Po-Wei (George) HUANG

+65 8891 3219 | huangpowei22@u.nus.edu | huangpowei | georgepwhuang | georgepwhuang.github.io

EDUCATION

National University of Singapore **Aug 2020 - Jun 2023 (Exp.)**

BComp (Hons.) in Computer Science with Second Major in Mathematics (CAP 4.82/5.00)

- Expected graduation with First Class Honours.
- Turing Programme (Honours Research Specialization Programs)
- Study Focus Area: Algorithm and Theory / Artificial Intelligence
- Coursework: Design and Analysis of Algorithms (A^+), Information Theory (A^+), Optimization Algorithms (A^+), Randomized Algorithms (A), Algorithm Mechanism Design (A), CS Research Methodology (A^-), Artificial Intelligence (A), Machine Learning (A^-), Quantum Computing (A^-), Quantum Mechanics II (A)

Nanyang Technological University **Aug 2019 - May 2020**

BEng/BBus Double Degree in Business and Computing (CAP 4.91/5.00(CS) 4.74/5.00(Business))

- Coursework: Computational Thinking (A^+), Data Structures(A^+), Data Science and AI (A^+)

RESEARCH EXPERIENCE

Hybrid Classical-Quantum Neural Networks **Aug 2022 - Present**

Supervisor: Asst. Prof. Patrick Rebentrost, Professor Rahul Jain (Centre for Quantum Technologies)

- Proposed and designed "post-variational" regression and multilayer perceptron models for quantum neurons.
- Analyzed and optimized quantum error propagation and amplifications for both online and offline algorithms.
- Proposed randomized approximation algorithm to construct hybrid neural networks that minimize dependencies on quantum devices while achieving similar results.

Neural Logical Structure Recovery in Scholarly Articles **Apr 2021 - Jul 2022**

Supervisor: Assoc. Prof. Min-Yen Kan (NUS Web IR/NLP Group)

- Optimized logical structure recovery model performance by 10% for Marco-F1 against a state-of-the-art model.
- Adapted sliding attention framework reducing computation cost from $O(n^2)$ to $O(n)$.
- Applied deep semi-supervised learning techniques to increase model robustness to out-of-domain data.

Synthesis of Bio-Carbon and its Applications on Electric Components **Aug 2018 - May 2019**

Supervisor: Professor Hung-Ping Lin (National Cheng-Kung University)

- Trial tested porous bio-carbon synthesis process to replace graphene-based electric double-layer capacitors.
- Developed Arduino-controlled capacitance measurement system for super-capacitors.

PUBLICATIONS

Po-Wei Huang (2022). Domain Specific Augmentations as Low Cost Teachers for Large Students. *Proceedings of the First Workshop on Information Extraction from Scientific Publications (WIESP@AACL-IJCNLP2022).*

Po-Wei Huang, Abhinav Ramesh Kashyap, Yanxia Qin, Yajing Yang, and Min-Yen Kan (2022). Lightweight Contextual Logical Structure Recovery. *Proceedings of the Third Workshop on Scholarly Document Processing (SDP@COLING2022).*

Christian James Welly, Han Jiatong, **Huang Po-Wei**, and Nguyen Chi Hai (2022). Survey on Minimum K-Cut Via Edge Contraction. *(Preprint)*

ACHIEVEMENTS AND AWARDS

Certificate of Distinction for Algorithms & Theory Focus Area **Jan 2023**

Top Students for Design and Analysis of Algorithms/Optimisation Algorithms **Jan 2023**

Dean's List, AY 2020/2021 Sem 1 & Sem 2, AY 2022/2023 Semester 1 **Dec 2022**

Honour List of Student Tutors AY 2021/2022 **Dec 2022**

TEACHING EXPERIENCE

NUS School of Computing **Jan 2021 - Present**

Teaching Assistant (Data Structures and Algorithms)

- Provided algorithm design consultation and pseudocode fine-tuning for 150+ students over 7 terms.
- Designed lab materials for Java programming and data structure applications.
- Wrote automatic student code collector for easier plagiarism detection and grading.

WORK EXPERIENCE

OpenRead **Mar 2022 - Sep 2022**

NLP Engineer (Java, Python, PyTorch)

- Constructed an inference engine for table and figure extraction using vision models from scientific articles.
- Developed document reconstruction program for PDF files using multimodal ensemble neural networks.
- Assembled summarization pipeline for long scholarly documents.

Continental Automotive Singapore **May 2022 - Jul 2022**

Software Engineer Intern (Python, SQL, Batch Scripting)

- 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.
- Participated in Agile ceremonies and familiarized Agile workflows.

Taiwan Semiconductor Manufacturing Company (TSMC) **Jul 2021 - Sep 2021**

IT Intern (Equipment Edge Computing Team) (Java, Kubernetes, NoSQL)

- Facilitated database transfer from SQL to NoSQL increasing read/write access speed by 10x.
- Created Spring-based backend of the existing dashboard to streamline database accessing procedures.
- Deployed cluster-balanced Cassandra database, reducing reliance on external data services.
- Adapted Prometheus and Grafana interface for easy monitoring of Kubernetes cluster health status.

PROJECTS

KattisGrader [Python]

- Generates student reports on assignment completion and plagiarism detections for faster assignment grading.
- Filters student submissions for submission to MOSS for further more fine-grained plagiarism checks.

Optimized Logical Structure Extraction Network [Python]

- Provided easy-to-access pre-trained deep learning models for logical structure extraction.
- Developed logical structure recovery machine learning pipeline for production usage.

TSMCTalkTalk Discussion Board *(Hosted Sample App)* [HTML, Python, Django]

- Built a Django-based discussion forum to simulate technical exchanges.
- Designed and implemented discussion thread anonymity and archival functionality.
- Utilized Docker technology for rapid deployment to the in-house Kubernetes platform ensuring data privacy.

Link.me *(Project Repo)* [Java, JavaFX]

- Built client contact information and meeting schedule management platform with notification features.
- Designed graphic user interface with compatibility for feature expansion.

SKILLS

Spoken Languages: English (professional working proficiency), Chinese (native)
Programming Languages: C/C++, Java, Python
Database Management: Cassandra, JDBC, MySQL, NoSQL, PostgreSQL, SQLAlchemy, SQLite
Data Science: Matplotlib, NumPy, Pandas, SciPy, Seaborn
Machine/Deep Learning: HuggingFace, Jupyter, Keras, NLTK, PyTorch, Scikit-Learn, SpaCy, Tensorboard
Software Engineering: Gradle, Maven, Spring
Cloud/Edge Computing: Docker, Grafana, Kubernetes, OpenShift, Prometheus
Project Management: Azure, Git, GitHub, Jenkins, Jira
Quantum Computing: Pennylane, Qiskit
Miscellaneous: Arduino, BeautifulSoup, Django, LaTeX, Linux/Unix, Tableau