

PERSONAL PROFILE

Fullname: Vu Tuan Hai

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EDUCATION

- **Master of computer science**, University of Information Technology (UIT), VNU-HCM: 2/2022 – 6/2023.
Current GPA: 8.86/10. Thesis: Dynamic quantum neural network (9.3/10)
- **Bachelor of software engineering**, University of Information Technology (UIT), VNU-HCM: 9/2017 – 5/2021. GPA: 8.58/10. Thesis: Reconstructed teeth image from braces with GAN (9.4/10).
- **English**: TOEIC Certificate 635/990 and VNU-EPT 225/400.

EXPERIENCES

Part-time teaching assistant 3/2019 – 12/2021,
UIT, VNU-HCM Vietnam

- Teaching assistant in “Data structures & algorithm” subject: 3 – 6/2019
- Teaching assistant in “Object oriented – programming” subject: 3 – 7/2020
- Teaching assistant in “Introduce to software engineering and Database” subjects: 9 – 12/2021.

Research member 3/2019 – now,
IC-IP Lab, Saigon University Vietnam

- Joining deep learning projects
- Supervise new members

Software engineer 9/2020 – 12/2020,
TMA Solutions Vietnam

- Develop communication platforms using WebRTC and Angular.

Research member 10/2021 – now,
Quantum Group, VNU-HCM Vietnam

- Joining quantum computing projects
- Writing proposal
- Supervise new members

Formal teaching assistant

12/2021 – now,

Faculty of Software Engineering, UIT, VNU-HCM

Vietnam

- Teaching assistant in “Object-oriented programming” and some software engineering specialized subjects.
- Researching about machine learning: applied deep learning model to process sequence dataset.
- Researching about quantum computing: quantum gradient, quantum tomography, quantum state preparation and making a package for quantum compilation model.
- Researching about cryptography: quantum protocol, post-quantum cryptography.

PROJECTS

- Genetic algorithm for quantum architecture search, **Vu Tuan Hai**, Nguyen Tan Viet, Le Bin Ho (8/2023 – now).
- AKQ: A hybrid quantum - classical image encryption system, **Vu Tuan Hai** (1/2023 – now). Grant. No. D1-2023-48.
- Variational preparation of entangled states on quantum computers, **Vu Tuan Hai**, Nguyen Tan Viet, Le Bin Ho (1/2023 – now). <https://arxiv.org/abs/2306.17422>.
- Dynamic quantum neural network, **Vu Tuan Hai**, (12/2022 – 6/2023), Grant. No. D1-2023-03.
- Hybrid quantum – classical quantum KNN, **Vu Tuan Hai**, (8/2021 – 8/2022), Grant. No. D1-2022-08.

SKILLS

- **Programming languages:** Python, C++, C#, Java.
- **Frameworks:** Qiskit, Numpy, Tensorflow, Pytorch, .NET, Java Spring.
- **Tools:** Git, VSCode, Overleaf, Maple.
- **Teaching**

ACTIVITY & AWARD

- **Pony Chung scholarship for Master student**, Pony Chung Foundation, 2023
- **Best poster award at ASEM2022, Vanlang University:** 4/2022.
- **Encourage scholarships**, UIT, VNU-HCM: 2/2018 – 4/2021 (for bachelor degree) and 2023 (for master degree).
- **Certificate of Merit from the President of VNU-HCM:** 8/2021.
- **Valedictorian in Software engineering program**, UIT, VNU-HCM: 4/2021.
- **Member of the studying board, Faculty of Software Engineering**, UIT, VNU-HCM (help students in academics): 10/2018 – now.

PUBLICATIONS

Journal:

- **Vu Tuan Hai** and Ho, Le Bin, "Universal compilation for quantum state tomography", Scientific Reports 13.1 (2023): 3750.
- **Hai, Vu Tuan**, and Phan Hoang Chuong. "New approach of KNN Algorithm in quantum computing based on new design of quantum circuits." Informatica 46, no. 5 (2022).
- **Hai, Vu Tuan**, Dang Thanh Vu, Huynh Ho Thi Mong Trinh, and Pham The Bao. "Reconstructed teeth image from braces with GAN." Biomedical Engineering: Applications, Basis and Communications 33, no. 06 (2021): 2150043.

Oral presentation:

- Tran Khanh Nguyen and **Vu Tuan Hai**, "AKQ: A hybrid quantum-classical image encryption system", 2023 RIVF International Conference on Computing and Communication Technologies.
- Ho, Le Bin and **Vu Tuan Hai**, "Lagrange interpolation approach for parameter-shift rule of general quantum gates", 2022 International Symposium on Quantum Computing: Circuits Systems Automation and Applications.
- Pham The Bao, Nguyen Thi Tuyet Nam, **Vu Tuan Hai**, "Prediction of PM2.5 concentrations in Ho Chi Minh city, Vietnam using univariate time series models", The 12th Asian Aerosol Conference (AAC).

Poster presentation:

- Tran Khanh Nguyen, **Vu Tuan Hai**, "Applying CRYSTALS-Kyber in the post-quantum image encryption scheme", UIT Young Scientists & Fellows Conference 2023.
- **Vu Tuan Hai**, "GA-QAS: a genetic-based architecture search for quantum compilation", UIT Young Scientists & Fellows Conference 2023.
- **Vu Tuan Hai**, Pham The Bao, "Entangled topologies for quantum evolutionary neural networks in quantum image processing", 2023 The 12th International Symposium on Information and Communication Technology.
- **Vu Tuan Hai**, Le Bin Ho, "Quantum compilation for quantum state tomography", ASEM 2022, Vanlang University.
- **Vu Tuan Hai**, "Can quantum natural gradient better than Adam in quantum optimization?", UIT Young Scientists & Fellows Conference 2022.
- **Vu Tuan Hai**, "Optimization on black-box function by parameter-shift rule", UIT Young Scientists & Fellows Conference 2022.
- **Vu Tuan Hai**, Phan Hoang Chuong, "Fast computation the fidelity between two states by using a new design of quantum circuits", UIT Young Scientists & Fellows Conference 2021.

Book:

- Hai, V.T., Ho, L.B. (2024). Lagrange Interpolation Approach for General Parameter-Shift Rule. In: Thapliyal, H., Humble, T. (eds) Quantum Computing. Springer, Cham. https://doi.org/10.1007/978-3-031-37966-6_1

- Phan Hoang Chuong, **Vu Tuan Hai** et al, “Introduce to quantum computer”, Ho Chi Minh City National University Publishing House, 2022.