

Do Tam Thuc

Toronto, ON | dotamthuc@gmail.com | 647 917 6061 | <https://scholar.google.com/dotamthuc>
<https://www.linkedin.com/in/tam-thuc-do-b7a1b3145/> | tamthuc1995.github.io

Technical skills

Languages: Python, C++, C, JavaScript.

Big data analysis: Pyspark, SQL, Apache Spark, Hadoop.

Machine Learning & Deep Learning: Sklearn, XGboost, Tensorflow, Pytorch, Jax.

High performance computing: CUDA.

Cloud platform: Google cloud platform (GCP), Saturn cloud platform (through NVIDIA grant program).

Graphic Programming: OpenGL, Physical based rendering.

Compression-related algorithms: Region-adaptive hierarchical transform, DCT, Wavelet transform, Arithmetic Coding, Run-Length Encoding.

3D graphic related: 3D Gaussian Splatting Learning. Voxels scattering learning

Experience

PhD student/Research Assistant, York University – Toronto, ON

September 2021 – Present

- Developed interpretable deep learning model that gave **SOTA compression performance** for 3D points cloud attributes. We gain $> 0.7\text{dB}$ PSNR over the standard compression algorithms and $\sim 10\%$ reduction in term of bit-rate.
- Developed mathematical interpretable lightweight deep learning transformer models, which leads to **more transparent, cost efficient and computationally manageable development process**.
- Wrote multiple published papers for various conferences: NIPS, ICASSP, ICIP

Google student researcher, Google – Toronto, ON

April 2022 – April 2023

- Conducting **research for compressing non-traditional types of media**, including volumes, 3D meshes.
- Developed **interpretable deep learning models** for sparse 3D point cloud compression.

Data scientist, Trusting Social (Singapore based) – Ho Chi Minh, Viet Nam

August 2017 – July 2021

- Designed and implemented locations/moving feature extraction pipeline to **capture telecom user behavior patterns** (using Apache Spark and Hadoop computing cluster). These additional features help improve Area Under the ROC Curve by 0.5%.
- Using machine learning tools (XGBoost) to predict the credit risk of **0.5 billions telecom users** in India, Indonesia, Viet Nam (IDEA, Airtel, Telkomsel, Viettel).
- Combining deep learning models with stability constraints to **improve model robustness to telecom users behavior changes** due to drastic social/economy events (Ex: Covid pandemic).

Machine Learning Engineer, Bioturing (US based) – Ho Chi Minh, Viet Nam

2016–2017

- Using machine learning tools to differentiate normal and disease samples using **gene expression**.
- Developed **visualization platform for high dimension data** using dimension reduction methods (PCA, t-SNE).
- Developed pipeline to analyze gene expression, protein dependency networks.

Education

PhD in Computer Science, York University

Sept 2024 – Present

- Research topic:* Mathematical interpretation for deep learning models architecture design.

Awards: VISTA Graduate Scholarship (\$26,000), NVIDIA research grant (16K A100 GPU-Hours - team effort)

Msc in Computer Science, York University

Sept 2021 – Sept 2023

- Thesis:* Volumetric Attribute Compression for 3D Point Clouds with Geometric Attention.

Awards: VISTA Student Conference Travel grant (\$2250), 2-year fully funded graduate program.

BS in Applied Mathematics, Ho Chi Minh International University

Sept 2013 – Sept 2018

- Coursework:* Abstract Linear Algebra, Optimization, C/C++ programming language, Probability and Statistic

Awards: Full 4-years Scholarship

Publications

Deep Unrolling of Sparsity-Induced RDO for 3D Point Cloud Attribute Coding -
Do Tam Thuc, P. A. Chou and G. Cheung

Pre-print and submitted for
IEEE Transactions on Image
Processing

Learning latent space for multi-order / resolution Graph-regularized image denoiser -
Do Tam Thuc and G. Cheung

Pre-print and submitted for
IEEE Conference on
Acoustics, Speech and Signal
Processing 2026

Interpretable Lightweight Transformer via Unrolling of Learned Graph Smoothness Priors -
Do Tam Thuc, Parham Eftekhar, Seyed Alireza Hosseini, Gene Cheung, and Philip Chou.

Neural Information
Processing Systems (NISP)
2024

Learned Nonlinear Predictor for Critically Sampled 3D Point Cloud Attribute Compression -
Do Tam Thuc, P. A. Chou and G. Cheung

IEEE International
Conference on Image
Processing (ICIP) 2024

Constructing an Interpretable Deep Denoiser by Unrolling Graph Laplacian Regularizer -
Seyed Alireza Hosseini, Do Tam Thuc, Gene Cheung, Yuichi Tanaka

IEEE International
Conference on Image
Processing (ICIP) 2024

Volumetric 3d Point Cloud Attribute Compression: Learned Polynomial Bilateral Filter for Prediction -
Do Tam Thuc, P. A. Chou and G. Cheung

IEEE International
Conference on Acoustics,
Speech and Signal
Processing (ICASSP) 2024

Volumetric Attribute Compression for 3D Point Clouds Using Feedforward Network with Geometric Attention -
Do Tam Thuc, P. A. Chou and G. Cheung

IEEE International
Conference on Acoustics,
Speech and Signal
Processing (ICASSP) 2023

Hybrid model-based/data-driven graph transform for image coding -
Bagheri, Saghar, Do Tam Thuc, Gene Cheung, and Antonio Ortega

IEEE International
Conference on Image
Processing (ICIP) 2022

Personal Projects (Github)

Lightweight deep learning for Image restoration tasks

- Develop Image restoration learning pipeline for Lightweight Interpretable Deep Learning models.
- Tools Used: Tensorflow, Pytorch.
- Github: <https://github.com/tamthuc1995/ImageRestoration-Development-Unrolling>

Learning Graphic Programming

- Follow the books "Learn OpenGL", and "Physically Based Rendering" to learn the mathematic aspect of real-time graphic rendering
- Tools Used: C++, OpenGL, glm, GLFW
- Github: <https://github.com/tamthuc1995/GraphicProgramming>