Thien NGUYEN

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I am an AI Research Engineer at the L3I Lab, CEA-LETI, where I develop hardware-aware machine learning algorithms for computer vision tasks on embedded platforms. Recently, my work has extended to multimodal vision–language models, with a focus on how large language models interact with visual encoders and how to improve their efficiency. I've worked on both inference (e.g., classification, detection) and reconstruction tasks, which has given me a broad view of how AI systems perceive and generate visual data. I received my PhD in Machine Learning and Signal Processing from University of Grenoble-Alpes in 2022. My long-term goal is to help build machine learning systems that are not only efficient and practical but also more interpretable and grounded in solid theoretical principles.

Education

PhD	**University of Grenoble-Alpes**, Machine Learning and Signal Processing	Nov 2019 – Nov 2022
MSc.	**INSA Centre Val de Loire, Blois**, Automative Systems and Signal Processing	Sept 2015 – Aug 2019
Prepa	**University of Hue, Vietnam**, Engineering Student in Preparatory Class	Sept 2013 – Aug 2015

Experience

CEA-LETI, Machine Learning Research Engineer — Grenoble, France — Dec 2022 – Today

- Developed compact, multi-task neural networks with confidence estimation for a variety of computer vision tasks, optimized for real-time performance under stringent hardware constraints
- Designed a novel neural network-based processing pipeline for novel thermal imaging systems; co-inventor on a submitted patent
- Contributed to 3 peer-reviewed publications (ISCAS, AICAS, GRETSI)
- Conducted research in efficient deep learning and edge deployment
- Supervised and mentored Master's students on applied AI research projects

CEA-LETI, PhD Candidate in Machine Learning and Signal Processing — Grenoble, France — Nov 2019 – Nov 2022
Deep Neural Networks hardware-algorithmic enablers for compact ASIC design towards embedded image/video processing

- Designed hardware-compliant DNNs using various techniques such as quantization, pruning, weight-sharing and hypernetwork
- Authored and co-authored five peer-reviewed publications (in IEEE TCSVT, TCI, ISCAS, AICAS and SiPS); submitted a patent on advanced DNN compression using hypernetwork and pseudo random generator

CEA-LETI, Research Intern in Image Processing — Grenoble, France — Feb 2019 – Aug 2019
Design of an ISP for Raw Camera-Sensor Images

- Built a Python development framework complete with thorough documentation, unit tests, and peer code reviews to ensure reliable, maintainable software
- Designed, implemented, and benchmarked advanced image-processing pipelines (*e.g.*, denoising, demosaicing, white-balance...) for raw sensor data

Skills

Tools and Programming: Python, MATLAB, C/C++, R, Markdown, LaTeX
Machine Learning Frameworks: TensorFlow, PyTorch, Scikit-learn, Transformers, vLLM, OpenCV
Data processing frameworks: Numpy, Pandas, Matplotlib
Software frameworks: Gradio, PySimpleGUI, Unittest
AI & NLP: Transformer models, LLMs, VLMs, Fine tuning and knowledge distillation, Data and prompt engineering
Languages: French (fluent), English (fluent), Vietnamese (mother tongue)

Publications

SmartNMC: A 1Mb-200µW-20fps near-imager spatio-temporal inference hardware module — 2025
William Guicquero, Nicolas Pelletier, **Thien Nguyen**, Jean-Phillipe Noel, Manuel Pezzin, Marjorie Gary, Sylvain Choisnet
IEEE Symposium on Circuits and Systems (ISCAS), London, 2025

End-to-End Fully-Binarized Network Design: From Generic Learned Thermometer to Block Pruning (Oral) — 2025
Thien Nguyen, William Guicquero
IEEE Conference on Artificial Intelligence Circuits and Systems (AICAS), Bordeaux, 2025

MDGNet: a light-weight, hardware-compliant Convolutional Neural Network for efficient image inference tasks (Oral) — 2023
Thien Nguyen, William Guicquero
Colloque sur le traitement du signal et des images (GRETSI), Grenoble, 2023

BILLNET: A Binarized Conv3D-LSTM Network with Logic-gated residual architecture for hardware-efficient video inference (Oral) — 2022
Thien Nguyen, William Guicquero, Gilles Sicard
IEEE Workshop on Signal Processing Systems (SiPS), Rennes, 2025

MOGNET: A Mux-residual quantized Network leveraging Online-Generated weights (Oral) — 2022
Thien Nguyen, William Guicquero, Gilles Sicard
IEEE Conference on Artificial Intelligence Circuits and Systems (AICAS), Incheon, 2022

Histogram-Equalized Quantization for logic-gated Residual Neural Networks (Oral) — 2022
Thien Nguyen, William Guicquero, Gilles Sicard
IEEE Symposium on Circuits and Systems (ISCAS), Austin TX, 2025

Luminance-depth reconstruction from compressed time-of-flight histograms (Journal) — 2022
Valentin Poisson, **Thien Nguyen**, William Guicquero, Gilles Sicard
IEEE Transactions on Computational Imaging (TCI), 2022

A 1Mb mixed-precision quantized encoder for image classification and patch-based compression (Journal) — 2022
Thien Nguyen, William Guicquero, Gilles Sicard
IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2022

Patents

Full-resolution estimation of temperature-emissivity from multispectral thermal infrared imaging, **Thien Nguyen**, William Guicquero — 2024

Deep Neural Networks with on-the-fly generated weights from Automatic Number Generators, **Thien Nguyen**, William Guicquero — 2022

Projects

Image restoration using sparse representation and K-SVD — Sept 2018 - Dec 2018

- Analyzed, implemented and evaluated a unified method for image denoising and inpainting based on sparse coding and K-SVD (inspired by this paper)
- Tools Used: Numpy, Scikit-learn, OpenCV

Image denoising by BM3D — June 2018 - Aug 2018

- Re-implemented and evaluated the classical image denoising method BM3D
- Tools Used: Numpy, Scikit-learn, OpenCV

Student Supervisions

Revisiting Local Binary Patterns for Boosting the Efficiency of Deep Neural Networks — Feb 2025 - Aug 2025
Aymane Lahgazi (Master 2 Internship, MATMECA Bordeaux)

Distinctions

Student Participation Grant, IEEE ISCAS — 2022