

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](https://github.com/tamthuc1995)

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 - <i>Do Tam Thuc, P. A. Chou and G. Cheung</i>	Pre-print and submitted for IEEE Transactions on Image Processing
Learning latent space for multi-order / resolution Graph-regularized image denoiser - <i>Do Tam Thuc and G. Cheung</i>	Pre-print and submitted for IEEE Conference on Acoustics, Speech and Signal Processing 2026
Interpretable Lightweight Transformer via Unrolling of Learned Graph Smoothness Priors - <i>Do Tam Thuc, Parham Eftekhari, Seyed Alireza Hosseini, Gene Cheung, and Philip Chou.</i>	Neural Information Processing Systems (NIPS) 2024
Learned Nonlinear Predictor for Critically Sampled 3D Point Cloud Attribute Compression - <i>Do Tam Thuc, P. A. Chou and G. Cheung</i>	IEEE International Conference on Image Processing (ICIP) 2024
Constructing an Interpretable Deep Denoiser by Unrolling Graph Laplacian Regularizer - <i>Seyed Alireza Hosseini, Do Tam Thuc, Gene Cheung, Yuichi Tanaka</i>	IEEE International Conference on Image Processing (ICIP) 2024
Volumetric 3d Point Cloud Attribute Compression: Learned Polynomial Bilateral Filter for Prediction - <i>Do Tam Thuc, P. A. Chou and G. Cheung</i>	IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2024
Volumetric Attribute Compression for 3D Point Clouds Using Feedforward Network with Geometric Attention - <i>Do Tam Thuc, P. A. Chou and G. Cheung</i>	IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2023
Hybrid model-based/data-driven graph transform for image coding - <i>Bagheri, Saghar, Do Tam Thuc, Gene Cheung, and Antonio Ortega</i>	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>