

Huyen Thuc Khanh Vo

Ho Chi Minh, Vietnam

☎ (+84) 947 786 682

✉ vothuckhanhhuyenvn@gmail.com

📄 vothuckhanhhuyen.github.io

Research Interests

Present My research focuses on enhancing the *performance*, *efficiency*, and *robustness* of **machine learning models** and quantify *uncertainty* in the predictions that these models produce by using two core approaches: (1) **optimization methods** (momentum and adaptive optimizers); (2) **statistical methods** (conformal prediction, bayesian and probabilistic).

Education

- 2019 - 2023 **Hanoi University of Science and Technology (HUST)**, *Hanoi, Vietnam*.
- B.Sc, Major in **Computer Science** (Honors Program), CPA: 3.87 / 4.0 (Class rank: 3/35).
 - Thesis: Continuous Neural Ordinary Differential Equations [pdf] (**Best Thesis Presentation Award**). Supervised by [Dr. Linh V. Ngo](#).

Experience

- Nov 2021 - **AI Research Resident**, *FPT SOFTWARE AI CENTER*, ai.fpt-software.com.
- Present
- Advisors: [Prof. Tan M. Nguyen](#) (NUS) & [Dr. Thieu N. Vo](#) (Ton Duc Thang University).
 - Research topics: neural odes, conformal prediction and calibration, graph neural networks.
 - Proposed novel methods to improve *performance* and *efficiency* of neural odes using optimization methods (nesterov accelerated gradient (momentum optimizer), rmsprop (adaptive optimizer)).
 - Ran experiments of Nesterov Neural ODE, RMSprop Neural ODE on time series, continuous normalizing flows, image classification, and point cloud separation.
 - **Ongoing project**: Quantified uncertainty of continual learning models using conformal prediction.
 - Ran experiments on class incremental learning settings to verify that continual learning models perform poorly on old tasks in terms of confidence coverage and prediction set size.
 - Proposed a novel method based on exchangeability property to address these limitations.
- Apr 2021 - **Undergraduate Research Student**, *DATA SCIENCE LABORATORY*, ds.soict.hust.edu.vn.
- Nov 2021
- Advisors: [Dr. Linh V. Ngo](#) (HUST) & [Prof. Khoat Q. Than](#) (HUST).
 - Research topics: continual learning, probabilistic graphical models, variational inference.
 - Explored four primary approaches in continual learning, analyzed the strengths and weaknesses of each approach, made comparisons and suggested some improvements.
 - Re-implemented key algorithms from each approach.
- Jul 2021 - **Data Analyst Intern**, *VINBIGDATA*, vinbigdata.com.
- Sep 2021
- Advisors: [Dr. Tham H. Hoang](#) (University of Connecticut).
 - Examined responses to the H3N2 influenza challenge using machine learning models.
 - Dataset: GSE61754, genome-wide gene expression data from peripheral blood is taken immediately before the challenge and at 12, 24, and 48 hours post-challenge.
- Apr 2021 - **Data Science Intern**, *VIETTEL DIGITAL*, digital.viettel.vn.
- Jul 2021
- Completed courses on deep learning, computer vision, natural language processing, and big data.
 - Participated in a Kaggle contest, achieved a ranking of 108/4410 on the final private leaderboard.
 - Predicted customers' loyalty score for payment brands in Brazil [contest, solution].

Publications

- 2023 **Continuous Neural Ordinary Differential Equations.**
Huyen K. Vo*, Nghia H. Nguyen*, Long M. Bui*, Tan M. Nguyen, Stanley J. Osher, Thieu N. Vo (In preparation).
- 2022 **Improving Neural Ordinary Differential Equations with Nesterov's Accelerated Gradient Method.**
Nghia H. Nguyen*, Tan M. Nguyen*, **Huyen K. Vo**, Stanley J. Osher, Thieu N. Vo (NeurIPS: Conference on Neural Information Processing Systems, 2022, **rank A***) [pdf].
- 2022 **Development of Vietnamese Text-To-Speech for VLSP Challenge 2021.**
Le Minh Nguyen, Do Quoc An, Vu Quoc Viet, **Vo Thuc Khanh Huyen** (VNU Journal of Science: Computer Science and Communication Engineering, 2022)[pdf].

National/International Prize

- 2019 Vietnam Mathematics Olympiad (VMO), *Third prize (2019).*
- 2017 Singapore Mathematics Olympiad (SMO), *Silver medal (2017).*

Achievements

- 2023 **Second Place in FPT Software AI Center Hackathon**, *Building LLM applications.*
 - Created a travel planner app using the ChatGPT API, Google reviews API and Langchain agents to design personalized itineraries based on customers’ preferences.
- 2022 **Second Place in UET Hackathon**, *Track: Data Science*, [[contest](#), [solution](#)].
 - Predicted the income based on people’s demographic and work experience.
- 2021 **First Place in the shared task of Text To Speech, VLSP 2021**, *The 8th International Workshop on Vietnamese Language and Speech Processing*, [[contest](#), [solution](#)].
 - Developed a novel Vietnamese text-to-speech model, achieving 3.729 in-domain MOS, 3.557 out-of-domain MOS and 79.70% SUS score.
 - Proposed an effective method to preprocess a dataset that only consists of spontaneous audio, trained a FastSpeech 2 acoustic model with some replacements in the external aligner model and used HiFiGAN vocoder to construct the waveform.

Projects

- 2023 **Big Data Analysis of Binance market through Trade data and Twitter sentiment.**
 - A Big Data pipeline to aggregate Twitter data, perform users’ sentiment analysis on different cryptocurrencies and correlate findings with their market prices.
 - Implemented Lambda architecture: (1) used Binance and Twitter stream API for data extraction, preprocessed, and pushed data to Kafka topics; (2) utilized Spark for processing batch data from HDFS and Spark Streaming for real-time updates; (3) stored results in Cassandra; (4) developed a visualization platform using Flask (back-end) and ReactJS (front-end).
 - Analyzed users’ sentiment analysis using NLP techniques.

Technical Skills

- Languages Python, R, Java, C/C++, SQL.
- Frameworks PyTorch, Tensorflow, Keras, Scikit-learn.
- Big Data AWS, Spark, Hadoop, Kafka, NoSQL.
- DevOps Linux, Docker.
- Web HTML5, CSS3, JavaScript, jQuery, Ajax, Java (Servlet, Spring MVC, Spring Boot).
- Certificates Machine Learning DevOps Engineer Nanodegree program (Udacity), Data Engineering Nanodegree program (Udacity), Data Streaming (Udacity).

Languages

- Vietnamese Native.
- English IELTS Overall 7.5: Reading 8.5, Listening 8.0, Writing 6.5, Speaking 6.5.
- Others Japanese, Korean.

Extracurricular Activities

- 2023 **Vietnam Summer School of Science (VSSS) ’10**, *Participant.*
- 2022 **Pre-PhD Summer School by VinUni-Illinois Smart Health Center**, *Participant.*
- 2021 - 2022 **Student Association’s Educational Support Department, HUST**, *Member.*
- 2019 - 2021 **FPT Center for Young Talents (FYT)**, *Member.*
- 2020 **Hanoi Math Modelling**, *Content Team.*