CURRICULUM VITAE

Sharafiz Abdul Rahim, *Ph.D.*
Senior Lecturer
Faculty of Engineering
Universiti Putra Malaysia
43400 Serdang, Selangor, Malaysia
T: +601129305008
Email: sharafiz@upm.edu.my

Education

PhD in Mechanical Engineering, 2018, University of Sheffield, UK.
Thesis title: ***Investigating the Effect of Variable Mass Loading in Structural Health Monitoring from Machine Learning Perspective.***

Master of Science (MSc) in Dynamics and Control, 2009, University of Bath, UK.

Bachelor's in Mechanical Engineering (Hons), 2008, University of Bath, UK.

Summary

Experienced Senior Lecturer in Mechanical and Manufacturing Engineering with over 10 years of academic and research involvement. Specializes in vibration-based structural health monitoring, predictive maintenance, and AI-driven fault detection. Skilled in MATLAB, Python, and data-driven diagnostic modeling. Passionate about integrating machine learning with mechanical systems for real-world engineering applications.

Areas of Specialization

- Structural Health Monitoring (SHM)
- Predictive Maintenance
- Condition-Based Monitoring (CBM)
- Vibration Analysis
- Machine Learning Applications in Mechanical Systems
- MATLAB & Simulink Modeling

Appointments

Position	Duration
Academic Research Fellow Visitor, School of Engineering, Warwick University, UK.	17th May 2024 –17th April 2025
Deputy Head, Sound and Vibration Research Group Laboratory, Engineering Faculty, UPM.	Feb 2024 - Present
Senior Lecturer, Department of Mechanical and Manufacturing Engineering, Faculty of Engineering, UPM.	Dec 2019-present
• Academic Coordinator II- Department of Mechanical and Manufacturing.	1st June 2021 – 31st Dec 2023
• Academic Advisor- Bachelor of Engineering in Mechanical Engineering.	Dec 2019-present
• Department Coordinator-ASEAN DATA SCIENCE EXPLORERS (ADSE) SESSIONS.	12th Feb 2020 – 11th May 2020
• Team Supervisor- Innovate Malaysia Design Competition (Design Challenge) 2021.	29-30 Sept 2020
Machine Learning Engineer, Essiell Ltd, Brighton UK.	March 2019 to August 2019
Academic Fellow, Department of Mechanical and Manufacturing Engineering, Faculty of Engineering, UPM.	April 2014 to September 2019
Lecturer, Automotive Engineering Division, Malaysia France Institute, Universiti Kuala Lumpur.	June 2011 to Jan 2014
Lecturer, Mechanical Engineering Department, Malaysia Spanish Institute, Universiti Kuala Lumpur.	Dec 2009 to June 2011

Grants

1. Putra IPM Grant. Data Driven Vibration-Based Damage Detection System Using Machine Learning and Deep Neural Network. Total grant: RM 51,200. Period: 17th August 2020 – 16th August 2024. *Status: Ongoing.*

2. Malaysian Public Works Department-CREaTE Research Grant. Condition-Based Predictive Maintenance of Lifts System Using Internet Of Things (Iot) and Big Data Analytics. Total Grant: RM 250,000. Period: 24th May 2021-24th November 2023. *Status: Completed.*

Technical Skills

1. Programming: MATLAB, Python, Simulink, Arduino

2. Data Analysis: Signal Processing, FFT, Machine Learning

3. Software: ANSYS, SolidWorks, LabVIEW, National Instrument, LMS

4. Tools: Sensors & Signal Processing, Data Acquisition Systems

Publications

Journals / Conference Proceedings

1. **SA Rahim,** G Manson, F Mustapha. (2023). Damage Detection of the Jabiru's Aircraft Wing under Operational Fuel Loading Conditions using Neural Network, Journal of Aeronautics, Astronautics and Aviation 56 (1), 1-7, 2023.

2. **SA Rahim,** Manson G. (2021). Kernel Principal Component Analysis for Structural Health Monitoring and Damage Detection of an Engineering Structure under Operational Loading Variations, Journal of Failure Analysis and Prevention (6), 1981-1990, Springer.

3. Ma, Y, Mustapha, F, Ishak MR, **SA Rahim**, & Mustapha M. (2023). Structural fault diagnosis of UAV based on convolutional neural network and data processing technology. Nondestructive Testing and Evaluation, 39(2), 426–445. https://doi.org/10.1080/10589759.2023.2206655

4. Ruixin Zhao, Sai Hong Tang, Eris Elianddy Bin Supeni, **SA Rahim**, Luxin Fan. (2024). Z-YOLOv8s-based approach for road object recognition in complex traffic scenarios, Alexandria Engineering Journal, Volume 106, 2024, pages 298-311, ISSN 1110-0168, https://doi.org/10.1016/j.aej.2024.07.011.

5. **SA Rahim**, Manson G, Azizi MA. (2021). Data Clustering Model based on Gaussian Mixture Model and Expectation-Maximization Algorithm for Data-driven Structural Health Monitoring System, International Journal of Integrated Engineering (IJIE), ISSN: 2229-838X e-ISSN: 2600-7916.

6. Ma, Y, Mustapha F, Ishak M, **Rahim SA,** Mustapha M. (2022). Data-driven Methods for Damage Detection and Identification of UAV: A Review. Journal of Aeronautics, Astronautics and Aviation, 54(4), 405-420, https://doi.org/10.6125/JoAAA.202212_54(4).04.

7. **SA Rahim**, Manson G, Worden K. (2019). Investigating the effect of variable mass loading in Structural Health Monitoring from a Machine Learning Perspective, Ph. D Thesis, University of Sheffield.

8. Ma, Yumeng, Mustapha F., Ishak M., **SA Rahim,** Mustapha M. (2023). Damage Identification Through a Vibration Based Data of a Quad-Rotor Unmanned Aerial Vehicle (Uav) Using Convolutional Neural Networks (CNN's), Available at SSRN 4354049.

9. Ma, Yumeng, Mustapha F, Ishak M., **SA Rahim**, Mustapha M. (2023). Structural fault diagnosis of UAV based on convolutional neural network and data processing technology Nondestructive Testing and Evaluation,Taylor & Francis.

10. Ruixin Zhao, Sai Hong Tang, Jiazheng Shen, Eris Elianddy Bin Supeni, **SA Rahim**. (2024). Enhancing autonomous driving safety: A robust traffic sign detection and recognition model TSD-YOLO, Signal Processing, Volume 225, 109619, ISSN 0165-1684, https://doi.org/10.1016/j.sigpro.2024.109619.

11. Zhao, R., Tang, S., Supeni, E.E.B., **SA Rahim**, Fan, L. (2024). A Review of Object Detection in Traffic Scenes Based on Deep Learning. Applied Mathematics and Nonlinear Sciences, 2024, Sciendo, vol. 9 no. 1, https://doi.org/10.2478/amns-2024-0322

12. **SA Rahim,** Manson G, Worden K**.** (2018)**.** Data visualization approach for operational loading variations of an aircraft wing box using vibration-based

damage detection, 8th European Workshop on Structural Health Monitoring, EWSHM 2016, 4, pp. 2893-2902. 2018.

13. **SA Rahim,** Manson G, Worden K. (2017). Principal component analysis and artificial neural network framework for damage detection strategy under varying operational loading conditions, Structural Health Monitoring 2017: Real-Time Material State Awareness and Data-Driven Safety Assurance - Proceedings of the 11th International Workshop on Structural Health Monitoring, IWSHM 2017, 1, pp. 520-526.

14. Y Ma, F Mustapha, MR Ishak, **SA Rahim**, M Mustapha. (2022). Data-driven Methods for Damage Detection and Identification of UAV: A Review, Journal of Aeronautics, Astronautics and Aviation 54 (4), 405-420.

15. **SA Rahim,** A. J. Hillis, Frequency Shift in Tracking the Damage of Fixed Offshore Structures, Journal of Applied Sciences, DOI:10.3923/jas.2011.1688.1697, Oct 2011. *Published*

16. Azim**, SA Rahim,** Development of Peri dynamic Model for Impact Test of Polypropylene and Polycarbonate, Springer Book Series: Structural Integrity Cases in Mechanical and Civil Engineering, ISSN: 2522-560X, 2021. *Published*

17. MSJ Singh, NAA Jalil, **SA Rahim**, ZA Zulkefli, H Hasini, Thermo-Economic Analysis of a Coal-Fired Power Plant (CFPP) Using Turbine Cycle Heat Rate and Plant Net Heat Rates at Various Operating Loads, Pertanika Journal of Science & Technology 30 (2) 2022. *Published*.

18. Singh, Manmit Singh Jasbeer; Jalil, Nawal Aswan Abdul; **SA Rahim**; Zulkefli, Zamir Aimaduddin; Hasini, Hasril. (2022). Heat Rate Deviation Analysis of a Coal-Fired Power Plant (CFPP) with the Influence of Applicable Coal Prices (ACP).

19. Azizi, Muhammad Azim; Ridhuan, Mohd Faiz Mohd; Zahari, Mohd Zakiyuddin Mohd; **SA Rahim**; Azman, Muhammad Amin. (2022). Peri dynamic Model for Tensile Elongation and Fracture Simulations of Polymethyl Methacrylate Notched Specimens Applied Mechanics and Materials 909, Trans Tech Publications Ltd, Nov-28 2022.

Supervisions

Master and Ph.D.

1. Nithiyan a/l Selvadorai. GS55615. Master of Engineering Management (*Main Supervisor*).

Thesis: **Machine Health Monitoring and Fault Detection Using Artificial Neural Network**. Feb 2021.
Status: Completed.

2. Desmond Jayson A/L Stephen. GS56180. Master of Engineering Management (*Main Supervisor*).
   Thesis: **Data Visualization of Milling Process with The Effects of Material Parameters Variation Using Principal Component Analysis**. Feb 2021.
   Status: Completed.

3. Alireza Boldaji. GS53513. Master of Engineering Management (*Main Supervisor*).
   Thesis: **Optimization of refining palm oil with neural network.** July 2021.
   Status: Completed.

4. Hussein Hussein Abdussalam Mohammed. GS61006. Doctor of Philosophy in Mechanical Engineering (*Main Supervisor*). June 2025
   Thesis: **Data-Driven Condition Monitoring Program for Pipeline System.**
   Status: Completed

5. *Deghhaninahrkhalaji Adnan. GS63312.* Doctor of Philosophy in Mechanical Engineering (*Main Supervisor*).
   Thesis: **Condition based Monitoring of Mechanical Systems using Deep Learning.**
   Status: Ongoing.

6. Xiong Qiaoqiao. GS58734**.** Doctor of Philosophy in Mechanical Engineering *(Co-supervisor).*
   Thesis: **Development of Small Samples Real-Time Tiny Surface Defects Detection Method Based on Deep Learning.**
   Status: Completed.

7. Ma Yumeng. GS58166. Doctor of Philosophy in Aerospace Engineering *(Co-supervisor).*
   Thesis: **Damage detection and identification for Multi-rotor aircraft based on Deep Learning.**
   Status: Completed.

8. Roziyanna Bt Ahmad. GS54472. Doctor of Philosophy in Manufacturing Systems Engineering *(Co-supervisor).*
   Thesis: **Development of Augmented Reality (Ar) Model for On Job Training (OJT) In Medical Device Industry.**
   Status: Completed.

9. Manmit Singh A/L Jasbeer Singh. GS56993. Doctor of Philosophy in Mechanical Engineering *(Co-supervisor).*
   Thesis: **Optimization of Coal Fired Power Plant Performance Management**

Status: Completed.

Supervisions

Bachelor's Program (Final Year Project)

1. Muhammad Haziq bin Mohd Zaki. 192598. Bachelor of Mechanical Engineering.
   Title: **Fault detection and monitoring of electric motor bearings using Machine Learning algorithms.**
   Completed.

2. Suhrisman bin Aris. 193496. Bachelor of Mechanical Engineering.
   Title: **Damage Detection and Health Monitoring of a vibration signal using a Deep learning network.**
   Completed.

3. Tan Wan Ying. 202733. Bachelor of Mechanical Engineering
   Title: **Fault Detection and Monitoring of Hydraulic Pump Based on Convolutional Neural Network.**
   Completed.

4. Nur Hidayatul Ezzaty Binti Mohd Fadhli. 200819. Bachelor of Mechanical Engineering.
   Title**: Artificial Intelligence Based Fault Detection Solution Using Machine Learning for An Electric Motor.**
   Completed.

5. Amir Najmi Bin Yusaini 195921. Bachelor of Mechanical Engineering.
   Title: **The Effects of Signal Processing Techniques In Damage Detection Based On Wavelet Transform and Structural Health Monitoring.**
   Completed.

Academic Teachings

Bachelor's Program

1. ENG3202 Computer Programming (Credit hours: 2+2. Semester 2 2022/23).

2. EMM3528 Mechanical Vibrations (Credit hours: 3+0. Semester 2 2021/22).

3. EMM3132 Engineering Statistics (Credit hours: 3+0. Semester 1 2021/22).

4. EMM3105 Dynamics (Credit hours: 3+0. Semester 2 2019/20).

5. ECC3012 Engineering Mathematics II (Credit hours: 3+0. Semester 1 2020/21).

6. EMM3520 Control and Instrumentation (Credit hours: 3+0. Semester 1 2020/21).

7. EMM3810 Mechanical Engineering Laboratory III- Thermal fluids (Credit hours: 0+1. Semester 2 2020/21).

8. Noise, Vibration and Harshness (bachelor's in automotive engineering technology, UniKL MFI)- (Credit hours: 2+1. 2011 - 2013).

Languages

- English – Fluent
- Malay – Native