

## Rom Uddamvathanak

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### Education

#### MONASH UNIVERSITY

Master of Data Science

VIC, Australia

2021

Thesis: Joint Graph-Sequence Learning for Molecular Property Prediction (IJCNN)

Relevant Coursework: Big Data, Apache Spark, Data Life Cycle, Calculus, AI, Machine Learning, Deep Learning.

#### COVENTRY UNIVERSITY

Bachelor of Science with Honours in Computer Science, First Class Honours

Singapore

2019

Thesis: Two-stage ensemble of Deep Convolutional Neural Networks for Object Recognition (ICIRT)

Relevant Coursework: Algorithm and Data Structure, Software Engineering, Agile Development, Web & Mobile Development, Open-source development.

### Experience

#### A\*STAR

##### Senior Research Officer

Singapore

2022 - Present

- Developed innovative computational solutions to improve the accuracy and reliability of Single Cell RNA-seq data analysis, addressing the critical issue of batch integration.
- Played a pivotal role in the development and maintenance of DISCOToolkit Python version, a powerful and widely used toolkit that hosts variety annotated atlases data and enables seamless batch integration for Single Cell RNA-seq data.
- Applied in-depth knowledge of computational biology, deep learning, and generative AI to enhance the understanding of human Single-Cell Omics data and develop reliable tools for data analysis.
- Served as a reviewer for the International Society for Computational Biology (ISCB), contributing to the evaluation of high-quality research in the field of computational biology.

#### Papers:

- SEDR: Unsupervised Spatial Embedded Deep Representation of Spatial Transcriptomics. (Genome Medicine, Co-author)
- GENEX: Predicting Cellular Response to perturbation at transcriptomic level using Generative AI. (NMI 2024) (Under Preparation)

#### Project:

- Deeply Integrated human Single-Cell Omics data: [DISCOToolkit](#) is an python package that allows users to access data and use the tools provided by the [DISCO database](#) (11,000 Downloads).

#### Other Roles:

- Verifying Officer, effectively managing and approving requests within the team.
- Server Manager, ensuring the smooth operation and maintenance of server infrastructure for research and development activities.
- Solving issues related to programming and server for the team.

### Leadership & Activities

#### Kaggle

##### Casual Machine Learning Practitioner

Jun 2018 – Present

- Actively participate in competitions and browse through discussion forums to continuously expand my skill set and stay abreast of the latest advancements in machine learning and deep learning.
- Achieved notable success in various competitions, including earning a Silver Medal in the Fraud Detection competition, demonstrating a strong ability to apply machine learning techniques to solve real-world problems.
- Engage in a wide range of machine learning competitions, such as iceberg detection, forecasting classification, predicting molecular properties, and Jigsaw Toxicity Classification, continuously seeking new skills and insights for self-development and expanding my expertise in various domains of machine learning.

#### Monash University

##### Research Student

Nov 2020 – Jun 2021

- Developed a novel end-to-end Joint Graph-Sequence fusion framework for learning high-quality molecular property

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representations by jointly capturing information from both graph and sequence molecular data.

- Proposed an attentional feature fusion mechanism to effectively integrate graph-sequence molecular embeddings, enhancing the model's ability to extract meaningful information from both modalities.
- Demonstrated the effectiveness of the proposed method by achieving state-of-the-art performance on multiple datasets, including SARS-CoV, outperforming existing models by a significant margin.
- Presented the research findings at the prestigious International Joint Conference on Neural Networks (IJCNN), a leading conference in the field of artificial intelligence.

## Monash University

### FIT Peer Mentor

Mar 2020 – Jul 2020

- Provided valuable support and guidance to junior students as a FIT Peer Mentor, fostering a collaborative learning environment and contributing to a positive and inclusive learning experience.
- Assisted junior students with understanding unit content and navigating their academic pursuits, enhancing their academic success.
- Facilitated group discussions and workshops to promote peer-to-peer learning and knowledge sharing, enabling students to overcome challenges and develop their skills.
- Effectively communicated complex concepts and strategies to junior students, acting as a role model and mentor to guide their academic journey.

## Skills & Interests

### Technical (Research & Industry):

**Programming Languages:** Python (Main), R, Java, JavaScript, C++, C, Bash

**Machine Learning Package:** Pytorch, Keras, Tensorflow, scikit-learn, MATLAB, Optuna, Captum

**Cloud Computing:** Google Cloud Platform, Microsoft Azure, Amazon Web Services

**Database:** MySQL, MongoDB, Apache Spark

**Data:** Data Cleaning, Data Engineering, Data Analysis & Interpretation

**Bioinformatic Tools:** DNBelab C Series HT Single-Cell Analysis Software (MGI)

### Language:

**English:** Fluent

**Khmer:** Mother Tongue

### Interests:

**Technical Exploration:** Generative AI, Large Language Model, Explainable AI, Sparse Data Processing, Big Data, Computational Biology, Multi-modal, Computer Vision, Graph Neural Network, Image Processing, Natural language Processing, Pattern recognition, Spatial Computing.

**Continuous Learning:** Theoretical understanding in Deep Learning and Machine Learning, Responsible AI, Machine Learning Engineer through Cloud Platform, DevOps, MLOps, Software Development.

**Personal Development:** Leadership skills and Learning Pathway through LinkedIn Learning.

## Publications

### Published:

- (1) Longqi Liu & Jinmiao Chen, Hang Xu, Huazhu Fu, Yahui Long, Kok Siong Ang, Raman Sethi, Kelvin Chong, Mengwei Li, Rom Uddamvathanak, Hong Kai Lee, Jingjing Ling, Ao Chen, Ling Shao. 2024. *Unsupervised spatially embedded deep representation of spatial transcriptomics*, *Genome Medicine*.
- (2) Rom Uddamvathanak, Xin Zheng, Shirui Pan. 2021. Joint Graph-Sequence Learning for Molecular Property Prediction. *International Joint Conference on Neural Networks (IJCNN) at 2022 IEEE World Congress on Computational Intelligences*.
- (3) Rom Uddamvathanak, Feng Yang, Xulei Yang, Ankit Kumar Das, Yan Shen, Mohamed Salahuddin, Shaista Hussan, Shailey Chawla. 2018. Two-Stage Ensemble of Deep Convolutional Neural Networks for Object Recognition. *The 2018 International Conference on Intelligent Rail Transportation*.

## Websites

**LinkedIn:** Rom Uddamvathanak

Google Scholar

Google Cloud Profile

GitHub

Leetcode

**Personal Website:** <https://uddamvathanak.github.io/Rom-Uddamvathanak/>