

Rom Uddamvathanak

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Adaptable and results-oriented AI Engineer with 5 years of experience and deep expertise in Deep Learning, Data Science, and Generative AI (including RAG and LLMs). Proven ability to develop impactful solutions, demonstrated by contributions to DISCOToolkit (24K+ downloads) at A*STAR, enhancing single-cell RNA-seq analysis, and creating novel predictive models for drug discovery. Strong proficiency in Python, PyTorch, TensorFlow, and cloud platforms (GCP, Azure, AWS). Seeking to leverage advanced machine learning skills to solve complex problems and drive innovation in AI-driven healthcare or Fintech.

RECENT EXPERIENCE

AI Engineer | Jan 2022 - Present

A*STAR - Agency for Science, Technology and Research, Singapore

- **AI Healthcare Contribution:** Actively contributing to an AI healthcare spin-off initiative, applying machine learning techniques to advance personalized medicine and accelerate drug discovery pipelines partnering with **Google**.
- **Advanced Drug Discovery with Deep Learning:** Developed a novel Deep Learning model from scratch using PyTorch for predicting drug treatment responses at single-cell resolution. Expanded model capabilities to include temporal predictions, significantly improving simulation reliability for drug discovery applications.
- **Enhanced Widely-Used Bioinformatics Toolkit:** Contributed significantly to the development and maintenance of [DISCOToolkit](#) (24K+ downloads, published in Nucleic Acids Research), a leading Python toolkit for single-cell RNA-seq analysis. Focused on improving downstream analysis reliability and accessibility, potentially enabling specific new analyses.
- **Ensured Research Continuity:** Managed and maintained critical server infrastructure, achieving 99.9% uptime for research and development activities, supporting uninterrupted workflow and maximizing team productivity.
- **Collaborated with Cross-Functional Teams:** Worked closely with biologists, bioinformatic to define requirements, integrate solutions, and translate research findings into practical applications.

Papers Under Preparation:

- CellGen: Computational Modelling of Cellular Responses to Diverse Perturbations Using Single-Cell RNA Sequencing. (NMI 2024)

Research Student | Nov 2020 - Jun 2021

Monash University, Melbourne, VIC

- **Improved Molecular Property Prediction:** Developed a novel graph-sequence fusion framework combining Graph Neural Networks (GNNs) and sequence models for enhanced molecular property representation. Achieved an **8.1% improvement** in predictive accuracy on benchmark datasets, including SARS-CoV antivirals.
- **Innovated Feature Fusion:** Designed and implemented an attentional feature fusion mechanism to effectively integrate diverse molecular data modalities, boosting model performance and interpretability in predictive tasks.
- **Presented at Premier AI Conference:** Presented research findings on the joint graph-sequence learning framework at the prestigious International Joint Conference on Neural Networks (IJCNN 2022), showcasing innovative methodologies to leading AI experts.

EDUCATION

Master of Science (M.S.) - Data Science | Jul 2019 - Jun 2021

Monash University, Melbourne, VIC

Awards: International Study Grant Offer & Summer Research Scholarship

Bachelor of Science (B.S.) - First Class Honours | 2017 - 2019

Coventry University, Coventry, UK

SKILLS

- **Core Competencies:** Generative AI (LLMs, RAG), Deep Learning, Data Science, NLP, Machine Learning, MLOps, Predictive Analytics, Statistical Analysis, Data Modeling, Algorithm Development, Research Methodology, Project Management, Visualization
- **Programming Languages:** Python (Advanced), R (Proficient), SQL, Java, JavaScript, C++, C, Bash
- **Machine Learning Frameworks & Libraries:** PyTorch, TensorFlow, Keras, Scikit-learn, LangChain & LangGraph, Hugging Face Transformers, Optuna, Captum
- **Tools & Platforms:** FastAPI, Streamlit, Docker, Git, Ollama
- **Cloud Computing:** Google Cloud Platform (GCP), Microsoft Azure, Amazon Web Services (AWS)
- **Databases:** MySQL, MongoDB, Apache Spark
- **Soft Skills:** Effective Communication, Leadership, Collaboration, Cross-Cultural Awareness, Problem Solving, Relationship Building

SIDE PROJECTS

- **Deep Researcher scRNA:** Developed a research assistant leveraging Tavily API for literature search and local LLMs (via Ollama) for text generation/analysis, specifically tailored for single-cell RNA sequencing research. (*Tech Used: Python, Multi-agent Systems, Prompt Engineering, Ollama, Tavily API*)
- **Local PDF RAG Chatbot:** Built a system enabling users to interact conversationally with PDF documents locally using Retrieval Augmented Generation (RAG) and Ollama LLMs. (*Tech Used: Python, Langchain, RAG, Generative AI, Ollama, Vector DB*)
- **From Zero to LLM:** Created a personal learning repository documenting hands-on experiments, tutorials, and projects exploring LLM fine-tuning, prompt engineering, and applications. (*Tech Used: Python, LLMs, LangChain, Ollama, Prompt Engineering*)
- **FastAPI ML Deployment:** Demonstrated deployment of ML models as high-performance APIs using FastAPI, including a guide for deployment on Heroku. (*Tech Used: Python, FastAPI, Scikit-learn, MLOps, API Development, CI/CD, Docker, Heroku*)
- **Forex Price Movement Prediction Dashboard:** Implemented a dashboard for Forex analysis and prediction using Alpha Vantage data and Facebook Prophet time series forecasting. (*Tech Used: Python, Prophet, Pandas, Quantitative Finance, Alpha Vantage API*)
- **IEEE-CIS Fraud Detection (Kaggle):** Developed and optimized machine learning models for detecting fraudulent transactions, achieving Top 3 Percentile ranking in the competition. (*Tech Used: Python, Pandas, Scikit-learn, XGBoost/LightGBM*)

PROFESSIONAL CERTIFICATES

- [Deep Learning Specialisation](#) by Deep Learning.ai
- [Machine Learning Specialisation](#) by Stanford University & Deeplearning.ai
- [AWS Cloud Solutions Architecture](#) Specialization
- [Google Advanced Data Analytics Certificate](#)
- [Microsoft Azure Data Scientist Associate \(DP-100\)](#)
- [IBM AI Developer](#)
- [JPMorgan Chase & Co. - Quantitative Research Job Simulation](#)

RECENT PUBLICATIONS

- (1) Mengwei Li, Kok Siong Ang, Brian Teo, [Uddamvathanak Rom](#), Minh N Nguyen, Sebastian Maurer-Stroh, Jinmiao Chen. Rediscovering publicly available single-cell data with the DISCO platform. 2024. *Nucleic Acids Research*
- (2) 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*
- (3) [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*.