Nghia H. Nguyen

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RESEARCH INTERESTS

- **Machine Learning, Optimization, Differential Equations, AI4Science, Generalization**
  - How the synthesis of Deep Learning and Differential Equations can transform scientific modeling.
  - How optimization methods can increase Neural Differential Equations efficiency and capabilities.

EDUCATION

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

- Bachelor of Science in **Computer Science** - Advanced Program in Computer Science. The "Advanced Program in Computer Science" is highly selective, similar to a Bachelor with Honors program.
- **GPA: 3.97/4.00** (Top 5/92 in the cohort). The university is among the *top 2* in Vietnam in CompSci.
- Thesis topic: "*Body-part Aware Network* and *Object Affordance Masking* mechanism for *Human-Object Interaction Detection.*" Supervised by Associate Professor Minh-Triet Tran.

RESEARCH EXPERIENCE

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

- Advisors: Dr. Tan M. Nguyen (UCLA), Dr. Thieu N. Vo (FPT Software).
- 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: Dr. Soan T.M. Duong (University of Wollongong)
- Improved the object detection model mAP@0.5 score 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: Ph.D. Candidate 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 and 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.

PEER-REVIEWED PUBLICATIONS

Nghia H. Nguyen*, Tan M. Nguyen*, Huyen K. Vo, Stanley Osher, Thieu N. Vo, "[**Improving Neural Ordinary Differential Equations with Nesterov's Accelerated Gradients (Nesterov Neural ODE)**](#)," ***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**](#)," *54th IEEE Annual Conference on Information Sciences and Systems*, 2020. Princeton, New Jersey, USA.`

Tuan-Duy H. Nguyen, **Huu-Nghia H. Nguyen**, Dao Hieu, "[**Recognizing Families through Images with Pretrained Encoders**](#)," *Recognizing Families In the Wild competition, IEEE International Conference on Automatic Face and Gesture Recognition*, vol. 1, pp. 887-891, 2020. Buenos Aires, Argentina.

ACHIEVEMENTS & AWARDS

- Participant; Pre-PhD Summer School by VinUni-Illinois Smart Health Center, VinUniversity   2022
  - Top 50/220 applicants.
- Scholarship; Advanced Program in Computer Science   2020, 2018
  - Top 5/92 students.
- Honorable Mention; Vietnam National Olympiad for Undergraduates in Informatics   2019
- 2nd place; The University of Science VNU-HCM Olympiad in Informatics   2019
- Participant; Vietnam Summer School of Science (VSSS) '07   2019
  - Among 161 participants chosen from 1760 applicants nationwide.
  - 3rd prize; VSSS Science Hackathon.
- Honorable Mention; Creative Idea Contest (CIC), Information Technology Park - VNU-HCM   2019
  - Top 6/200 teams.
- Incubation; Generation Unlimited Youth Challenge by UNICEF and Saigon Innovation Hub   2018
  - Top 6/100 (equal standings) teams.

OTHER EXPERIENCE

Big-O Coding   Ho Chi Minh City, Vietnam
Teaching Assistant, Problem Setter, Software Engineer   Jul. 2018 - Dec. 2020
- Explained Algorithms and Data Structures concepts to students at Big-O Coding weekly and prepared more than 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

- Programming Languages: C++, Python, Javascript, Java, HTML, CSS, SQL.
- Frameworks and Tools: PyTorch, TensorFlow, ReactJS, Redux, Android SDK, Linux, Git.
- English proficiency: IELTS Academic **8.5/9.0** (Reading: 9.0, Listening: 9.0, Writing: 7.5, Speaking: 7.5).

SIDE PROJECTS

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

ICLR, ICML   Remote from HCMC, Vietnam
Volunteer   Apr. 2020, Apr. 2021, Aug. 2021
- Checked the websites for possible bugs and answered questions from participants.