Kok Yew NG (Mark NG), PhD

Senior Lecturer (Associate Professor) and Head of Multi-Agent Robotics Centre,
School of Engineering, Ulster University, UK

Vice-Chair, IEEE UK and Ireland Control Systems Chapter

EPSRC ILN+ Researcher in Residence, Digital Catapult

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Brief Biography

I received the BEng (Hons) in Electrical and Computer Systems Engineering and the Ph.D. in Fault Diagnosis and Control Systems from Monash University in 2006 and 2009, respectively. I am currently a Senior Lecturer (Associate Professor) in Mechatronics Engineering and Control at the School of Engineering, Ulster University, UK, and I am attached to the Engineering Research Institute.

My research interests include fault diagnosis, mathematical modelling, digital twin, and data analytics for anomaly detection and classification.

In 2014–2015, I was a postdoctoral researcher at the Division of Vehicular Systems, Linköping University, Sweden, where I worked with Volvo Car Corporation (VCC) on advanced fault diagnosis schemes in vehicular engines using model-based and data-driven methods. For this research, I was instrumental in developing a Digital Twin/Simulation Testbed on the MATLAB/Simulink platform for realistic simulation and testing of residuals generation and fault diagnosis methods for the following:

- Realistic modelling and control of the engine Injection and simulation of a variety of actuator, sensor, and variable faults in the engine
- In-house designed algorithm for additional residuals selection
- In-house designed algorithm for alarm generations, residuals monitoring, as well as Fault Isolation (FI)
- Simulation and FI of system with intermittent residuals

This research work was published in the *IEEE Control Systems Magazine* (click here) and the Digital Twin/Simulation Testbed can be downloaded via the main hosting site (click here) or its mirror at Linköping University (click here).

Throughout my career, I have secured more than £6.5 million in research grants from various funders such as the Engineering and Physical Sciences Research Council (EPSRC), UK Research and Innovation (UKRI), Global Challenges Research Fund (GCRF), and the Northern Ireland Department for the Economy in the UK; the Fundamental Research Grant Scheme (FRGS), Exploratory Research Grant Scheme (ERGS), and EScienceFund from the Ministry of Higher Education in Malaysia; and industries such as Volvo Car Corporation in Gothenburg, Sweden.

Overall, I have successfully supervised no less than 2 postdoctorals, 8 PhD, and 3 Master's by Research candidates.

I am also currently attached to the Digital Catapult as an awardee of the EPSRC Innovation Launchpad Network+ (ILN+) Researcher in Residence Scheme. This research project aims to develop an energy mapping Digital Twin technology that contributes towards net zero in wind turbine energy. This technology encompasses the entire energy lifecycle, from mining through storage to utilisation in Northern Ireland (NI). This project also involves collaboration with the Offshore Renewable Energy Catapult.

Other highlights include being a co-investigator in SAFEWATER (click here), a £5 million project funded by UKRI-GCRF, where I led the development and the optimisation of embedded algorithms to control low-cost water disinfection technologies used in the rural areas in South America.

In addition, during the COVID-19 pandemic, I led the Modelling and Forecast Task Force at Ulster (click here) where we worked with the Southern Health and Social Care Trust to provide analysis to the Government Specialist Modelling Response Expert Group (SMREG) in Northern Ireland. The main purpose of the project was to validate and inform the SMREG as well as help governing bodies in Northern Ireland to better plan for intervention measures and ultimately flatten the curve. I was also a member of the COVID-19 Task Force set up by the IEEE Region 8 community. In addition, I led a team of researchers and data scientists from Ulster and Queen's University Belfast to work with the Incident Controller for the State Health Incident Control Centre and Deputy Chief Health Officer of the Department of Health in Western Australia to model the outbreak of COVID-19 on commercial cargo vessels.

I am a Senior Member of the IEEE and I am currently the Vice-Chair of the IEEE Control Systems Society (CSS), UK and Ireland Chapter.

I am the Moderator for the *IEEE TechRxiv*, the Associate Editor for *IEEE Access*, and the Editor for *PeerJ Computer Science*.

I am also an Adjunct Senior Research Fellow with Monash University Malaysia where I served as a Lecturer from 2009, and subsequently as Senior Lecturer till 2017.

Education

2006 Monash University, BEng (Hons) Electrical and Computer Systems Engineering
2009 Monash University, PhD (Control Engineering and Fault Diagnosis)
Thesis: *Advancements in Robust Fault Reconstruction Using Sliding Mode Observers*

Experience

Ulster University
- 2021–present Senior Lecturer (Associate Professor), Mechatronics Engineering and Control Systems
- 2017–2021 Lecturer, Mechatronics Engineering and Control Systems

Linköping University, Sweden
- 2016 Visiting Researcher (with Volvo Cars) (3 months)
- 2014–2015 Postdoctoral Fellow, Division of Vehicular Systems (with Volvo Cars)

Monash University, Malaysia
- 2017–present Adjunct Senior Research Fellow
- 2016–2017 Senior Lecturer, Electrical and Computer Systems Engineering
- 2009–2016 Lecturer, Electrical and Computer Systems Engineering
- 2006–2009 Graduate Researcher and Teaching Assistant

Honours and Awards

2024 Nomination for Learning and Teaching Award, Ulster University Students' Union
2020 Learning and Teaching Award, Ulster University Students' Union
2018 Erasmus+ Staff Mobility Program
2012 Monash University Malaysia PVC's Award for Excellence in Research, Round 1
2012 Letter of Commendation for Excellence Unit Evaluation Result from the Associate-Dean (Education), Faculty of Engineering, Monash University Australia
2011 Monash University Malaysia PVC's Award for Excellence in Teaching, Round 2
2011 Monash University Malaysia PVC's Award for Excellence in Teaching, Round 1
2010 Top 50 Best Units offered by Faculty of Engineering, Monash University Across All Campuses (ranked #22)
2010 Monash University Malaysia PVC's Award for Excellence in Teaching, Round 2
2010 Monash University Malaysia PVC's Award for Excellence in Teaching, Round 1
2009 Monash University Malaysia PVC's Award for Excellence in Teaching, Round 2
2007 Degree by Research Scholarship for Ph.D. in Engineering
2006 Postgraduate Research Scholarship for Master of Engineering Science by Research
2002 Monash University Malaysia Entrance Scholarship

Professional Memberships

IEEE
- 2024–present Vice-Chair, IEEE UK and Ireland Control Systems Chapter
- 2022–2024 Secretary, IEEE UK and Ireland Control Systems Chapter
- 2020–present Senior Member, IEEE
- 2010–2011 Auditor, IEEE Robotics and Automation Society (RAS) Malaysia Chapter
- 2009–2019 Member, IEEE

2018–present Fellow, Higher Education Academy UK
2005–present Graduate Member, Board of Engineers Malaysia (BEM)

Committees

2024–present Technology Strategy Groups Member (Digital Factory), Advanced Manufacturing Innovation Centre (AMIC), NI
2024–present Steering Member, Northern Ireland High Performance Computing (NI-HPC)
2023–present Athena Swan Champion, School of Engineering
2011 Faculty Representative, Campus Review Panel for Higher Degree by Research Course

Research Leadership and Activities

2024–present Multi-Agent Robotics Centre (MARC) for Control, Digital Twin, and Advanced Manufacturing
Lab Head and Ulster Lead at School of Engineering, Ulster University

2021–present Control Systems, Fault Diagnosis Schemes, Data Analytics Using ML and DL for IIoT and Industry 4.0 Applications
Ulster Lead, collab. with Technical University of Applied Sciences Augsburg and Technology Transfer Center for Flexible Automation in Nördlingen, Germany

2020–2022 Modelling and Predicting the Health Impact and Duration of SARS-CoV-2 Outbreaks on Board Cargo Vessels
Ulster Lead, collab. with Deputy Chief Health Officer of the Western Australia Department of Health

2020–2022 COVID-19 Modelling and Forecast Task Force
Ulster Lead, collab. with NI Government Specialist Modelling Response Expert Group (SMREG)

2019–present Identification and Classification of Multiple Weed Rice Species Using Mobile Computing
Ulster Lead, collab. with Monash University, Malaysia

2015–2018 Mobile Control of Intelligent Lighting Systems
Monash Lead, collab. with ItraMAS Corporation Malaysia

Publications: Preprint Articles

[1] S. Wucherer, R. McMurray, **K. Y. Ng**, and F. Kerber, *Learning to Predict Grip Quality from Simulation: Establishing a Digital Twin to Generate Simulated Data for a Grip Stability Metric*, 2023. arXiv: 2302.03504. [Online]. Available: https://arxiv.org/abs/2302.03504.

Publications: Peer-Reviewed Journal Articles

[1] T. Fairooz, S. E. McNamee, D. Finlay, **K. Y. Ng**, and J. McLaughlin, "Enhancing Sensitivity of Point-of-Care Thyroid Diagnosis via Computational Analysis of Lateral Flow Assay Images Using Novel Textural Features and Hybrid-AI Models," *Biosensors*, vol. 14, no. 12, 2024. DOI: 10.3390/bios14120611.

[2] O. Escalona, N. Cullen, I. Weli, N. McCallan, **K. Y. Ng**, and D. Finlay, "Robust arm impedocardiography signal quality enhancement using recursive signal averaging and multi-stage wavelet denoising methods for long-term cardiac contractility monitoring armbands," *Sensors*, vol. 23, no. 13, p. 5892, 2023. DOI: 10.3390/s23135892.

[3] T. Fairooz, S. E. McNamee, D. Finlay, **K. Y. Ng**, and J. McLaughlin, "A novel patches-selection method for the classification of point-of-care biosensing lateral flow assays with cardiac biomarkers," *Biosensors and Bioelectronics*, vol. 223, p. 115 016, 2023. DOI: 10.1016/j.bios.2022.115016.

[4] N. McCallan, S. Davidson, **K. Y. Ng**, P. Biglarbeigi, D. Finlay, B. L. Lan, and J. McLaughlin, "Epileptic multi-seizure type classification using electroencephalogram signals from the Temple University Hospital Seizure Corpus: A review," *Expert Systems with Applications*, p. 121 040, 2023. DOI: 10.1016/j.eswa.2023.121040.

[5] **K.Y. Ng**, T. A. Codreanu, M. M. Gui, P. Biglarbeigi, D. Finlay, and J. McLaughlin, "Development of a mathematical model to predict the health impact and duration of SARS-CoV-2 outbreaks on board cargo vessels," *WMU Journal of Maritime Affairs*, 2022. DOI: 10.1007/s13437-022-00291-1.

[6] P. Biglarbeigi, **K. Y. Ng**, D. Finlay, R. Bond, M. Jing, and J. McLaughlin, "Sensitivity analysis of the infection transmissibility in the UK during the COVID-19 pandemic," *PeerJ*, vol. 9, e10992, 2021. DOI: 10.7717/peerj.10992.

[7] T. D. Do, M. M. Gui, and **K. Y. Ng**, "Assessing the effects of time-dependent restrictions and control actions to flatten the curve of COVID-19 in Kazakhstan," *PeerJ*, vol. 9, e10806, 2021. DOI: 10.7717/peerj.10806.

[8] M. Jing et al., "COVID-19 Modelling by Time-varying Transmission Rate Associated with Mobility Trend of Driving via Apple Maps," *Journal of Biomedical Informatics*, p. 103 905, 2021. DOI: 10.1016/j.jbi.2021.103905.

[9] L. J. Robertson et al., "Evaluation of the IgG antibody response to SARS CoV-2 infection and performance of a lateral flow immunoassay: cross-sectional and longitudinal analysis over 11 months," *BMJ Open*, vol. 11, no. 6, e048142, 2021. DOI: 10.1136/bmjopen-2020-048142.

[10] **K. Y. Ng**, E. Frisk, M. Krysander, and L. Eriksson, "A Realistic Simulation Testbed of a Turbocharged Spark-Ignited Engine System: A Platform for the Evaluation of Fault Diagnosis Algorithms and Strategies," *IEEE Control Systems Magazine*, vol. 40, pp. 56–83, 2 2020. DOI: 10.1109/MCS.2019.2961793.

[11] **K. Y. Ng** and M. M. Gui, "COVID-19: Development of a robust mathematical model and simulation package with consideration for ageing population and time delay for control action and resusceptibility," *Physica D: Nonlinear Phenomena*, vol. 411, p. 132 599, 2020. DOI: 10.1016/j.physd.2020.132599.

[12] D. Jung, **K. Y. Ng**, E. Frisk, and M. Krysander, "Combining model-based diagnosis and data-driven anomaly classifiers for fault isolation," *Control Engineering Practice*, vol. 80, pp. 146–156, 2018. DOI: 10.1016/j.conengprac.2018.08.013.

[13] L. H. Lee et al., "Sustainable approach to biotransform industrial sludge into organic fertilizer via vermicomposting: A mini-review," *Journal of Chemical Technology & Biotechnology*, vol. 93, no. 4, pp. 925–935, 2018. DOI: 10.1002/jctb.5490.

[14] S. J. W. Tang, V. Kalavally, **K. Y. Ng**, C. P. Tan, and J. Parkkinen, "Real-Time Closed-Loop Color Control of a Multi-Channel Luminaire Using Sensors Onboard a Mobile Device," *IEEE Access*, vol. 6, pp. 54 751–54 759, 2018. DOI: 10.1109/ACCESS.2018.2872320.

[15] J. H. T. Ooi, C. P. Tan, S. Nurzaman, and **K. Y. Ng**, "A Sliding Mode Observer for Infinitely Unobservable Descriptor Systems," *IEEE Transactions on Automatic Control*, vol. 62, no. 7, pp. 3580–3587, 2017. DOI: 10.1109/TAC.2017.2665699.

[16] S. Tang, V. Kalavally, **K. Y. Ng**, and J. Parkkinen, "Development of a prototype smart home intelligent lighting control architecture using sensors onboard a mobile computing system," *Energy and Buildings*, vol. 138, pp. 368–376, 2017. DOI: 10.1016/j.enbuild.2016.12.069.

[17] J. Y. Ng, C. P. Tan, H. Trinh, and **K. Y. Ng**, "A common functional observer scheme for three systems with unknown inputs," *Journal of the Franklin Institute*, vol. 353, no. 10, pp. 2237–2257, 2016. DOI: 10.1016/j.jfranklin.2016.03.020.

[18] J. Y. Ng, C. P. Tan, **K. Y. Ng**, and H. Trinh, "New results in common functional state estimation for two linear systems with unknown inputs," *International Journal of Control, Automation and Systems*, vol. 13, no. 6, pp. 1538–1543, 2015. DOI: 10.1007/s12555-014-0315-x.

[19] J. H. T. Ooi, C. P. Tan, and **K. Y. Ng**, "State and Fault Estimation For Infinitely Unobservable Descriptor Systems Using Sliding Mode Observers," *Asian Journal of Control*, vol. 17, no. 4, pp. 1458–1461, 2015. DOI: 10.1002/asjc.1033.

[20] C. Y. Kee, C. P. Tan, **K. Y. Ng**, and H. Trinh, "New results in robust functional state estimation using two sliding mode observers in cascade," *International Journal of Robust and Nonlinear Control*, vol. 24, no. 15, pp. 2079–2097, 2014. DOI: 10.1002/rnc.2973.

[21] **K. Y. Ng**, C. P. Tan, and D. Oetomo, "Disturbance decoupled fault reconstruction using cascaded sliding mode observers," *Automatica*, vol. 48, no. 5, pp. 794–799, 2012. DOI: 10.1016/j.automatica.2012.02.005.

[22] **K. Y. Ng**, C. P. Tan, R. Akmeliawati, and C. Edwards, "Disturbance decoupled fault reconstruction using sliding mode observers," *Asian Journal of Control*, vol. 12, no. 5, pp. 656–660, 2010. DOI: 10.1002/asjc.231.

[23] **K. Y. Ng**, C. P. Tan, Z. Man, and R. Akmeliawati, "New results in disturbance decoupled fault reconstruction in linear uncertain systems using two sliding mode observers in cascade," *International Journal of Control, Automation and Systems*, vol. 8, no. 3, pp. 506–518, 2010. DOI: 10.1007/s12555-010-0303-8.

[24] **K. Y. Ng**, C. P. Tan, C. Edwards, and Y. C. Kuang, "New results in robust actuator fault reconstruction for linear uncertain systems using sliding mode observers," *International Journal of Robust and Nonlinear Control*, vol. 17, no. 14, pp. 1294–1319, 2007. DOI: 10.1002/rnc.1170.

Publications: Peer-Reviewed Conference Articles

[1] S. Wucherer, R. McMurray, **K. Y. Ng**, and F. Kerber, "Predicting Maximum Permitted Process Forces for Object Grasping and Manipulation Using a Deep Learning Regression Model," in *8th IEEE Conference on Control Technology and Applications (CCTA)*, 2024, pp. 669–674. DOI: 10.1109/CCTA60707.2024.10666569.

[2] N. McCallan, S. Davidson, **K. Y. Ng**, P. Biglarbeigi, D. Finlay, B. L. Lan, and J. McLaughlin, "Rebalancing Techniques for Asynchronously Distributed EEG Data to Improve Automatic Seizure Type Classification," in *2023 57th Annual Conference on Information Sciences and Systems (CISS)*, 2023, pp. 1–6. DOI: 10.1109/CISS56502.2023.10089669.

[3] S. Davidson, N. McCallan, **K. Y. Ng**, P. Biglarbeigi, D. Finlay, B. L. Lan, and J. McLaughlin, "Epileptic Seizure Classification Using Combined Labels and a Genetic Algorithm," in *2022 IEEE 21st Mediterranean Electrotechnical Conference (MELECON)*, 2022, pp. 430–435. DOI: 10.1109/MELECON53508.2022.9843099.

[4] S. Davidson, N. McCallan, **K. Y. Ng**, P. Biglarbeigi, D. Finlay, B. L. Lan, and J. McLaughlin, "Seizure Classification Using BERT NLP and a Comparison of Source Isolation Techniques with Two Different Time-Frequency Analysis," in *2022 IEEE Signal Processing in Medicine and Biology Symposium (SPMB)*, 2022, pp. 1–7. DOI: 10.1109/SPMB55497.2022.10014769.

[5] N. McCallan, S. Davidson, **K. Y. Ng**, P. Biglarbeigi, D. Finlay, B. L. Lan, and J. McLaughlin, "Seizure Classification of EEG based on Wavelet Signal Denoising Using a Novel Channel Selection Algorithm," in *2021 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, 2021, pp. 1269–1276.

[6] **K. Y. Ng**, E. Frisk, and M. Krysander, "Design and Selection of Additional Residuals to Enhance Fault Isolation of a Turbocharged Spark Ignited Engine System*," in *2020 7th International Conference on Control, Decision and Information Technologies (CoDIT)*, vol. 1, 2020, pp. 76–81. DOI: 10.1109/CoDIT49905.2020.9263792.

[7] N. McCallan, D. Finlay, P. Biglarbeigi, G. Perpiñan, M. Jennings, **K. Y. Ng**, J. McLaughlin, and O. Escalona, "Wearable Technology: Signal Recovery of Electrocardiogram From Short Spaced Leads in the Far-Field Using Discrete Wavelet Transform Based Techniques," in *2019 Computing in Cardiology (CinC)*, 2019, pp. 1–4. DOI: 10.23919/CinC49843.2019.9005868.

[8] P. Biglarbeigi, D. McLaughlin, K. Rjoob, Abdullah, N. McCallan, A. Jasinska-Piadlo, R. Bond, D. Finlay, **K. Y. Ng**, A. Kennedy, and J. McLaughlin, "Early Prediction of Sepsis Considering Early Warning Scoring Systems," in *2019 Computing in Cardiology (CinC)*, 2019, pp. 1–4. DOI: 10.23919/CinC49843.2019.9005630.

[9] D. Jung, **K. Y. Ng**, E. Frisk, and M. Krysander, "A combined diagnosis system design using model-based and data-driven methods," in *2016 3rd Conference on Control and Fault-Tolerant Systems (SysTol)*, 2016, pp. 177–182. DOI: 10.1109/SYSTOL.2016.7739747.

[10] W. J. Lee, **K. Y. Ng**, C. L. Tan, and C. P. Tan, "Real-time face detection and motorized tracking using ScicosLab and SMCube on SoC's," in *2016 14th International Conference on Control, Automation, Robotics and Vision (ICARCV)*, 2016, pp. 1–6. DOI: 10.1109/ICARCV.2016.7838614.

[11] S. J. W. Tang, **K. Y. Ng**, V. Kalavally, and J. Parkkinen, "Closed-loop color control of an RGB luminaire using sensors onboard a mobile computing system," in *2016 IEEE Student Conference on Research and Development (SCOReD)*, 2016, pp. 1–5. DOI: 10.1109/SCORED.2016.7810062.

[12] W. C. Chew, **K. Y. Ng**, and B. H. Khoo, "ReCon-AVe: Remote Controlled Automobile Vehicle for Data Mining and Analysis," in *2015 IEEE 39th Annual Computer Software and Applications Conference*, vol. 2, 2015, pp. 569–574. DOI: 10.1109/COMPSAC.2015.170.

[13] S. J. W. Tang, **K. Y. Ng**, B. H. Khoo, and J. Parkkinen, "Real-Time Lane Detection and Rear-End Collision Warning System on a Mobile Computing Platform," in *2015 IEEE 39th Annual Computer Software and Applications Conference*, vol. 2, 2015, pp. 563–568. DOI: 10.1109/COMPSAC.2015.171.

[14] **K. Y. Ng**, C. P. Tan, and D. Oetomo, "Enhanced fault reconstruction using cascaded sliding mode observers," in *2012 12th International Workshop on Variable Structure Systems*, 2012, pp. 208–213. DOI: 10.1109/VSS.2012.6163503.

[15] C. Fernandes, **K. Y. Ng**, and B. H. Khoo, "Development of a convenient wireless control of an autonomous vehicle using apple iOS SDK," in *TENCON 2011 - 2011 IEEE Region 10 Conference*, 2011, pp. 1025–1029. DOI: 10.1109/TENCON.2011.6129266.

[16] **K. Y. Ng** and C. P. Tan, "New results in disturbance decoupled fault reconstruction in linear uncertain systems using two sliding mode observers in cascade," in *7th IFAC Symposium on Fault Detection, Supervision and Safety of Technical Processes*, vol. 42, 2009, pp. 780–785. DOI: 10.3182/20090630-4-ES-2003.00128.

[17] **K. Y. Ng**, C. P. Tan, R. Akmeliawati, and C. Edwards, "Disturbance Decoupled Fault Reconstruction using Sliding Mode Observers," in *17th IFAC World Congress*, vol. 41, 2008, pp. 7215–7220. DOI: 10.3182/20080706-5-KR-1001.01221.

[18] **K. Y. Ng**, C. P. Tan, C. Edwards, and Y. C. Kuang, "New result in robust actuator fault reconstruction with application to an aircraft," in *2007 IEEE International Conference on Control Applications*, 2007, pp. 801–806. DOI: 10.1109/CCA.2007.4389331.

[19] **K. Y. Ng**, C. P. Tan, and R. Akmeliawati, "Tolerance towards sensor failures: an application to a double inverted pendulum," in *Third IEEE International Workshop on Electronic Design, Test and Applications (DELTA'06)*, 2006, 6 pp.–434. DOI: 10.1109/DELTA.2006.92.

Publications: Book Chapters

[1] M. M. M. Islam, J. I. Emon, **K. Y. Ng**, A. Asadpour, M. M. R. A. Aziz, M. L. Baptista, and J.–M. Kim, "Artificial intelligence in smart manufacturing: Emerging opportunities and prospects," in *Artificial Intelligence for Smart Manufacturing and Industry X.0*. Springer Nature Switzerland, 2025, pp. 9–36. DOI: 10.1007/978-3-031-80154-9_2.

Publications: Technical Report and Thesis

[1] **K. Y. Ng**, "Design and Development of a Simulation Environment and a Fault Isolation Scheme on a Volvo VEP4 MP Engine," Research and Development Centre, Volvo Car Corporation, Gothenburg, Sweden, Tech. Rep., 2015.

[2] **K. Y. Ng**, "Advancements in robust fault reconstruction using sliding mode observers," Ph.D. dissertation, Monash University, 2009. DOI: 10.4225/03/587c001b22509.

Grants and Funding (Total >GBP6.5mil)

2024 *PI*, GBP 233,379, DfE Higher Education Research Capital Fund (HERC), *Multi-Agent Robotics Centre (MARC)*
2024 *PI*, GBP 49,666, EPSRC Innovation Launchpad Network+ (ILN+) Researcher in Residence Scheme (RiR)
Empowering Green Futures: Developing Energy Mapping Digital Twin Technology for Sustainable Wind Turbine Energy in NI
2024 *Co-I*, GBP 29,000, InterTrade Ireland Innovation Boost, Industrial Partner: ARQ Reliability
2024 *PI*, GBP 214,060, Innovate UK: Knowledge Transfer Partnerships (KTP), Industrial Partner: Elite Electronic Systems Ltd
2024 *Co-I*, GBP 21,450, Garfield Weston Trust (GWT), *Showcasing and Empowering Women in STEM*
2023 *Co-I*, GBP 782,502, EPSRC, *Multi-User Vector Network Analysis (VNA) Facility Core Equipment*
2020 *Co-I*, MYR 980,000, Monash University Malaysia-ASEAN Sustainable Development Research Grant Scheme
Genomic variations and association study of agronomic traits in Malaysia, Myanmar and Thailand weedy rice (Oryza sativa L.*)*
2019 *Co-I*, GBP 18,750, InterTradeIreland FUSION, Industrial Partner: TERRA NutriTECH
2018 *Co-I*, GBP 4,889,812, EPSRC, *SAFEWATER*
2018 *PI*, GBP 934.45, Erasmus+ Staff Mobility Programme, Academic Partner: Tech. Uni. of Applied Sciences Augsburg, Germany
2018 *PI*, GBP 500, NVIDIA GPU Grant Programme
2015 *Co-I*, SEK 960,000, Volvo Cars, Gothenburg, Sweden
Design and Development of a Simulation Environment and a Fault Isolation Scheme on a VEP4 Engine
2015 *Co-I*, MYR 127,000, Fundamental Research Grant Scheme, Ministry of Higher Education, Malaysia
Towards a Model Synthesis Framework for Conceptual Modeling of Cyber-Physical Systems
2014 *Co-I*, MYR 93,200, Fundamental Research Grant Scheme, Ministry of Higher Education, Malaysia
A New Mathematical Framework for Smooth Curve Generation with Direct Incorporation of Uncertainties
2014 *Co-I*, MYR 168,000, EScienceFund, Ministry of Higher Education Malaysia
Design And Development of a Novel Ankle Rehabilitation Robot using Shape Memory Alloy Actuator
2013 *PI*, MYR 50,000, ItraMAS Corporation Malaysia, *Mobile Control of Intelligent Lighting Systems*
2012 *PI*, MYR 55,000, Monash University Malaysia Internal Grant
Application of Sliding Mode Observer for Fault Diagnosis on a Robotic System
2012 *Co-I*, MYR 50,000, Exploratory Research Grant Scheme, Ministry of Higher Education Malaysia
Working Model of a Parallel Pneumatic Regenerative Braking/Launch Assist for Light Motor Vehicles
2010 *Co-I*, MYR 30,000, Fundamental Research Grant Scheme, Ministry of Higher Education, Malaysia
Development of Common Observer Schemes Using Sliding Mode Techniques for Robust State Estimation and FDI
2010 *Co-I*, MYR 10,000, Fundamental Research Grant Scheme, Ministry of Higher Education, Malaysia
Effects of Noise Generation, Vibration and Model Size Reduction on TRSC in Solving Vehicle Noise Problems
2010 *PI*, MYR 35,000, Monash University Malaysia Internal Grant
Embedded Mathematical, Simulation and Control Application on Mobile Computing Platform

*GBP1 $\approx$ MYR5.70, SEK13.07 as of January 7, 2025

Editorial Boards and Organising Committee of Conferences

2018–present *IEEE Access*, Associate Editor
2020–present *IEEE TechRxiv*, Moderator
2020–present *PeerJ Computer Science*, Editor
2024 *IEEE Signal Processing in Medicine and Biology Symposium (SPMB 2024)*, Technical Program Chair
2024 *The 8th IEEE Conference on Control Technology and Applications (CCTA 2024)*, Workshop Chair and Session Chair
2024 *The 35th Irish Signals and Systems Conference (ISSC 2024)*, Programme Committee and Session Chair
2023 *IEEE Signal Processing in Medicine and Biology Symposium (SPMB 2023)*, Technical Program Chair
2022–2023 *AIMS Mathematics*, Lead Guest Editor — SI on "Fault Diagnosis: Mathematical Models, Algorithms, & Application"
2022 *IEEE Signal Processing in Medicine and Biology Symposium (SPMB 2022)*, Program Chair and Lecture Chair
2020 *7th International Conference on Control, Decision and Information Technologies (CoDIT'20)*, Prog. Comm. Member
2020 *International Conference on Recent Innovations in Engineering and Technology (ICRIET-20)*, Prog. Comm. Member
2012 *International Conference on Intelligent Robotics, Automation and Manufacturing (IRAM 2012)*, Co-Chair of Reg.

Invited Lectures, Seminars, and Workshops

2024 "Digital Twin of a Vehicular Engine for Fault Diagnosis"
Intelligent Systems Research Centre (ISRC), Ulster University, UK
2024 "Digital Twin of a Vehicular Engine as a Simulation Environment Platform for Fault Diagnosis"
Workshop, *The 8th IEEE Conference on Control Technology and Applications (CCTA)*, UK
2022 "Understanding Transmission Dynamics of Infectious Diseases Using Complex Networks"
School of Engineering, University of Warwick, UK
2020 "Engineering in Medical and Healthcare"
School of Mechanical, Aerospace and Automotive Engineering, Coventry University, UK
2019 "A Realistic Simulation Testbed of A Vehicular Engine System"
School of Engineering Research Seminar Series, Ulster University, UK
2019 Panel Discussion on "Robots and Automated Systems"
IET NI Robotics League, Ulster University, UK
2018 "A Turbocharged Petrol Engine System as a Simulation Benchmark Model for Fault Diagnosis"
Faculty of Electrical Engineering, Technical University of Applied Sciences Augsburg, Germany
2018 "Design and Development of A Fault Isolation Scheme on A Vehicular Engine System"
Faculty of Electrical Engineering, Technical University of Applied Sciences Augsburg, Germany
2017 "Beyond Calls and Games: Utilising The Full Potentials of Smartphones"
TEDx Sunway University: The Untold Ideas, Malaysia
2016 "Design and Development of a Simulation Environment for Fault Isolation on an Engine System"
Centre for Automotive Research, National University of Malaysia, Malaysia
2015 "Using a Smartphone Monoscopic Camera for Real-Time Lane Detection and Rear-End Collision Warning"
Machine Vision and Pattern Recognition Laboratory (MVPR), Lapeenranta University of Technology, Finland
2015 "Real-Time Lane Detection and Rear-End Collision Warning System on A Mobile Computing Platform"
Computer Science School of Computing, University of Eastern Finland, Finland
2014 "Robust Fault Diagnosis Using Sliding Mode Observers"
Division of Vehicular Systems, Linköping University, Sweden
2014 "Robust Fault Reconstruction Using SMOs and Real-Time Image Processing on A Mobile Device"
Department of Electrical, Electronic and Systems Engineering, National University of Malaysia, Malaysia
2012 "Disturbance Decoupled Fault Reconstruction Using Multiple Sliding Mode Observers"
Department of Telecommunications, Electrical, Robotics and Biomedical Engineering,
Swinburne University of Technology, Australia
2011 "Fault Reconstruction Using Sliding Mode Observer: Application to an Aircraft"
National Defence University of Malaysia, Malaysia
2010 "Robust Fault Reconstruction Scheme Using Sliding Mode Observers In Cascade"
School of Engineering, Deakin University, Australia

Reviewer for Funding

2019–present Newton Funds

Reviewer for International Peer-Reviewed Journals

Automatica (Elsevier)
IEEE Transactions on Industrial Electronics (TIE) (IEEE)
IEEE Transactions on Instrumentation and Measurement (TIM) (IEEE)
IEEE Journal of Biomedical and Health Informatics (JBHI) (IEEE)
IEEE Access (IEEE)
International Journal of Robust and Nonlinear Control (IJRNC) (Wiley)
Control Engineering Practice (CONENGPRAC) (Elsevier)
European Journal of Control (EJCON) (Elsevier)
Asian Journal of Control (AJC) (Wiley)

Computers and Electrical Engineering (COMPELECENG) (Elsevier)
Circuits, Systems and Signal Processing (CSSP) (Springer)
Building Simulation (Springer)
International Journal of Applied and Computational Mathematics (IACM) (Springer)
International Journal of Advanced Robotic Systems (IJARS) (SAGE)
International Journal of Control (IJC) (Taylor & Francis)
Australian Journal of Electrical and Electronics Engineering (AJEEE) (Taylor & Francis)

External PhD Examiner
Deakin University, Australia
Coventry University, UK

Supervision of Graduate Research and Associates

2024–present	Mr Phil Watson (InterTradeIreland Research Associate, Ulster University and ARQ Reliability)
2024–present	Ms Shruthi Kogileru (KTP Associate, Ulster University and Elite Electronic Systems Ltd)
2024–present	Mr Brian Kirch (PhD, Ulster University)
2021–present	Ms Stefanie Wucherer (PhD, Ulster University, Technical University of Applied Sciences Augsburg, and Technology Transfer Center for Flexible Automation in Nördlingen)
2021–present	Mr Will Aston (PhD, Ulster University)
2020–2024	Dr Towfeeq Fairooz (PhD, Ulster University)
2019–2024	Dr Scot Davidson (PhD, Ulster University)
2019–2024	Dr Niamh McCallan (PhD, Ulster University)
2019–2020	Mr Colin Maher (FUSION Project Manager, Ulster University and TERRA NutriTech)
2017–2020	Mr Da Yi Lee (Master's by Research, Monash University)
2015–2018	Mr Leong Hwee Lee (Master's by Research, Monash University)
2015–2018	Mr Samuel Jia Wei Tang (Master's by Research, Monash University)
2012–2016	Dr Jiunn Yea Ng (PhD, Monash University)
2011–2015	Dr Jeremy Hor Teong Ooi (PhD, Monash University)
2010–2014	Dr Chew Yee Kee (PhD, Monash University)
2009–2012	Dr Jen Nee Lim (PhD, Monash University)

Updated: March 24, 2025