

Po-Wei (George) HUANG

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EDUCATION

National University of Singapore

Aug 2020 - Jun 2023

Bachelor of Computing (Computer Science) with Honours (Highest Distinction) (GPA 4.81/5.00)

- Second Major in Mathematics
- Turing Programme ([Honours Research Specialization Program](#))
- Study Focus Area: Algorithm and Theory / Artificial Intelligence

Nanyang Technological University

Aug 2019 - May 2020

Computing and Business Undergraduate Student (GPA 4.91/5.00(CS) 4.74/5.00(BUSINESS))

- Incomplete; transferred to NUS by end of freshman year

RESEARCH EXPERIENCE

Research Assistant (Quantum Algorithms)

May 2023 - Present

Principal Investigator: Asst. Prof. Patrick Rebentrost (CENTRE FOR QUANTUM TECHNOLOGIES)

- Investigating hybrid quantum-classical algorithms for quantum machine learning with provable convergence.
- Exploring fault-tolerant quantum algorithms for optimization problems with a provable speedup.

Bachelor's Dissertation

Aug 2022 - Apr 2023

Supervisor: Asst. Prof. Patrick Rebentrost, Prof. Rahul Jain (CENTRE FOR QUANTUM TECHNOLOGIES)

- Proposed “post-variational” strategies that convert quantum optimization to convex optimization problems.
- Proposed different heuristics for selecting Ansätze for problem-agnostic post-variational neural networks.
- Conducted error analysis of such strategies and provided upper bounds of quantum measurements required.

Undergraduate Research Opportunities Programme

Apr 2021 - Jul 2022

Supervisor: Assoc. Prof. Min-Yen Kan (WEB IR/NLP GROUP @ NUS)

- Optimized document structure extraction performance by 10% for marco-F1 against a previous model.
- Adapted sliding attention framework to induce quadratic speedup in runtime for transformer autoencoders.
- Applied data augmentation for semi-supervised training to increase model robustness to out-of-domain data.

Student Researcher

Sep 2018 - May 2019

Supervisor: Prof. Hong-Ping Lin (NCKU CHEMISTRY)

- Synthesized porous bio-carbon by carbonizing pyrolysis oil mixtures as an alternate material for supercapacitors.
- Experimented on the effect of micropores and mesopores on the capacitance and resistance via cyclic voltammetry.

PREPRINTS AND MANUSCRIPTS

P.-W. Huang, X. Li, K. Koor, P. Rebentrost (2023). [Hybrid quantum-classical and quantum-inspired classical algorithms for solving banded circulant linear systems](#). *arXiv:2309.11451 [quant-ph]*

P.-W. Huang, P. Rebentrost (2023). [Post-variational quantum neural networks](#). *arXiv:2307.10560 [quant-ph]*

PEER-REVIEWED PUBLICATIONS

P.-W. Huang (2022). [Domain specific augmentations as low cost teachers for large students](#). In *Proceedings of the First Workshop on Information Extraction from Scientific Publications*, pages 84–90, Online. Association for Computational Linguistics.

P.-W. Huang, A. Ramesh Kashyap, Y. Qin, Y. Yang, and M.-Y. Kan (2022). [Lightweight contextual logical structure recovery](#). In *Proceedings of the Third Workshop on Scholarly Document Processing*, pages 37–48, Gyeongju, Republic of Korea. Association for Computational Linguistics.

TALKS AND POSTERS

“Hybrid quantum-classical and quantum-inspired classical algorithms for solving banded circulant linear systems.” *Poster presentation at QIP 2024.* (Jan 15, 2024)
“Post-variational quantum neural networks.” *Contributed talk at QTML 2023.* (Nov 22, 2023)
“Post-variational strategies for quantum machine learning.” *QML Seminar, QAISG.* (Oct 24, 2023)
“Post-variational quantum neural networks.” *CS Seminar, Centre for Quantum Technologies.* (Aug 30, 2023)
“Domain specific augmentations as low cost teachers for large students.” *Contributed talk at First Workshop on Information Extraction from Scientific Publications @ AACL-IJCNLP.* (Nov 21, 2022)
“Lightweight contextual logical structure recovery.” *Poster presentation at Third Workshop for Scientific Document Processing @ COLING* (Oct 17, 2022)

ACHIEVEMENTS AND AWARDS

Degree Honours – Highest Distinction (2023)
Certificate of Distinction – Algorithms & Theory / Artificial Intelligence (2023)
SoC Take on the World Award x2 (Funding for participation for international events) (2023)
Top Students for Design and Analysis of Algorithms / Optimisation Algorithms (2022, 2023)
Dean’s List (Fall 2020, Spring 2021, Fall 2022)
Honour List of Student Tutors (2022)

TEACHING EXPERIENCE

NUS School of Computing Jan 2021 - Apr 2023
Teaching Assistant (DATA STRUCTURES AND ALGORITHMS)

- Provided algorithm design consultation and pseudocode fine-tuning for 120+ students over 6 semesters.
- Graded programming assignments for 200+ students over 7 semesters.
- Designed lab materials for Java programming and data structure applications.

INDUSTRIAL EXPERIENCE

Continental Automotive Singapore May 2022 - Jul 2022
Software Engineer Intern (CENTRAL ENGINEERING DEPARTMENT)

- Developed an internal tool to track coding issues with the purpose of reducing manual time.
- Designed heuristic-based algorithm for string matching for issue detection.

Taiwan Semiconductor Manufacturing Company (TSMC) Jul 2021 - Sep 2021
Information Technology Intern (EQUIPMENT EDGE COMPUTING TEAM)

- Facilitated database transfer from SQL to NoSQL increasing read/write access speed by 10x.
- Deployed Kubernetes hosted Cassandra database with Spring backend access and Prometheus monitor system.

ACADEMIC SERVICES

Reviewer for Int. J. Quantum Information
Sub-reviewer for QTML 2023, QIP 2024, TAMC 2024, Advanced Quantum Technologies

EXTRACURRICULAR ACTIVITIES

NUS Investment Society Sep 2020 - Jun 2021
Quantitative Engineer (QUANTITATIVE FINANCE TEAM)

- Conducted analysis on quantitative personal portfolio optimization with mulit-factored regression.

NUS Students for the Exploration and Development Society Oct 2020 - May 2021
Science Development Engineer (MARS ROVER TEAM)

- Designed drill system and sensor integration for Mars rover prototype.

SKILLS

Spoken Languages: English (full professional proficiency), Chinese (native)
Programming Languages: C/C++, Java, Python
Quantum Computing: Qiskit, PennyLane