Philip Lee Hann Yung

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Portfolio Website: https://leephilipx.github.io/^ | **Availability:** From July 2023 (Full-time)

EDUCATION

Nanyang Technological University (NTU) *Aug 2019 – **Jun 2023*** (Expected)

- **Bachelor of Engineering (Electrical and Electronic Engineering)**
- **Honours (Highest Distinction)** (Expected); current CGPA: 4.94 / 5.00
- **Specialization**: Info-communication Engineering (Data Intelligence & Processing)
- **Dean's List** (2019, 2020); **NTU Class of 1985 Scholarship** (2022)
- **Student Leadership Development Programme: Emergent Leadership** (2020)
- **NTU President Research Scholar**: Undergraduate Research Experience on CAmpus (URECA) (2020)
- **Relevant Modules**: *(1) Artificial Intelligence & Data Mining (2) Database Systems (6) Data Structures and Algorithms (3) Computer Vision and Pattern Recognition (4) Digital Signal Processing (5) DSP System Design (7) Computer Communications (8) Microprocessors (9) Probability Theory and Applications*

Virtual Training and Learning 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^*

WORK EXPERIENCE / INTERNSHIP

Nanyang Business School, NTU^ – *Data Scientist (Part-Time)* *May 2022 – Jan 2023*

- Designed *Python web scraping* scripts to extract textual content from 5 websites using *Selenium*. Conceptualised an *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* with an *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*.
- Demonstrated strong skills and *exceptional adaptability* to various project requirements.

Panasonic R&D Center Singapore^ – *Deep Learning Algorithm Engineering Intern* *Jan 2022 – Jun 2022*

- Conceptualised a robust computer vision prototype involving 3 *light-weight* AI submodules involving *person detection, facial detection and key-point regression*, *image classification*, *tracking*, and *homography* techniques for a *real-time end-to-end* social distancing and mask detection system on a *Jetson* platform (edge device).
- Built *Docker* images for *module reusability*, optimising for *computation speed* while maintaining *good accuracy*.
- Utilised *Generative Adversarial Networks (GANs)* for *image-to-image translation* tasks to augment existing image datasets to a 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, including *NGINX*, *PostgreSQL*, *MQTT*, *ReactJS* and *Python,* as the project stack on a *Linux-based system*. Integrated various sub-modules and applications for team members.
- Devised the main *database logic design* and web app components, including data handling from *PostgREST API*.
- 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 – **Present***

- Review and benchmark 3 *video action recognition model* families using *PyTorch and Python* on a publicly available dataset, with a dual focus on *accuracy and efficiency*. Improvements like class weighting, hard sample mining and *multi-modal fusion (RGB, Infrared, Depth)* for robust recognition will also be investigated.
- Construct a dataset for driver behaviour monitoring, subsequently designing and deploying a prototype for a *real-world, real-time scenario* within a 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 a *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*.

^ contain embedded links

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 a real-time touchless human-machine interface using *Radar Signal Processing* (eg. *Magnitude, STFT, MFCC*) and *ensembling* techniques with *Deep Neural Networks*, using a tiny 60 GHz radar sensor and a small *Raspberry Pi* microcomputer.
- Demonstrated a use case of the prototype for menu ordering using *gesture recognition* with a *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 utilised *OpenCV's Haar Cascades* to perform facial detection and keypoint localisation *within a short time period of 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 a *Natural Language Processing (NLP) pipeline* in the project (e.g. *textual data pre-processing, useful features extraction, and 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%*.

Garage@EEE: ***Unity Game "Scarlet Mansion" in Enitio 2020***^ (Team of 4) *Jun 2020 – Jul 2020*

- Designed and developed a *3D Detective Game* for a Freshmen Orientation Programme that attracted 300 participants, utilizing *Unity and C#* to create an engaging and immersive gaming experience.

LEADERSHIP / CO-CURRICULAR ACTIVITIES

EEE Graduates' Event Committee - *Chairperson* *Nov 2022 – **Present***

- Led a committee to *develop and execute a comprehensive plan* for a successful graduation event, including creating detailed timelines, budgets, and checklists to ensure all macro details were covered.
- Provide guidance and support throughout the planning and execution of the event, offering constructive feedback, and recognizing members' contributions and achievements.

MLDA@EEE (Machine Learning & Data Analytics) – *Academic & Training Subcommittee* *Aug 2020 – **Present***

- 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 (Academics)* *Sep 2020 – Aug 2021*

- Directed a 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 a contract agreement to digitalize past year paper solutions, while maintaining positive relationships with existing stakeholders, *resulting in improved accessibility and efficiency for students*.

AWARDS

- Carro x AWS Hackathon 2022: Champion
- Dean's List in NTU School of Electrical and Electronic Engineering: AY2020-21, AY2019-20
- NTU Class of 1985 Scholarship
- Top in the World Award for Cambridge International A-Levels – Further Mathematics

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, Tableu, ReactJS, 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

^ contain embedded links