Philip Lee Hann Yung

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EDUCATION

Nanyang Technological University (NTU) Aug 2019 – Jun 2023
- **Bachelor of Engineering (Electrical and Electronic Engineering)**
- **Honours (Highest Distinction)** (Expected); current CGPA: 4.94 / 5.00
- Specialization: **Info-Communication Engineering (Data Intelligence and Processing)**
- Relevant Modules: (1) *Artificial Intelligence and Data Mining* (2) *Probability Theory and Applications* (3) *Database Systems* (4) *Data Structures and Algorithms* (5) *Computer Vision and Pattern Recognition* (6) *Digital Signal Processing* (7) *DSP System Design* (8) *Computer Communications* (9) *Microprocessors*

Virtual Training, Learning and Development
- Coursera Relevant Specializations (3-5 Courses Each): (1) *Applied Data Science with Python* (2) *Deep Learning* (3) *PostgreSQL for Everybody* (4) *Natural Language Processing* (5) *TensorFlow: Data and Deployment* (6) *Web Applications for Everybody* (7) *Digital Signal Processing* (8) *Generative Adversarial Networks*

AWARDS / RECOGNITION

- **2* Dean's List Awardees** (2019, 2020)
- **NTU Class of 1985 Scholarship Recipient** (2022)
- **Student Leadership Development Programme: Emergent Leadership** (2020)
- **NTU President Research Scholar (with Merit)**, Undergraduate Research Experience on CAmpus (URECA) (2020)
- **Champion**, Carro x AWS Hackathon (2022)
- **1 Published Conference Paper** as First Author (2022)

INTERNSHIP & WORK EXPERIENCE

NTU Nanyang Business School, *Research Assistant (Data Science)* May 2022 – Jan 2023
- Designed ***Python*** *web scraping* scripts to extract textual content from 5 websites using *Selenium*. Conceptualised *ELT pipeline* for *indexing, archiving, field extraction, and data cleaning* to build high-quality, structured datasets.
- Interfaced with Twitter API to build *large-scale geo-tagged datasets* (4 mil tweets) with *ETL pipeline*. Developed *NLP-based geolocation models* with composite feature engineering to predict user locations based on tweet features.
- Utilized ***JavaScript*** and *Google Earth Engine* to aggregate biodiversity data on specific regions from public datasets. Conducted *geospatial data analysis* and generated visualizations using ***Python***, ***R***, *geopandas, and matplotlib*.

Panasonic R&D Center Singapore, *Deep Learning Algorithm Engineering Intern* Jan 2022 – Jun 2022
- Conceptualised robust computer vision prototype using ***Python***, *OpenCV* and *PyTorch* for *real-time end-to-end* social distancing and mask detection on network camera and *low-power 15-watt Jetson* device.
- Investigated and trained 3 *light-weight* AI submodules, optimising for *computation speed* while maintaining *good accuracy*. Built and containerized system as *Docker* image for *system reusability and deployment*.
- Utilised and trained *Generative Adversarial Networks (GANs)* for *image-to-image translation* tasks to augment existing image datasets to different domain, *reducing model bias* in *semantic segmentation* and other tasks.

Energy Research Institute @ NTU, *Software Engineer (Backend, IoT) Intern* May 2021 – Oct 2021
- Adapted multiple services and technologies (NGINX, ***PostgreSQL***, MQTT, and ***Python***) as the project stack on *Linux-based system*. Setup services on workstation server and integrated various sub-modules for team members.
- Designed and implemented *database logic design*; incorporated dashboard app components using ***ReactJS***.
- Refined and debugged software, including creating ***Python*** automated scripts to capture and process real-time stream data from Bluetooth Gateways and IP Cameras.

ACADEMIC PROJECTS / HACKATHONS

NTU Final Year Project: ***Driver Action Recognition using Artificial Intelligence*** Aug 2022 – May 2023
- Reviewed, trained, and benchmarked 3 *video action recognition model* families using *PyTorch and* ***Python*** on publicly available dataset, with dual focus on *accuracy and efficiency*.
- Investigated improvements for robust recognition like *class weighting*, *hard sample mining* and *proposed multi-modal fusion architectures* (RGB, Infrared, Depth), resulting in a 13% balanced accuracy score increase.
- Constructed dataset for driver behaviour monitoring, subsequently designing and deploying 30 FPS real-time system prototype for *real-world scenarios* within physical car cabin environment, after fine-tuning on self-collected data.

Carro x AWS Hackathon 2022: *License Plate Extraction* (**Champion**, **Team Leader** of 5) Mar 2022
- Developed *license plate extraction pipeline* integrating SOTA *text detection* and *text recognition* models.
- Proposed pre-processing techniques involving *automatic horizontal image alignment* and *mean shift clustering* for text filtering and sorting. Employed *ensemble* methods to achieve an *edit distance score of 0.9422 within 48 hours*.

NTU Design and Innovation Project (**Team Leader** of 5)
Smart Touchless Control with Credit-Card Sized Radar Sensor and Microcomputer Aug 2021 – Nov 2021
- Published conference paper as first author in *2022 IEEE 11th Global Conference on Consumer Electronics (GCCE)*.
- Developed real-time touchless human-machine interface using *Radar Signal Processing* (e.g., Magnitude, STFT, MFCC) and *ensembling* techniques with *Deep Neural Networks*, using 60 GHz radar sensor and *Raspberry Pi* microcomputer.
- Demonstrated use case of prototype for menu ordering using *gesture recognition* with ***Python*** *GUI Menu*.

Shopee Ultra-Hackathon 2021: *Try-it-on* (**Top 10 Finalist out of 400 teams**; Team of 4) Jan 2021
- Interfaced with Shopee's API to download images for accessory attachment on faces in *Augmented Reality*.
- Adapted and trained *Convolutional Neural Networks* in *Keras* and ***Python***, while utilising *OpenCV's Haar Cascades* to perform facial detection and keypoint localisation *within 36 hours*.

NTU-EEE Module: ***Introduction to Data Science and Artificial Intelligence***
Module Project: ***Fraudulent Job Postings Sentiment Analysis*** (**Team Leader** of 4) Oct 2020 – Nov 2020
- Researched and conceptualized *Natural Language Processing (NLP) pipeline* using ***Python*** (e.g., textual data pre-processing, useful features extraction, TF-IDF transformation for sentiment analysis).
- Supervised *Exploratory Data Analysis* executed by teammate with data perspective provisioning; acquired insights into successful identification of special features associated with fraudulent postings.
- Successfully modified, trained, and tuned *6 Binary-Classification Models (*e.g., Logistic Regression, Keras) that incorporated *oversampling* and *class weighting* techniques to *increase F2 score* of models by *6%*.

NTU Garage@EEE: ***Unity Game "Scarlet Mansion" in Enitio 2020*** (Team of 4) Jun 2020 – Jul 2020
- Designed and developed *3D Detective Game* for Freshmen Orientation Programme that attracted 300 participants, utilizing *Unity and* ***C#*** to create engaging and immersive gaming experience.

LEADERSHIP / CO-CURRICULAR ACTIVITIES

EEE Graduates' Event Committee, *Chairperson* Nov 2022 – **Present**
- Led committee to *develop and execute comprehensive plan* for successful graduation event, including creating detailed timelines, budgets, and checklists to ensure all macro details were covered.
- Provide guidance and support throughout event planning and execution, offering constructive feedback, and recognizing members' contributions and achievements.

MLDA@EEE (Machine Learning & Data Analytics), *Academic & Training Subcommittee* Aug 2020 – May 2023
- Designed and delivered engaging workshop materials to *over 300 participants*, aimed at enhancing students' understanding and conceptualization of the topic. Demonstrated excellent communication and presentation skills, resulting in *high levels of participant engagement and positive feedback*.
- Workshops conducted: (1) Introduction to Data Science & Artificial Intelligence (2) Linear & Logistic Regression (3) Edge Machine Learning (4) Amazon SageMaker

NTU Electrical and Electronic Engineering Club, *Student Development Director* Sep 2020 – Aug 2021
- Directed 10-member committee in successfully implementing 4 planned projects, including consolidating alumni questionnaires for use in the Industrial Interviews for EEE and IEM students.
- Negotiated contract agreement to digitalize past year paper solutions, while maintaining positive relationships with existing stakeholders, *resulting in improved accessibility and efficiency* for students. Subsequently designed and launched PYP website (**HTML**, **CSS** and **JavaScript** based), attracting *55k visitors in two years*.

SKILLS

- **Languages**: Fluent in English and Malay, Moderate proficiency in Chinese (Mandarin)
- **Software Programming**: Python, SQL, R, MATLAB, C, C++, C#, Assembly, HTML, JavaScript, CSS, PHP, Markdown
- **Software Applications**: Docker, Tableau, MS Office (Word, Excel, PowerPoint), Unity, Google Earth Engine
- **Frameworks & Libraries**: PyTorch, TensorFlow, Keras, Pandas, NumPy, OpenCV, Scikit-learn, Matplotlib, Plotly, Regex, Selenium, HuggingFace, NTLK, Geopandas, Shapely, Scikit-image, ggplot2, dplyr
- **Dev Environment**: Linux, AWS, GCP, Git, Multi-CUDA/GPU, cuDNN, NGINX, SSH, Raspberry Pi, Arduino