

# TIANSHU SHEN

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## EDUCATION

### University of Toronto

*Master of Applied Science in Industrial Engineering (Research-based), CGPA: 4.0/4.0* Sep 2020 – Present

- Supervisor: Prof. Scott Sanner
- Research Field: Conversational Recommendation, Natural Language Processing

*Bachelor of Applied Science in Industrial Engineering with Honours, CGPA: 3.78/4.0* Sep 2015 – Jun 2020

## PAPERS

### Bayesian Critiquing with Keyphrase Activation Vectors for VAE-based Recommender Systems.

Yang, H.; **Shen, T.**; and Sanner, S.

*In Proceedings of the 44th International ACM SIGIR, Online, 2021.*

*Keywords: Deep Generative Model; Probabilistic Inference; Active Learning; Interactive Recommendation*

## ENGINEERING PROJECTS

### *Machine Learning Course Project: Neural Network for Recommender Systems* Sep 2020 – Dec 2020

- Implemented a Variational Autoencoder for a Neural Network Recommender System.
- Improved the recommendation performance with a further enhanced hybrid framework, increasing **10%** of the Mean Average Precision (MAP) measurement.
- Evaluated model reliability and effectiveness using sensitivity analysis and metrics such as NDCG and MAP.

### *First-Place Capstone Project: In-car Conversational Recommender System* Sep 2019 – May 2020

- Designed and built a robust personalized in-car restaurant recommender system for iNAGO Inc. with core features such as recommendation explanations that were demoed in CES 2019.
- Analyzed Yelp dataset by leveraging skills and knowledge in Information Retrieval and Sentiment Analysis to extract information from **6 million** review data and to construct informative description for recommendations.
- Programmed the explanation and critiquing processes for the system which enable sequential recommendations through interactive conversational interactions.

### *AI Course Project: Automotive Vehicle Make Recognition System* Jan 2020 - May 2020

- Built a deep supervised transfer learning model with AlexNet and VGG-19 for classification of vehicle make.
- Preprocessed **16K+** image data with **200** different class labels from open-source dataset.
- Performed both quantitative and qualitative analysis with a confusion matrix and feature extraction techniques.

## WORK EXPERIENCE

### *Applied Machine Learning Intern, Vector Institute* Sep 2021 – Present

- Perform research and implementation of conversational recommender systems using pre-trained language models (e.g., BERT) with large public datasets including Yelp and Reddit.
- Provide documentation and develop open-source software for applying AI research techniques to common problems

### *Data Engineer, RBC (Return offer received)* May 2020 – Sep 2020

- Assisted deliverables as a data engineer by developing solutions on Hadoop utilizing HQL/Hive and Python.
- Developed infrastructure to manage and process **15TB/week**, reducing **10%** of the data management effort.
- Performed complex large volumes data analysis, created Machine Learning projects for time-series data.

### *Test Automation Engineer, Intact Financial Corporation (Return offer received)* May 2018 - Sep 2019

- Built and maintained various automation testing frameworks using Selenium and SoapUI to support UI and API services testing respectively for system deployment, reducing **70%** system testing time.
- Created functional and regression automation test scripts in different programming languages including Java, Python, JavaScript, and Ruby to analyze system behaviors based on business requirements.

## TECHNICAL SKILLS

- Programming Languages: Python, Java, SQL, MATLAB, JavaScript, C#, Gurobi
- Python Frameworks: PyTorch, Numpy, Pandas, Tensorflow, Scikit-Learn