

Koay Hong Vin

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Education

- 2020 – **Ph.D., Universiti Malaya, Malaysia** in Engineering and Engineering Trades.
Proposed Thesis Title: *Vision-based Driver Distraction Detection using Machine Learning*
Supervisor: *Assoc Prof Ir Dr Chuah Joon Huang, Assoc Prof Ir Dr Chow Chee Onn*
- 2022 – 2023 **Visiting Student, Tsinghua University, China**
I attend postgraduate courses related to statistical inference and AI chip design.
- 2016 – 2020 **B.Eng Electrical Engineering, Universiti Malaya, Malaysia**
Thesis title: *Kalman Filtering in Battery Management System for Lithium-Ion Battery Packs: Simulation and Hardware Implementation*
Industrial Design Project: *Traffic Prediction using Machine Learning*
CGPA: 3.97/4.00 *Pass with Honours with Distinction*
Awards: *Prof Gray Gold Medal Award, University Book Prize, Students' Icon Award, Excellence Student Awards*
- 2015 – 2016 **Malaysian Matriculation, Kedah Matriculation College, Malaysia**
CGPA: 4.00/4.00

Research Experiences

- 2022 **Research Collaborator**, NICS Lab, Tsinghua University.
Collaborated on producing efficient 3D object detection.
- 2019 – 2020 **Research Intern**, MIMOS Berhad, Malaysia
Working with the Microelectronics Department in developing a battery management system to be used in electric buses.
Proposed a hybrid CCM-EKF SOC estimation algorithm and flashed into STM32 Nucleo board. The algorithm achieve srefresh rate of 1Hz and accuracy of 99%.
- 2018 – 2019 **Research Collaborator**, TrafficSens, Malaysia.
Collaborated with TrafficSens in completing the project “Traffic Prediction using Machine Learning”.
The project has won the best project among 26 teams in Department of Electrical Engineering, Faculty of Engineering, Universiti Malaya.
- 2017 – 2018 **Research Assistant**, Motorola Solutions, Malaysia.
Assisted in several IoT-based projects and web development for environment monitoring.

Research Publications

Journal Articles

- 1 **H. V. Koay**, J. H. Chuah, C.-O. Chow, and Y.-L. Chang, “Detecting and recognizing driver distraction through various data modality using machine learning: A review, recent advances, simplified framework and open challenges (2014–2021),” *Engineering Applications of Artificial Intelligence*, vol. 115, p. 105 309, 2022.
- 2 **H. V. Koay**, J. H. Chuah, C.-O. Chow, Y.-L. Chang, and B. Rudrusamy, “Optimally-weighted image-pose approach (OWIPA) for distracted driver detection and classification,” *Sensors*, vol. 21, no. 14, p. 4837, 2021.
- 3 **H. V. Koay**, J. H. Chuah, C.-O. Chow, Y.-L. Chang, and K. K. Yong, “YOLO-RTUAV: Towards real-time vehicle detection through aerial images with low-cost edge devices,” *Remote Sensing*, vol. 13, no. 21, p. 4196, 2021.

Conference Proceedings

- 1 **H. V. Koay**, J. H. Chuah, and C.-O. Chow, "Convolutional neural network or Vision Transformer? Benchmarking various machine learning models for distracted driver detection," in *TENCON 2021-2021 IEEE Region 10 Conference (TENCON)*, IEEE, 2021, pp. 417–422.
- 2 **H. V. Koay**, J. H. Chuah, and C.-O. Chow, "Shifted-window hierarchical Vision Transformer for distracted driver detection," in *2021 IEEE Region 10 Symposium (TENSymp)*, IEEE, 2021, pp. 1–7.
- 3 **H. V. Koay**, J. H. Chuah, and K. Y. Tan, "A hybrid kalman filtering for state of charge estimation of lithium-ion battery used in low-powered microcontroller: Ccm-ekf approach," in *2020 IEEE 8th Conference on Systems, Process and Control (ICSPC)*, IEEE, 2020, pp. 25–30.

Teaching Experiences

- 2020 – 2021
- 📌 **Teaching Assistant** for Engineering Mathematics 1
Undergraduate level engineering mathematics 1 for freshman year. Tutorial materials available at <https://2021.kix1001.hongvin.xyz/>
 - 📌 **Teaching Assistant** for Engineering Economics Analysis
Undergraduate level engineering economics analysis.
- 2021 – 2022
- 📌 **Teaching Assistant** for Engineering Mathematics 2
Undergraduate level engineering mathematics 2 for freshman year. Tutorial materials available at <https://2022.kix1002.hongvin.xyz/>

Other Experiences

- 2019
- 📌 **Android Developer**, Sichuan Suge Communication Technology Co. Ltd, China
Assisted the team in optimizing custom Launcher for vendor. Worked with Android Open Source Project and Launcher3.
- 2018
- 📌 **Internship**, Telekom Malaysia.
Worked with several departments, including Access Network Delivery (AND), Core Network & Facility Delivery (CNFD), Business Function and Financial Management (BFFM), Fulfillment and assurance of network and various ITNT related departments.
- 2019 – 2020
- 📌 **Research Intern**, MIMOS Berhad, Malaysia
Working with the Microelectronics Department in developing a battery management system to be used in electric buses.
Proposed a hybrid CCM-EKF SOC estimation algorithm and flashed into STM32 Nucleo board. The algorithm achieve srefresh rate of 1Hz and accuracy of 99%.

Services

- 2022
- 📌 **Peer Reviewer**, IEEE ITS, T&F Cybernetics and Systems.
- 2021
- 📌 **Volunteer**, ICML 2021.
- 2017
- 📌 **Facilitator**, Freshman Orientation of Universiti Malaya
- 2016
- 📌 **Facilitator**, Freshman Orientation of Kedah Matriculation College

Services (continued)

Leadership Roles

- 2018 – 2020 ■ **President & Co-Founder** of Malaya Electrical Student Association.
Co-founded an association for electrical engineering undergraduate student. Periodically organizing talks and visits for all students.
- 2018 – 2019 ■ **President** of IEEE Universiti Malaya Student Branch.
- 2017 – 2018 ■ **President** of BEGIN Challenge.
A STEM-related competition for secondary school student.
- 2018 ■ **Head of Sponsorship** of TEDxUniversityofMalaya 2018.
- 2018 ■ **Head of Sponsorship** of EDMAT-39.
- 2017 ■ **Head of Publicity** of 22nd Grand Asian Chess Challenge.
- 2017 ■ **Vice President** of IUM Challenge.
Organized a national inter-varsity hackathon.

Honors and Awards

Awards

- 2020 ■ **Best FYP Winner of IEEE Malaysia FYP Competition** (Signal Processing Track)
- 2020 ■ **Head of Department Award and IEEE EPS Malaysia Chapter Award** for FYP project, Department of Electrical Engineering, Faculty of Engineering, Universiti Malaya
- 2020 ■ **Prof Gray Gold Medal**, Universiti Malaya
- 2020 ■ **University Book Prize**, Universiti Malaya
- 2019 ■ **Excellence Student Awards**, Faculty of Engineering, Universiti Malaya
- 2019 ■ **Best IDP project and Best Video** for IDP project, Department of Electrical Engineering, Faculty of Engineering, Universiti Malaya
- 2018 ■ **Students' Icon Award**, Universiti Malaya
- 2017 ■ **Best Leadership Award**, Second Residential College, Universiti Malaya

Competition-Related Awards

- 2023 ■ **Consolation** of RHB Get Your Hack Out ASEAN 2023 Virtual Hackathon
- 2022 ■ **Champion** of Malaysia Techlympics 2022 (AI Tracks)
- 2022 ■ **Second Runner-Up** of Shanghai Jiao Tong University Summer Camp Hackathon
- 2021 ■ **Champion** of DSC Kita Hack
- 2021 ■ **Second Runner-Up** of Penang Fintech Digital Hackathon
- 2019 ■ **Champion** of AVIATAR Hackathon.
- 2019 ■ **Champion** of AGTech Hackathon Champion
- 2018 ■ **Second Runner-Up** of Samsung Global Startup Acceleration Program
- 2017 ■ **Champion** of GIG Economy Hackathon


Certification

- 2020 ■ **Huawei HCNA.**


Scholarships


- 2016-2020 ■ Yayasan Telekom Malaysia Future Leaders Scholarship


Honors and Awards (continued)


2022  ASEAN-China Young Leaders Scholarship

Skills


Languages  Strong reading, writing and speaking competencies for English, Mandarin, Bahasa Malaysia.


Programming  Python, MATLAB, R, C, C++, \LaTeX


Web Dev  Nginx Web Server, React


Framework  Pytorch, NumPy, SciPy, Pandas

Invited Talks

2022  Invited talk on *Introduction to Deep Learning* for international engineering camp (EDMAT).

 Invited talk on *Tips and Tricks of Winning a Hackathon* for Universiti Putra Malaysia Google Developer Student Club.

2021  Invited talk on *Artificial Intelligence in Health Science* for AUA-Universiti Malaya Overseas Study Program 2021.

 Invited talk on *Quick Data Visualization Hands-on with COVID-19 data* for MESA.