Quoc Chuong Nguyen

Curriculum Vitae

Address	: Ho Chi Minh City, Vietnam
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Google Scholar	: https://scholar.google.com/citations?user=embX1-gAAAAJ&hl=en
GitHub	: https://github.com/ChuongQuoc1413017

Research Interest

Mathematics	: Game Theory · Network Science · Category Theory
Computer Science	: Complexity Theory · Reinforcement Learning
Quantum Computation	: Quantum Algorithm · Quantum Artificial Intelligence

Education & Training

Education

2023 - 2025 **Master of Arts in Mathematics at SUNY, University at Buffalo (State University of New York at Buffalo)**, New York City, the US
Track: Applied Mathematics
CGPA: 3.889/4.0 and **Degree GPA**: 3.967/4.0 (Grade A/A-: High Distinction)
Conferral Date: June 1, 2025

2014 - 2018 **Bachelor of Science in Physics at University of Science (HCMUS) Vietnam National University, Ho Chi Minh City (VNU-HCM)**, Vietnam
Track: Theoretical Physics
CGPA: 8.27/10 or 3.5/4.0 (top 2% over 300 students)
Graduated Seminar: Simulation of Quantum Many-body Dynamics using the Monte-Carlo algorithm with Python (Non-Thesis option)

Publication

Published

- **Quoc Chuong Nguyen** et al. "FQsun: A Configurable Wave Function-Based Quantum Emulator for Power-Efficient Quantum Simulations", IEEE Access, vol. 13, pp. 93271-93286, 2025.
- **Quoc Chuong Nguyen** et al. "Qsun: an open-source platform towards practical quantum machine learning applications", Machine Learning: Science and Technology, vol. 3, pp. 015034, 2022.

Preprint

- Quoc Chuong Nguyen. "Network Sampling: An Overview and Comparative Analysis", arXiv:2504.17701, 2025.
- **Quoc Chuong Nguyen** et al. "Hybridising Reinforcement Learning and Heuristics for Hierarchical Directed Arc Routing Problems", arXiv:2501.00852, 2025.
- Quoc Chuong Nguyen. "Monte Carlo Analysis of Boid Simulations with Obstacles: A Physics-Based Perspective", arXiv:2412.10420, 2024

- **Quoc Chuong Nguyen** and Trung Kien Le. "Toward a comprehensive simulation framework for hypergraphs: a Python-base approach", arXiv:2401.03917, 2024.

Academic Experience

Recent Remote Collaborations

- May 2024 - Now: In collaboration with Prof. Hy Truong Son (University of Alabama at Birmingham, US) and Prof. Thu Huong Dang (Lancaster University, England)
  - Combinatorial Optimization, Operation Research: Solving the Hierarchical Directed Capacitated Arc Routing Problem with heuristic algorithms

Software

- QSun: Quantum platform to simulate quantum circuits using NumPy array
  - https://github.com/ChuongQuoc1413017/Quantum_Virtual_Machine
- Quantum Evolutionary Algorithm: Optimize quantum circuits' structure using Evolutionary Algorithms
  - https://github.com/ChuongQuoc1413017/Quantum_Evolutionary_Algorithm
- HyperRD: Simulation and analysis of random and dynamical hypergraph
  - https://github.com/ChuongQuoc1413017/Hypergraph_RD

Lecture Notes

- Summary of Lie Algebra in Particle Physics (Vietnamese)
  - https://github.com/ChuongQuoc1413017/Note/blob/main/Lie%20Algebra.pdf
- Quantum Machine Learning at $\langle$QCS | 2021$\rangle$
  - https://github.com/ChuongQuoc1413017/Note/blob/main/QML_Lecture_Note.pdf

Research Positions

Institute of Fundamental & Applied Sciences, Duy Tan University — July 2025 - Now
Website: https://ifas.duytan.edu.vn/
Position: Researcher
Job Description: develop quantum machine learning models and quantum algorithms

QuantumLab - Ho Chi Minh City Institute of Physics, Vietnam — Sep 2021 - May 2022
Website: https://lantrann.github.io/QuantumLab-HCMIP
Position: Affiliated Member
Job Description: develop quantum machine learning applications in chemistry and quantum metrology

Research Assistant for Dr. Hung Q. Nguyen, Vietnam — Nov 2019 - Apr 2023
Position: Research Assistant
Job Description: develop Qsun (Quantum Computing simulator, Python) and Variational Quantum Eigensolver's applications in machine learning

Teaching

Mentor of Directed Reading Project program at SUNY, UB — Jan 2024 - May 2024
Description: teach undergrad students about Computational Thinking and Data Structures & Algorithms

Teaching Assistant (TA) at SUNY, UB — Aug 2023 - May 2025
Description: TA in Calculus, Linear Algebra, and Stochastic Processes

Talks/Posters at Conferences, Workshops, and Schools

"Introduction to Quantum Algorithms" — 22 Nov 2025
at Quantum Winter School, HCMUT, Vietnam — Lecturer

"Quantum Machine Learning & Qsun platform" — 13 Oct - 15 Oct 2025
at PIPC 2025: Celebrating 100 years of quantum physics, Vietnam — Poster

"Quantum Machine Learning" — 19 Aug 2025
at Quantum Computing Seminar, Vietnam — Speaker

"Quantum Machine Learning" — 04 Dec - 12 Dec 2021
at Quantum Computing School - $\langle$QCS | 2021$\rangle$, Vietnam — Contributory Lecturer

"Half-wormhole solutions & Black Hole singularity" — 13 Oct 2021
at The 46th Vietnam Conference on Theoretical Physics (VCTP-46) — Poster

Honors & Awards

Tuition & Teaching Assistantship (SUNY, University at Buffalo) — Aug 2023 - June 2025
Description: for Master/Ph.D. student with a good profile — 2 academic years

Academic incentive scholarships (University of Science, HCMUS) — Nov 2014 - Nov 2018
Description: for students with the highest GPA and contributions to extracurricular activities for society each semester. — 8 academic semeters

Conferences, Workshops, and Schools Attended

VIASM-ICTP Summer School in Group Theory and Representation Theory	9 - 21 Aug 2022
The Mathematics of Interactive Bose Gas 2022	1 - 6 Aug 2022
Topological Quantum Electrons Interacting In-persons	10 - 16 July 2022
Spring School on Superstring Theory and Related Topics	9 - 13 May 2022
The 10th International Workshop on Solid-State Quantum Computing	29 Nov - 1 Dec 2021
The 2021 Vietnam Operations Research Network Meeting	26 - 27 Nov 2021
Vietnam School on Neutrinos - VSON2021	29 Aug - 09 Sep 2021
Vietnam - USA Joint Mathematical Meeting - VNUS 2019	10 - 13 Jun 2019
Asia-Europe-Pacific School of High-Energy Physics, Vietnam	12 - 25 Sep 2018

Working Experience

Education

FUNiX Co. Ltd., Vietnam — Jul 2020 - Nov 2021
Position: Collaborative Assistant
Job Description: develop machine learning & data science courses, translate courses' contents from Vietnamese to English, fix coding bugs

Saigon Scientists Co., Vietnam — Jul 2018 - Jul 2019
Position: Research & Development Assistant
Job Description: develop STEM lessons, translate courses' contents from Vietnamese to English, project management

Languages & Computer Skills

Vietnamese:	Mother tongue
English:	Intermediate
Programming languages:	Proficient: Python, NetworkX, Qiskit, Pennylane Basic: Mathematica, Matlab, R, LaTeX, Haskell, Lean

Certifications

- GRE General Test: 317/340 (75th percentile)
  - Quant: 167/170 (87th percentile), Verbal: 150/170, AW: 3.5/6.0
- Introduction to Discrete Mathematics for Computer Science Specialization (offered by University of California San Diego) on *Mathematical Thinking, Probability, Combinatorics, and Graph Theory* at Coursera in 2022, Credential ID: ZDLRFFSJ6H8N.
- Introduction to Logic and Critical Thinking Specialization (offered by Duke University) on *Argument Analysis, Deductive Reasoning, Inductive Reasoning, and Fallacies* at Coursera in 2022, Credential ID: PNT6RQ3G9Q89.
- Mind and Machine Specialization (offered by University of Colorado Boulder) on *Cognitive Science and Artificial Intelligence* at Coursera in 2022, Credential ID: HNTZFNDS4LU7.
- Writing in the Sciences (offered by Stanford University) at Coursera in 2022, Graded 100/100 with Honors, Credential ID: HTJ5EJQ2VZ2F.
- Game Theory (offered by Stanford University and The University of British Columbia) at Coursera in 2022, Graded 100/100, Credential ID: SUFX9JZ2YTSA.
- Research Writing in the Sciences course at INASP, the United Kingdom (International Network for Advancing Science and Policy) in 2022, Graded Merit.
- Machine Learning courses on *Regression, Classification, and Clustering* at FUNiX, Vietnam (an online learning platform for Vietnamese) in 2020, Graded 10/10.
- ERASMUS+ course on *Symmetry and Invariance in Physics* (a short course about symmetries and Noether's theorem taught by Prof. Amaury Mouchet from François Rabelais University, France, and organized at HCMUS) in 2016, Non-Graded.

Referee for Peer-Reviewed Journals

- Quantum Machine Intelligence
- Scientific Reports

References

Prof. Thu Huong Dang (Google Scholar)
Department of Management Science
Lancaster University, England
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Prof. Long Tran-Thanh (Google Scholar)
Department of Computer Science
University of Warwick, England
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Dr. Hung Q. Nguyen (Google Scholar)
Nano and Energy Center
University of Science, VNU Hanoi, Vietnam
Email: hungngq@hus.edu.vn

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Prof. Le Ho (Google Scholar)
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Tohoku University, Japan
Email: binho@fris.tohoku.ac.jp

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