(613) 770-3985
Toronto, Canada
simon.zhou@mail.utoronto.ca

Meng Zhou

Data Scientist / Machine Learning Engineer

Website: Academic Page
Github: simonZhou86
Linkedin: meng-zhou

A current Computer Science Master's student at the University of Toronto with various experiences in Data Science (DS) and Machine Learning (ML). Seeking full-time positions in DS/ML-related fields.

Education

Master of Science in Computer Science, *University of Toronto*, Supervisor: Prof. Farzad Khalvati — Expected Jan. 2024
Bachelor of Computing Honors in Computing and Mathematics, *Queen's University* — June 2022
Ontario Graduate Scholarship, University of Toronto — 2022 — 2023
Department of Computer Science Fellowship, University of Toronto — 2022 — 2023
Mergelas Family Graduate Award, University of Toronto — 2022 — 2023
John Ursell Tutor Award, Queen's University — 2020 — 2021

Technical Experience

Graduate Machine Learning Researcher — **Sept. 2022 — Present**
SickKids Research Institute, The Hospital for Sick Children — *Toronto, Canada*

- Collaborated closely with PI and neuroradiologists to develop and implement deep generative models for enhancing the diagnosis of Pediatric Low-Grade Gliomas at the Intelligent Medical Imaging Computing System Lab.
- Pioneered an innovative approach by introducing a novel vector quantization GAN model to produce high-fidelity MRI scans of brain tumors under a data-constrained regime.
- Evaluated the synthetic MRI scans on both image quality-based metrics and on a downstream tumor classification task, showcasing remarkable performance advancements of up to 6% in AUC compared to various baseline models.

Machine Learning Engineer Intern — **Apr. 2021 — July 2021**
Ghawar, The Illuminera Group — *Shanghai, China*

- Collaborated with the Program Manager and Senior Algorithm Engineers to develop an end-to-end AI framework for customer behavior analysis.
- Retrieved over 1 million image data from the database using PySpark SQL and automated data pipelines to extract image data using Python and Hadoop.
- Implemented the Perceptual-Hash algorithm to systematically eliminate redundant images that are 90% or more similar to the other images in the database, significantly optimizing computational costs.
- Built the ResNet-50 model with 99% categorical accuracy, increasing the accuracy by 20% and optimizing the prediction time by 10%. Fine-tuned the Yolov5 model that achieved 98% in precision, recall, and mAP.
- Deployed the models online using Docker to support other teams in the analysis of customer's behavior.

Undergraduate Machine Learning Researcher — **Sept. 2021 — Aug. 2022**
Queen's University — *Kingston, Canada*

- Worked on Prostate Cancer Detection using MRI data under the supervision of Prof. Parvin Mousavi.
- Developed a GAN-based framework to translate unpaired prostate multi-parametric MRIs from 3.0T to 1.5T to address the data-hungry problem in medical imaging.
- Proposed a novel evidential focal loss based on the evidential uncertainty estimation and the original focal loss under the imbalanced data setting. Demonstrated a huge improvement by outperforming the state-of-the-art method by over 10% in AUC.
- Our work has been accepted for the Pitch and Poster Presentation at ImNO2022. Preprint is available at here.

Medical Image Fusion — **Nov. 2022 — Dec. 2022**
Course Project

- Proposed a novel Dilated Residual Attention Network for anatomical-functional medical image fusion task on 184 MRI-CT pairs.
- Developed a new fusion strategy based on the Softmax weights, which outperformed the state-of-the-art methods by 12.97% on PSNR and 1.49% on Feature-based SSIM.
- Presented at the Inaugural Computational Imaging Poster Session. The project paper is available at here.

Skills

Programming Languages	Python, R, Java, C++, HTML, PHP, Haskell, Prolog, PHP
Frameworks	PyTorch, OpenCV, Nilearn/SITK, Scikit-Learn, NumPy, TensorFlow/Keras, Pandas, PySpark, Hadoop
Tools/Platforms	SQL, MATLAB, Tableau, SAS, LaTeX, Linux, AWS

Activities

Reviewer, DGM4MICCAI Workshop at MICCAI 2023 Conference — 2023
Teaching Assistant for various CS courses from introductory First-year Python to Computer Vision fundamentals — 2019-2023
Research Poster Presenter at Imaging Network Ontario 2022 — Spring 2022
Research Poster Presenter at Vector Institute Research Symposium 2022 — Spring 2022