Do Hoang Khoi Nguyen

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EDUCATION

University of Florida, Gainsville, USA

PhD. in Computer Science **October 2024-Now**

B.E. in Information System **July 2016-November 2021**

- **Current GPA:** 3.83/4.0 (Top 1%)
- **Degree Classification:** Very Good

RESEARCH INTEREST

Main Research Interests:

- Optimization Problems
- Inverse design Silicon photonics chip using Machine Learning algorithms
- *Computer vision for practical applications*
- *Reinforcement learning for Robotics and Automation*
- Time series data
- *Large Multiplex Network Influence Maximization*
- *Building Large Language Model*
- *Unsupersived Learning*

WORK EXPERIENCE

Connected Brain Corporation, Viet Nam **Feb 2023-Now**

- Research and develop models in NLP and CV related domains.
- Develop language models and machine translation for multilingual processing.
- Design a GPT ChatBot for specific domain.

Optimization Lab at University of Florida, USA **Sep 2022-Now**

- Developed reinforcement learning algorithms and probabilistic graphical models to solve the Multiplex Influence Maximization problem, which involves identifying influential nodes in a multiplex network..
- Incorporated theoretical guarantees, such as approximation bounds or convergence guarantees, to ensure the effectiveness and reliability of the proposed solutions.
- Developed deep reinforcement learning algorithms and graph neural networks to solve the Minor Embedding Problem in Quantum Computing.

Naver AI Lab, Korea (Remote) **Feb 2020-Oct 2021**

- Developed and implemented generative models, such as Variational Autoencoders (VAEs) or Generative Adversarial Networks (GANs), for unsupervised object detection tasks.
- Conducted thorough evaluation and benchmarking of generative models for unsupervised object detection, comparing their performance against state-of-the-art methods.

Intern at MobiFone Telecommunications Corporation, Viet Nam **Mar 2019-May 2019**

- Research and develop models for Liveness Detection, Fire Detection in bad condition camera.
- Design an AI device that aid human resources

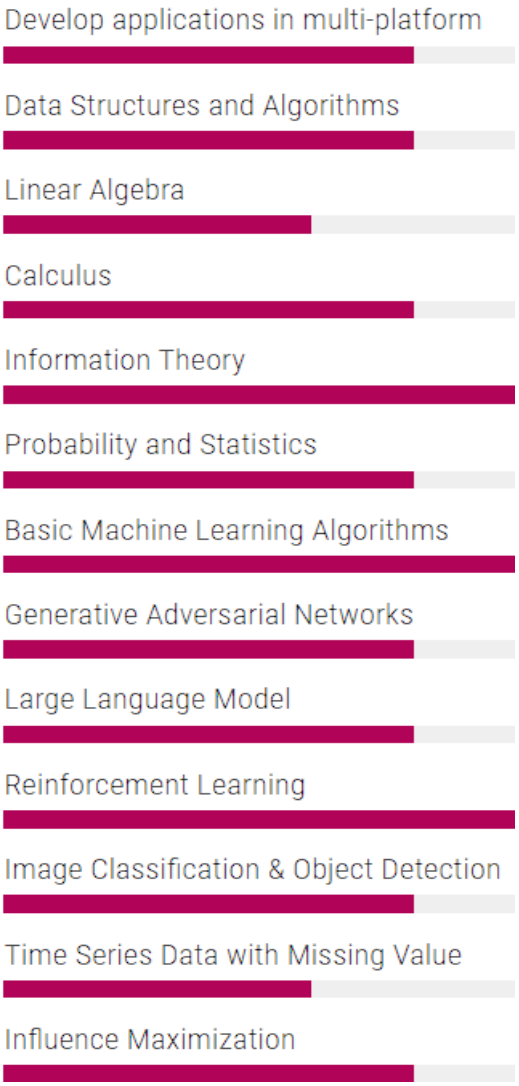
Researcher at Samsung Vietnam Mobile R&D Center (SVMC) **Aug 2018-Feb 2019**

- Build two projects related to the advanced graphic game and autonomous car.
- Research and develop novel algorithms for practical autonomous application.

AI Photonic Lab, Viet Nam **Jan 2018-Dec 2018**

- Develop photonic on chip network based on machine learning algorithms
- Simulate and organize structure data in the photonic chip
- Developed novel architectures for on-chip networks, leveraging machine learning techniques to optimize network performance and energy consumption

SKILLS



• Reinforcement Learning (RL) is my primary area of interest and one of my strongest skills. I have achieved significant accomplishments in this field, including the publication of a paper in *Nature Scientific Reports*. Additionally, I have developed a solid foundation in various areas of Computer Vision, such as Image Classification, Object Detection, and Generative Model. To enhance my knowledge and stay up to date with the latest advancements, I have dedicated considerable time to studying renowned courses from prestigious universities worldwide. I have also extensively explored papers and journals published in top-tier conferences, including the Nature family, NeurIPS, ICLR, ICML, AISTATS, AAAI, and more. Furthermore, I am proud to have recently published a paper in the *ICLR, AISTATS and AAAI conferences which are widely recognized as one of the leading conferences in the field of AI*. The paper addresses challenging problems such as Anomaly Detection and Influence Maximization using RL guided GenAI, demonstrating my comprehensive understanding and expertise in this area.

• Moving on to the skill about Time series data with missing values, I studied practical models for wearables in healthcare, In which the signals from the sensor are often noisy or missing. With the guidance from professors at my university and research center, I have greatly expanded my knowledge and have made and developed models related to this field.

• On the other hand, I have a strong background in Natural Language Processing (NLP). I possess a deep understanding of the fundamentals, including the strengths and weaknesses of renowned architecture models in NLP such as RNN, LSTM, Transformer, BERT, and GPT. Additionally, I am well-versed in the mathematical workings of these models.

• Finally, my primary programming languages are Python, C/C++, Java, Kotlin. As a Machine Learning avid, not only do I solve the problem related to ML, but also learn how to deploy them on multiple platforms.

ENGLISH PROFICIENCY LEVEL

• I have achieved a score of 7.5 on the 2024 IELTS examination. However, it is worth mentioning that my language skills have undergone significant development since obtaining this certification, primarily through my research collaborations with the AI lab at the University of Florida. These collaborations have provided me with invaluable opportunities to effectively communicate and present my ideas in English, as well as comprehend and analyze academic research papers, with a focus on Machine Learning. As a result, I am well-prepared to actively engage in academic discussions, contribute efficiently to team projects, and effectively convey my research findings to diverse audiences. My ability to comprehend and analyze intricate research papers allows me to stay abreast of the latest advancements in Machine Learning, enabling me to make meaningful contributions to the field.

PAPERS

International journal

1. N. D. H. Khoi and My T. Thai "Deductive Exploration in Deep Reinforcement Learning" **Nature Machine Intelligence** (planning to submit) **(Q1 ISI Journal)**
2. Hoang. N. Minh, N. D. H. Khoi (Co-First Author), Minh N. Vu and My T. Thai "A chain-based reinforcement learning approach for the minor embedding problem" **IEEE/ACM Transaction on Quantum Engineering** (Under revision – Minor Revision) **(Q1 ISI Journal)**
3. N. D. H. Khoi, M. Hoai, D. N. T. Hang, P.V.Cuong, C. D. Truong, " Self-Controlling Photonic-on-Chip Networks With Deep Reinforcement Learning," in **Nature Scientific Report** (Published) 2021 **(5th most-cited journal in the world**, **Q1 ISI Journal)**
4. D , "1 × 2 Switchable Dual-Mode Optical 90° Hybrid Device Based on Thermo-Optic Phase Shifters and 2 × 2 MMI Couplers on SOI Platform," in **IEEE Photonics Journal** vol. 13, no. 1, pp. 1-16, (Published) 2021 **(One of the most prestigous journal in Photonic Design field, Q1 ISI Journal)**
5. D. N. T. Hang, H. T. Duy, T. T. T. Thanh, N. D. H. Khoi and C. D. Truong, "Compact, highly efficient, and controllable simultaneous 2×2 three-mode silicon photonic switch in the continuum band," in **IEEE Access** 2021 (Published) **(Q1 ISI Journal)**

International Conference

1. **N. D. H. Khoi**, Truc Nguyen, Malik Hassanaly, raed alharbi, Jung Taek Seo, My T. Thai "Swift Hydra: Self-Reinforcing Generative Framework for Anomaly Detection with Multiple Mamba Models", **International Conference on Learning Representation (ICLR) 2025 (Top tier, A* Conference in Machine Learning) (Published)**.

2. Huyen Nguyen*, **N. D. H. Khoi***, Hieu Dam, Cong Tran, Cuong Pham, "REM: A SCALABLE REINFORCED MULTI-EXPERT FRAMEWORK FOR MULTIPLEX INFLUENCE MAXIMIZATION", **The Association for the Advancement of Artificial Intelligence (AAAI) 2025** (Published) (* Equal Contribution) **(Top tier, A* Conference in Machine Learning)**.

3. **N. D. H. Khoi**, Tanmoy Chowdhury, Chen Ling, Liang Zhao, My T. Thai, "MIM-Reasoner: Learning with Theoretical Guarantees for Multiplex Influence Maximization", **International Conference on Artificial Intelligence and Statistics (AISTATS) 2024**, Poster paper (Published) **(Top tier, A* Conference in Machine Learning)**.

4. H. T. Duy, D. N. T. Hang, T. T. T. Thanh, **N. D. H. Khoi**, C. D. Cuong, C. D. Truong, "1×2 Switchable Mode Exchange Using Controllable Phase Shifters Based on Silicon Waveguides for

High Speed Optical Interconnects", **2020 IEEE International Conference on Communications and Electronics (ICCE)**, Poster paper (Published).

5. , **N. D. H. Khoi**, H.V. Tran, P.V.Cuong, C. D. Truong "Multi-Objective Exploration for Proximal Policy Optimization", **2020 IEEE Applying New Technology in Green Building (AtiGb), Oral paper** (**Best paper award**) (Published).

RESEARCH PROJECT

Controllable silicon-photonic network-on-chip via AI (VINIF.2019.DA12)

Aug 2019-Sep 2021

The project is funded by VINIF Foundation-Vingroup Group

Position/Role in the project: Member

Responsibility:

- Design and optimize Silicon photonics
- Build multicast switches and controllable on-chip networks
- Develop and deploy new algorithm for the controllable chip.

Design of optical gate logic gates based on Silicon photonic crystals

Jan 2020-Sep 2020

The project is funded Posts and Telecommunications Institute of Technology

Responsibility: research assistant

HONORS AND AWARDS

• First prize in the innovation and entrepreneurship competition of the Posts and Telecommunications Institute of Technology (2023)
• Best paper award at international conference IEEE ATiGB (2021).
• Excellent quality in Science Research Award of Technology in Post and Telecommunication Institute of Technology: Smart control via speech recognition using Time-Series Data Model (2020)
• Excellent quality in Science Research Award of Technology in Post and Telecommunication Insitute of Technology: DeepNet for smart routing and optimize based on Reinforcement Learning (2020)
• Rank 8/400 (students) in ACM ICPC contest (2019)
• BK Aptech Certification: Professional Mobile Developer on Android (2018)
• Second prize in Olympic Math for high school student in Ha Noi, Viet Nam (2015)

ACTIVITIES

• In 2020, I volunteered at a school to support a fundraising event dedicated to upland children. This event aimed to raise funds and resources to provide educational opportunities for children in mountainous areas who may not have the means to attend school. In the event, I contributed to creating awareness and generating support for these children's education.

• Additionally, I have consistently participated in annual charity campaigns focused on assisting families in need, with a particular emphasis on mountainous regions. These campaigns aim to address the educational barriers faced by children in these areas, ensuring they have access to quality education. By actively engaging in these initiatives, I have had the opportunity to make a positive impact on the lives of these families and empower them through education.

REFERENCES

1. Professor My T Thai

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2. Professor Minh Hoai Nguyen

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Bio Sketch

Link 1: https://vnexpress.net/tag/do-hoang-khoi-nguyen-1482819

Link 2: https://giaoducthoidai.vn/giao-duc/chang-sinh-vien-tre-tu-choi-luong-khung-de-theo-duoi-chip-quang-tu-Y4T1awbnR.html

Link 3: https://www.nguonluc.com.vn/sinh-vien-viet-nam-co-cong-bo-quoc-te-ve-tri-tue-nhan-tao-a1675.html

Link 4: https://www.tincongnghe.net/t-54224/sinh-vien-nghien-cuu-ai-co-cong-bo-quoc-te.html