate — *Sep. 2019 - Present*

- Researching on market analysis and companies' credibility check with neural NLP models.

Exxon Mobil

Calgary

Machine Learning Developer Intern (Full Time) — *Sep. 2018 - May 2019*

- Reproduced latest publicized papers in Natural Language Processing to present proof of concept solutions to potential business problems. This involved rebuilding models in PyTorch or Tensorflow according to the architecture specified in papers, Retrained open source models and customized these models for business problems.
  The job also included meeting with different vendors to decide whether they are capable of providing machine learning and AI solutions to business problems encountered by other departments of Exxon Mobil.

Oracle R&D

Toronto

Software Developer Intern (Full Time) — *May 2018 - August 2018*

- Developed new functionalities with the agile approach for Oracle Eloqua; Helped to manage large quantity of data in a distributed system. Also developed Backend functionalities with C# and various kinds of database systems, as well as QA automation.

University of Toronto, Rotman School of Management

Toronto

Research Assistant (Part Time) — *Jan. 2018 - Jul. 2019*

- Used Various NLP and Deep learning methods to analyze the relationship between millions of news articles and the credibility of listed companies.
- Under the supervision of professor Hai Lu.

Publication

PtEQA: Domain Specific Question Answering with Document Extraction Utilizing Pre-trainedWeights

Mohan Zhang, *Sudeep Singh and Pawel Maciszewski*

At Exxon Mobil

- *https://github.com/Mohan-Zhang-u/MyQA*
- This paper demonstrated a methodology to build a question and answering system based on unlabeled large corpus. The model has two components: Document Retriever and Answer Extractor. Document Retriever used bigram hashing and TF-IDF matching to pick the most relevant articles regarding the question; Answer Extractor used the Deep Bidirectional Transformers introduced by *Google AI Language* to locate the answer from relevant articles extracted by Document Retriever.
- Training or fine-tuning is not required for this machine reading system, though it can help improve Q&A performance on domain-specific questions.

Latent Dirichlet Allocation with Residual Convolutional Neural Network Applied in Evaluating Credibility of Chinese Listed Companies

Mohan Zhang, *Zhichao Luo and Hai Lu*

At University of Toronto

- *https://arxiv.org/abs/1811.11017*
- This paper demonstrated a methodology to evaluate Chinese Listed Companies' credibility according to more than two hundred thousand news reports. To solve the word segmentation problem for Chinese, we used Latent Dirichlet Allocation for preprocessing. The scoring system then based on a Residual Convolutional Neural Network.

Projects

Natural Language Processing Demos: *Individual*

Azure, Tensorflow, PyTorch, pyrouge, Apache Server, mod_wsgi, Flask, jQuery

- Text Summarization
- Domain Specific Question and Answering
- Linguistic Acceptability
- Sentiment Analysis
- Semantic Similarity
- Textual Entailment

Other Machine Learning & Probabilistic Learning Projects: *Individual*

Python, Numpy, Scikit-Learn, panda, matplotlib

- **Attention-Based Neural Machine Translation (course work)**
- **Cycle-GAN and DCGAN that converting between Apple-style emoji and Windows-style emoji (course work)**
- **Given a half of the Handwritten Digit, predict the other half (course work)**

Unity 3D games *Individual*

C#, 3DS MAX 2017, Photoshop CC, CorelDRAW, Logic Pro X, Sibelius

- **CartTank**
- **hungryball**

Website *Mohan Zhang, Daewoo Kang*

Javascript, Node.js, MongoDB, jQuery, Ajax

- **TUTO**

Technical Skills

Frameworks:

Python (2 and 3) with ML packages	★★★★★★	PostgreSQL	★★★★★
C# (.Net framework or Unity3D)	★★★★★	MongoDB	★★★★★
LaTeX	★★★★★	SQLite, MySQL	★★★★★
Java	★★★★★	JSON, XML	★★★★★
C++	★★★★★	Bash Script	★★★★★
C	★★★★★	JavaScript, including Node.js and JQuery	★★★★★
MATLAB	★★★★★	Prolog/GOLOG	★★★★★

Operating Systems/Platforms:

Linux(Ubuntu, Debian)	★★★★★	MacOS	★★★★★
Windows	★★★★★	Cloud VMs (Azure, GCP)	★★★★★

Version Controls:

Git	★★★★★	SVN	★★★★★