YIMING JIA

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EDUCATION

Department of Computer Science, University of Toronto *Sep. 2023 - Jun. 2025*
M.Sc. in Applied Computing(MScAC) *Toronto, Canada*
Core Courses: Neural Networks and Deep Learning, Computational Imaging, Topics in Storage Systems

School of Computer Science, Beijing University of Posts and Telecommunications *Sep. 2019 - Jun. 2023*
B.E. in Software Engineering, GPA: 92.04/100 (3.83/4.0), Ranking: 1/178 *Beijing, China*
Core Courses: Principles of Operating Systems (95), Algorithms and Data Structures (93), Principles of Database Systems (93), **C**ompiler Principle and Technology (94), Computer Networks (95)

PUBLICATION

Jia, Y., Wu, H., & Ding, J. (2023). scGeneRythm: Using Neural Networks and Fourier Transformation to Cluster Genes by Time-Frequency Patterns in Single-Cell Data. bioRxiv. https://doi.org/10.1101/2023.11.26.568761

RESEARCH EXPERIENCE

Research Intern; Advisor: Prof. Jun Ding *May 2022 - Nov. 2023*
Meakins-Christie Laboratories, McGill University *Montreal, Canada (remote)*

- Analyzed and preprocessed time-series single-cell data using **PCA**, **UMAP**, **Clustering**, **FFT**.
- Proposed a unique way to represent genes with frequency domain data.
- Devised and trained whole pipeline intergrated **GCN+VAE** model to derive gene embeddings.
- Proved the strong biological significance of the embeddings through **GO Enrichment Analysis**.
- Conducted ablation experiment to prove the significance of FFT.
- Our paper is currently under review by RECOMB. More detailed information inside.

Research Intern; Advisor: Prof. Chuan Shi *Mar. 2022 - Jun. 2022*
GAMMA Lab, Beijing University of Posts and Telecommunications *Beijing, China*

- Contributed to GammaGL and implemented **JK-net** based on TensorLayerX.
- Reproduced and optimized the experimental results of JK-net and APPNP in GammaGL.
- Compared the different performances of **graph neural networks** on different backends and analyzed the reasons.

WORK EXPERIENCE

New Software Development Department, Sony *Jul. 2022 - Feb. 2023*
Edge AI Engineer Intern *Beijing, China*

- Reproduced and trained **CenterMask** based on **Google object detection API**(**MobileNetV2**) with the Fashionpedia dataset to acheive fine **instance segmantation** of clothing.
- Optimized segmentation performance of the model in PC simulations. Simplified, quantified, and transplanted my model to **Sony IMX-500 chips** (Float32 to Int8).
- Designed and implemented **Convolutional Autoencoder** to compress the size of segmentation output and meet the Wi-Fi module's bandwidth demands.
- Evaluated the ultimate performance of my model on IMX-500 chips under real-world scenarios.

PROJECTS

Computational Imaging Course Project——FA-UNet *Sep. 2023 - Dec. 2023*

- Designed and implemented an **Attention-UNet**-based frequency domain image denoising and deblurring model.
- Proposed a 3-stages training pipeline for the model to improve denoising and deblurring performance.
- Both of our project code and final report are available on GitHub.

Topics in Storage System Course Project——Caching Strategies of DQN *Sep. 2023 - Dec. 2023*

- Implemented **RL-based** caching algorithms for CDNs, using **DQN** and **A2C** to improve cache utilization and adapt to changing content requests.
- Demonstrated marked enhancement in cache hit rates and network performance over traditional caching strategies, showcasing RL's efficacy in CDN optimization.