

# Quoc Chuong NGUYEN

## CURRICULUM VITAE

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## RESEARCH INTEREST

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**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

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### 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

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- 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

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### 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 analyze random and dynamical hypergraph
  - [https://github.com/ChuongQuoc1413017/Hypergraph\\_RD](https://github.com/ChuongQuoc1413017/Hypergraph_RD)
- Quantum Platform: Quantum simulation using NumPy array
  - [https://github.com/ChuongQuoc1413017/Quantum\\_Virtual\\_Machine](https://github.com/ChuongQuoc1413017/Quantum_Virtual_Machine)
- Genetic Algorithm, Quantum Computing: Optimize quantum circuits' structure using Evolutionary Algorithms
  - [https://github.com/ChuongQuoc1413017/Quantum\\_Evolutionary\\_Algorithm](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  $\langle \text{QCS} \mid 2021 \rangle$ 
  - [https://github.com/ChuongQuoc1413017/Note/blob/main/QML\\_Lecture\\_Note.pdf](https://github.com/ChuongQuoc1413017/Note/blob/main/QML_Lecture_Note.pdf)

### TALKS/POSTERS AT CONFERENCES, WORKSHOPS, AND SCHOOLS

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<a href="#">"Quantum Machine Learning"</a> at Quantum Computing School - $\langle \text{QCS} \mid 2021 \rangle$ , Vietnam	04 Dec - 12 Dec 2021 <a href="#">Contributory Lecturer</a>
<a href="#">"Half-wormhole solutions &amp; Black Hole singularity"</a> at The 46th Vietnam Conference on Theoretical Physics (VCTP-46)	13 Oct 2021 <a href="#">Poster</a>

## HONORS & AWARDS

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**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

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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

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### 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

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VIETNAMESE:	Mother tongue
ENGLISH:	Intermediate ( <a href="#">IELTS Band Score 6.5</a> ): 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

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- [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: ZDL-RFFSJ6H8N.
- [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

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- [Quantum Machine Intelligence](#)
- [Scientific Reports](#)

## SELECTIVE INTERESTS

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

## REFERENCES

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

Prof. Long Tran-Thanh ([Google Scholar](#))  
Human-Agent Learning (HAL) lab  
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