Yuesong Zou

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INTERESTS

Computational Biology, Graph Mining, Graph Representation Learning, Topic Modeling, Multi-modal Healthcare Data Mining, Biomedical Knowledge Graph, Drug Repurposing

EDUCATION

McGill University 2020 - present
MS in Computer Science

· Thesis Advisor: Prof. Yue Li

Tsinghua University 2016 - 2020
BS in Institute of Interdisciplinary Information Science (a.k.a. Yao Class)

· Honored in **Yao Class** (Special Pilot Computer Science Class, founded by Prof. Andrew Yao, world-leading computer scientist, the only Chinese scientist to receive the A.M. Turing Award.)

EXPERIENCE

McGill University Sept. 2020 - present
Master Student, Li lab *Montreal, Canada*

· **End-to-end knowledge graph-informed multi-modal topic model**
Incorporate medical graph knowledge with topic modeling to improve analysis of electronic health record (EHR) data. (accepted by *Scientific Reports*)

· **Phecode-guided multi-modal topic model**
leverage designed phenotypes to align latent phenotype topics that are learned from a multi-modal hierarchical Bayesian topic model. (accepted by *Journal of Biomedical Informatics*.)

Tsinghua University Sept. 2019 - June. 2020
Thesis Student, advised by Prof. Xuegong Zhang *Beijing, China*

· **Recognizing and Defining Cell Types by Machine Learning**
Built a machine learning model to extract feature of single cell sample, to classify cells by their types. Our model is able to distinguish unseen cell types from seen types. When provide single cell data of multiple cell types, our model is able to identify the differentiation process among them.

Carnegie Mellon University Apr. 2019 - Sept. 2019
Visit Research Intern, Ma Lab *Pittsburgh, United States*

· **Hyper-edge Embedding in Graph Neural Networks**
Designed a novel graph learning model to extract latent embeddings of hyper-edges based on attention mechanism. (accepted by *ICLR 2020*)

Tsinghua Univeristy Nov. 2018 - Mar. 2019
Research Assistant, Zeng Lab *Beijing, China*

· **T Cell Receptor α, β-Chain Pairing Work**
Developed a deep learning branch model for T cell receptor (TCR) α, β-chain pairing problem, and proposed a precision metric for TCR pairing methods.

Nanyang Technological University Jan. 2019
Winter School *Singapore*

· **NTU-Tsinghua Theoretical Computer Science Winter School**

Megvii Research (led by Dr. Jian Sun, author of "*residual net*") Nov. 2017 - Sept. 2018
Research Intern, Megvii Research *Beijing, China*

- **Occluded Face Recognition:**
  Designed an occluded faces (e.g. occluded by masks / sunglasses) recognition model by introducing a fidelity weight for occlusion recognition and a weighted distance among the features of occluded faces.
- **Synthetic Infrared Image Dataset Generating**
  Modified CycleGAN to generate labeled infrared photos from normal photos for data-scarce circumstance in recognition model training.

Chinese University of Hong Kong, Shenzhen Jan. 2018
Winter Camp Program *Shenzhen, China*

- **"Robotics & Big Data", The 2018 Partnership Program Between CUHK-SZ and THU**

PUBLICATIONS

- Modeling electronic health record data using an end-to-end knowledge-graph-informed topic model
  Scientific Reports, vol. 12,1 17868. 25 Oct. 2022.
  Yuesong Zou, Ahmad Pesaranghader, Ziyang Song, Aman Verma, David Buckeridge, Yue Li
- MixEHR-Guided: A guided multi-modal topic modeling approach for large-scale automatic phenotyping using the electronic health record,
  Journal of Biomedical Informatics, vol. 134 (2022): 104190.
  Yuri Ahuja, **Yuesong Zou**, Aman Verma, David Buckeridge, Yue Li
- Hyper-SAGNN: a self-attention based graph neural network for hypergraphs
  International Conference on Learning Representations (ICLR) 2020, pdf
  Ruochi Zhang, **Yuesong Zou**, Jian Ma

PRESENTATIONS

- Modeling electronic health record data using an end-to-end knowledge-graph-informed topic model, *McGill School of Computer Science 50th anniversary celebration*, poster presentation.

SELECTED HONORS AND AWARDS

- **Full scholarship** from McGill University during MSc. studies. 2020, 2021, 2022
- **2nd place** twice in McGill NP Compete Programming Competition 2021, 2022
- **5th** in International Collegiate Programming Contest (ICPC), Northeast North America 2022
- 28th place **(1st place in Canada)** in IEEEXtreme Programming Contest 2021
- **Xuetang Scholarship** of Tsinghua University 2017, 2018, 2019
- **Full scholarship** during one-term visit at Carnegie Mellon University 2019
- **Academic Excellence Award** of Tsinghua University 2017
- **Gold** in Asia-Pacific Informatics Olympiad (APIO) 2015
- Silver in Chinese National Olympiad Informatics (NOI) 2015
- Honorable mention in Mathematical Contest in Modeling 2018

PROFICIENCIES

- Tools & Languages: Python, C/C++, R, Matlab, PyTorch, scikit-learn, pandas, matplotlib, Git, Vim
- Machine Learning Background: Topic Models, Generative Models, Knowledge Graph, Graph Learning, Data Analysis / Visualization, Algorithms, Data Structures.
- Communication: English, Mandarin.

SERVICES

- Reviewer of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD '22).
- Reviewer of the 30th Conference on Intelligent Systems for Molecular Biology (ISMB 2022).
- Lecturer of International Collegiate Programming Contest (ICPC) Summer School at Lanzhou University (2021).