

# Nghia H. Nguyen

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## RESEARCH INTERESTS

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- **Machine Learning, Optimization, Interpretability (especially interpretable-by-design models), Algebraic Structure in LLMs**

## EDUCATION

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**University of Pennsylvania** Aug. 2023 - Present

- PhD in **Computer Science**, advised by [René Vidal](#)

**University of Science, Vietnam National University - Ho Chi Minh (VNU-HCM)** Sep. 2017 - Nov. 2021

- Bachelor of Science in **Computer Science**
- **GPA: 3.97/4.00** (Top 5/92 in the cohort).
- Thesis topic: "*Body-part Aware Network and Object Affordance Masking mechanism for Human-Object Interaction Detection.*" Supervised by [Minh-Triet Tran](#).

## SELECTED WORKS

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**Nghia Nguyen**, Tianjiao Ding, René Vidal, "Hierarchical Concept Embedding & Pursuit for Interpretable Image Classification," *Under Review, 2025*.

**Nghia Nguyen**, Darshan Thaker, Konstantinos Emmanouilidis, Tianjiao Ding, René Vidal, "SSD: Sparse Semantic Defense against Semantic Adversarial Attacks to Image Classifiers," *Under Review, 2025*.

**Nghia H. Nguyen\***, Tan M. Nguyen\*, Huyen K. Vo, Stanley Osher, Thieu N. Vo, "[Improving Neural Ordinary Differential Equations with Nesterov's Accelerated Gradient Method](#)," *Advances in Neural Information Processing Systems (NeurIPS)*, 2022. New Orleans, Louisiana, USA. \* indicates co-first authors.

Tuan-Duy H. Nguyen, **Huu-Nghia H. Nguyen**, "[Towards a Robust WiFi-based Fall Detection with Adversarial Data Augmentation](#)," *IEEE Annual Conference on Information Sciences and Systems (CISS)*, 2020. Princeton, New Jersey, USA.

## RESEARCH EXPERIENCE

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**FPT Software AI Center** Ho Chi Minh City, Vietnam  
AI Research Resident (Predoctoral Researcher) Oct. 2021 - July 2023

- Advisors: [Tan M. Nguyen](#) (UCLA, currently NUS), [Thieu N. Vo](#) (Ton Duc Thang University, currently University of Bath).
- Derived the continuous adjoint equation for the Nesterov Neural ODE, an important theoretical result for our work.
- Implemented the method and ran experiments of Nesterov Neural ODE on image classification, continuous normalizing flows, and point cloud separation.

**VinBrain** Ho Chi Minh City, Vietnam  
Applied Scientist Intern Apr. 2021 - Aug. 2021

- Supervisor: [Soan T.M. Duong](#) (University of Wollongong)
- Improved the object detection model mAP@0.5 score by over two times from a pretrained model when tested on a custom version of the Open Images v6 dataset.

**LSIR, École Polytechnique Fédérale de Lausanne** Lausanne, Switzerland (Remote from Vietnam due to COVID-19)  
Research Intern May 2020 - Oct. 2020

- Supervisor: [Chi Thang Duong](#) (EPFL)
- Worked on a Subtree-Reuse-based SQL Query Optimizer using Graph Neural Network and Box Embeddings.
- Performed experiments on the Attribute Discovery dataset to verify the plausibility of a new Multimodal Feature Fusion method using Graph Neural Networks, achieving a test accuracy of 96.86% on this dataset.

**Faculty of Information Technology, University of Science, VNU-HCM** Ho Chi Minh City, Vietnam  
Research Assistant Sep. 2019 - Aug. 2020

- Discovered the correlation between forking patterns, software health, and risks in software repositories.
- Performed inference in the Software Heritage Dataset to extract forking patterns between 50,000 repositories using PostgreSQL and Neo4J.

## ACHIEVEMENTS & AWARDS

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- Scholar Award; Advances in Neural Information Processing Systems (NeurIPS) 2022
  - Granted full registration fee and accommodation in New Orleans.
- Recommended candidate; The Vietnam Education Foundation (VEF) 2.0 Program 2022
  - Passed two interview/review rounds with leading Vietnamese academics who are Ph.D. from top U.S. graduate schools and U.S. professors.
  - The VEF 2.0 Program is conducted by the Fellows and Scholars of the Vietnam Education Foundation (VEF) – an independent U.S. Federal Government agency created by the U.S. Congress.
- Participant; Pre-PhD Summer School by VinUni-Illinois Smart Health Center, VinUniversity 2022
  - Top 50/220 applicants.
- Dean's List; Advanced Program in Computer Science, University of Science, VNU-HCM 2020, 2018
  - Top 5/92 students.
- Honorable Mention; Vietnam National Olympiad for Undergraduates in Informatics 2019
- 2<sup>nd</sup> place; The University of Science VNU-HCM Olympiad in Informatics 2019

## OTHER EXPERIENCE

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- Big-O Coding** Ho Chi Minh City, Vietnam  
Teaching Assistant, Problem Setter, Software Engineer Jul. 2018 - Dec. 2020
- Explained Algorithms and Data Structure concepts to students at Big-O Coding weekly and prepared over 20 programming problems.
  - Built version 1 of the Front-end Web Application for Big-O Coding's website to host programming problems and contests for up to 1,900 users using React JS.
  - Reduced page traversing paths for administrators by 50% by implementing a shortcut to problems.

- Pathfinder Vietnam** Ho Chi Minh City, Vietnam  
Founder, Product Team Leader, Software Engineer Sep. 2018 - May 2020
- Led product team of 6 in implementing the Minimum Viable Product using React JS and NodeJS.
  - Introduced the product's core feature by implementing the programming testing system.

## SKILLS

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- English proficiency: IELTS Academic 8.5/9.0 (Reading: 9.0, Listening: 9.0, Writing: 7.5, Speaking: 7.5).

## SIDE PROJECTS

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- What The Food app** 2018
- Implemented a Convolution Neural Network to identify 101 types of food using TensorFlow.
  - Converted the Keras model to a TensorFlow Lite model and deployed the model on an Android application using Firebase ML Kit.

## EXTRACURRICULAR ACTIVITIES

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- **Reviewer: NeurIPS, ICLR, CVPR.**
- **Volunteer: ICLR2020, ICML2021**