Quoc Chuong Nguyen

Curriculum Vitae

Address	: Buffalo City, New York, the US
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Google Scholar	: https://scholar.google.com/citations?user=_ExA7HUAAAAJ&hl=en
GitHub	: https://github.com/ChuongQuoc1413017
Website	: https://sites.google.com/view/quocchuong

Research Interest

Mathematics	: Graph Theory · Model Theory · Proof Theory · Group Theory
Computer Science	: Complexity Theory · Model of Computation · Quantum Algorithm
Physics	: Quantum Information · Quantum Artificial Intelligence

Education & Training

Education

2023 - now **Ph.D student at University at Buffalo**, New York City, the US
Major: Mathematics
Advisor: Prof. Naoki Masuda

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

Publication

- **Quoc Chuong Nguyen** et al. "Qsun: an open-source platform towards practical quantum machine learning applications", Machine Learning: Science and Technology, 2022 (Q1 journal, Impact Factor › 6)

Training

- GRE General Test: 317/340 (75th percentile)
  - Quantitative Reasoning: 167/170 (87th percentile)
  - Verbal Reasoning: 150/170
  - Analytical Writing: 3.5/6.0
- 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.

Research Experience

Remote Collaborations

- Mar 2022 - Apr 2023: In collaboration with Dr. Hung Nguyen (Vietnam National University, Hanoi, Vietnam), Dr. Le Ho (Tohoku University, Japan), and Kien Le (University of California, Santa Barbara, the USA)
  - Quantum Computing, Quantum Measurement: Squeezing circuit and comparison between classical and quantum Fisher information
- Jul 2021 - Dec 2021: In collaboration with Loc Tran (Department of Applied Mathematics and Theoretical Physics, University of Cambridge, the United Kingdom) and Le Duc Truyen (The Institute For Interdisciplinary Research in Science and Education, Quy Nhon, Vietnam)
  - Random Network, Quantum Complexity: Sachdev-Ye-Kitaev (SYK) model & Jackiw-Teitelboim (JT) gravity: Half-wormhole saddles & related topics (resulted in a poster)
- Nov 2019 - Mar 2022: In collaboration with Dr. Hung Nguyen (Vietnam National University, Hanoi, Vietnam), Dr. Lan Tran (Ho Chi Minh City Institute of Physics, Vietnam), and Dr. Le Ho (Tohoku University, Japan)
  - Programming Language, Machine Learning, Quantum Platform: Resulted in a publication and quantum simulator platform Qsun

Software

- HyperRD: Simulation and analysis of random and dynamical hypergraph
  - https://github.com/ChuongQuoc1413017/Hypergraph_RD
- 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

Lecture Notes

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

Talks/Posters at Conferences, Workshops, and Schools

"Quantum Machine Learning" — 04 Dec - 12 Dec 2021
at Quantum Computing School - ⟨QCS | 2021⟩, 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

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 times

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

Research

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 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

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 (IELTS Band Score 6.5): L: 6.0 - R: 8.0 - W: 6.0 - S: 5.5
Programming languages:	Proficient: Python, NetworkX, Qiskit, Pennylane Basic: Mathematica, Matlab, R, LaTeX, Haskell, Lean

Certifications

- 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.

Referee for Peer-Reviewed Journals

- Quantum Machine Intelligence
- Scientific Reports

Selective Interests

- Books, Puzzles, Kalimba (instrument), Chinese chess

References

Prof. Naoki Masuda (Google Scholar)
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University at Buffalo, US
Email: naokimas@gmail.com

Prof. Long Tran-Thanh (Google Scholar)
Human-Agent Learning (HAL) lab
University of Warwick, England
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