Nam Nguyen

nguynam4@oregonstate.edu | Linkedin | Github | Google Scholar | 458-272-7520

OBJECTIVE

Looking for a Machine Learning & AI internship position focused on neural data compression, computer vision, and generative modeling - applying advanced information-theoretic frameworks and deep learning to build high-impact intelligent systems.

TECHNICAL SKILLS

- **AI/ML:** Image/Video Compression, Computer Vision, Deep Generative Models, Diffusion Model
- **Quantitative Research:** Mathematical Modeling, Optimization, Statistics & Probability Theory
- **Programming Languages:** Python, MATLAB, C/C++
- **Frameworks/Tools:** PyTorch, TensorFlow, CompressAI, CVX

WORK EXPERIENCE

Communications and Signal Processing Group **Corvallis, Oregon, USA**
Ph.D. Research Assistant **Mar. 2022 - Present**

Perception-based Image Denoising via Generative Compression

- Designed a perception-driven denoising framework using entropy-coded latent representations to control the rate-distortion-perception tradeoff.
- Developed two conditional generative-compression denoisers using GAN- and diffusion-based reconstruction to improve perceptual image quality.
- Built a PyTorch training and evaluation pipeline and benchmarked on Kodak/DIV2K (synthetic noise) and FMD/SIDD (real noise) using PSNR/SSIM and perceptual metrics.
- **Outputs:** 1 conference paper submission

Cross-Domain Lossy Compression via Rate- and Classification-constrained Optimal Transport

- Developed a unified compression framework integrating bit-rate, distortion, classification, and perceptual constraints for robust cross-domain generalization.
- Implemented deep compression models (Autoencoder, WGAN) in Python with differentiable quantization and entropy-constrained losses for image restoration tasks (super-resolution, denoising, inpainting).
- Validated on ImageNet and Kodak datasets, showing strong theory-to-practice alignment.
- **Outputs:** 1 accepted conference paper and 1 journal paper manuscript.

Universal Rate-Distortion-Classification (RDC) Representations for Lossy Compression

- Designed a trainable RDC objective coupling rate, distortion, and accuracy to learn semantic representations for compression and downstream inference.
- Built deep compression models in Python with differentiable quantization, entropy- and classification-constrained losses, producing empirical RDC curves.
- Demonstrated the learned latent features on MNIST and SVHN datasets serve as compact codecs supporting classification with minimal accuracy loss versus specialized encoders.
- **Outputs:** 1 accepted conference paper, 1 conference paper submission, 1 journal paper submission.

Design and security analysis of symbol error probability-based beamforming in MIMO wiretap channel

- Developed the mathematical model and PHY signal design for a MIMO beamforming system and proposed a novel low-complexity algorithm to solve optimization problems in the form of non-convex.
- Conducted numerical experiments in MATLAB to evaluate the proposed beamforming scheme.
- **Outputs:** 1 published conference paper & 1 submitted journal paper.

Deakin University Applied Artificial Intelligence Initiative **Burwood, Victoria, Australia**
Machine Learning Research Intern **Jul. 2025 - Sep. 2025**
AI agentic negotiation

- Extended a multi-agent negotiation evaluation framework, automated experiments, and reproducibility across local LLM models (e.g., LLaMA/Qwen families).
- Implemented belief updates and offer-counteroffer dynamics, designed metrics and dashboards for comparative analysis.

Wireless Systems and Applications Lab **Hanoi, Vietnam**
Research Assistant **Mar. 2019 - Mar. 2023**
Design and Security Analysis of Satellite-based Free-Space Quantum Key Distribution (QKD) Systems for Wireless and Vehicular Networks

- Designed and evaluated satellite-based QKD architectures, incorporating link-layer retransmissions, relaying schemes, and security performance metrics.
- Conducted MATLAB-based simulations to quantify performance and validate analytical results.
- **Outputs:** 2 published conference papers & 2 published journal papers.

EDUCATION

Oregon State University **Mar. 2022 - Mar. 2027 (Expected)**
Ph.D. in Electrical & Computer Engineering Corvallis, OR, US
Minor in Artificial Intelligence
Topics: Neural Data Compression, Machine Learning, Information Theory

Oregon State University **Mar. 2022 - Dec. 2024**
M.S. in Electrical & Computer Engineering Corvallis, OR, US
Thesis: *On Minimizing Symbol Error Probability using Beamforming in MIMO Wiretap Channels*

SELECTED PUBLICATIONS

2 journal articles, 5 conference articles. A detailed list of publications is available here.

[1] **Nam Nguyen**, Thinh Nguyen, and Bella Bose. *Cross-Domain Lossy Compression via Rate- and Classification-Constrained Optimal Transport.* International Conference on Learning Representations, 2026. **(Oral Presentation)**. [PDF]

[2] **Nam Nguyen**, Thuan Nguyen, Thinh Nguyen, and Bella Bose. *Universal Rate-Distortion-Classification Representations for Lossy Compression.* IEEE Information Theory Workshop, 2025. [PDF]

[3] **Nam Nguyen**, An Vuong, Thuan Nguyen, and Thinh Nguyen. *On Minimizing Symbol Error Probability for Antipodal Beamforming in Gaussian MIMO Wiretap Channels.* IEEE Vehicular Technology Conference, 2024. [PDF]

[4] **Nam Nguyen**, Ngoc T. Dang, and Vuong Mai. *Performance of Satellite Quantum Key Distribution under Atmospheric Turbulence-Induced Phase Fluctuations.* International Communications Satellite Systems Conference, 2023. [PDF]

[5] **Nam Nguyen**, Vuong V. Mai, and Ngoc T. Dang, *Reliability Improvement of Satellite-based Quantum Key Distribution Systems using Retransmission Scheme.* Photonic Network Communications, 2021. [PDF]

HONORS AND AWARD

- NSF iREDEFINE Fellow – ECE Department Heads Association 2026
- Signal Processing Society Scholarship – IEEE Signal Processing Society 2025
- NSF Student Travel Grant, AERPAW Spring Workshop – North Carolina State University 2025
- Graduate School's Scholarly Presentation Award – Oregon State University 2024, 2025
- Second Prize, National Scientific Research Contest – Vietnam 2020
- Second Prize in Physics, Provincial Excellent Student Competition – Vietnam 2012
- First Prize in Physics, School-Level Excellent Student Competition – Vietnam 2011, 2012, 2013