Research

Associate Professor Dr. Mohd Herwan Sulaiman: Innovator in Electrical Engineering and Artificial Intelligence

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PEKAN, 14 March 2025 – In the world of electrical engineering and artificial intelligence (AI), the name Associate Professor Dr. Mohd Herwan Sulaiman is increasingly recognised as an active researcher in power system optimisation and AI innovations in the energy sector.

Hailing from Johor, he currently serves as the Deputy Dean (Research and Postgraduate Studies) at the Faculty of Electrical and Electronics Engineering Technology (FTKEE), Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA).

He has produced numerous high-impact research projects that have helped the energy industry transition towards greater efficiency and sustainability.

He is also ranked among the top 2% of scientists worldwide, according to Elsevier and Stanford University.

Born with a deep passion for technology and real-world problem-solving, Associate Professor Dr. Mohd Herwan began his academic journey at Universiti Teknologi Malaysia (UTM), where he earned his Bachelor's, Master's, and Doctorate degrees in electrical engineering.

He acknowledged that his interest in AI research and energy systems was driven by the industry's need for better solutions to address inefficiencies in power systems.

"I first became interested in how technology can be used to solve real-world problems, particularly in the energy sector.

"This led me to explore in-depth research in artificial intelligence and optimisation methods such as metaheuristic algorithms," he stated.

Sharing about his research journey, Associate Professor Dr. Mohd Herwan received significant guidance from his supervisor at UTM, Professor Ir. Dr. Mohd Wazir Mustaffa, who shaped his approach to innovative research and modern technology application in energy.

As a researcher who keeps up with the latest technological advancements, Associate Professor Dr. Mohd Herwan employs various advanced methods in his studies.

Some of the key methodologies he applies include Artificial Neural Networks (ANN) and Kolmogorov-Arnold Networks (KAN) for energy forecasting models, as well as the Barnacles Mating Optimiser (BMO) and Evolutionary Mating Algorithm (EMA) for power system optimisation.

According to him, these approaches offer higher efficiency compared to conventional methods,

significantly improving energy forecasting accuracy and battery degradation analysis.

“I chose this approach because it not only provides high accuracy but also overcomes the limitations of traditional methods in energy system analysis,” he explained.

One of Associate Professor Dr. Mohd Herwan’s most significant contributions to electrical engineering is the development of the Barnacles Mating Optimiser (BMO), a new method for energy system optimisation.

Additionally, his research on the use of Kolmogorov-Arnold Networks (KAN) for battery charge estimation has opened new avenues for further studies in the energy industry.

“KAN is still in its early stages of exploration by other researchers, but we have successfully demonstrated its potential in energy applications and battery degradation analysis,” he stated.

As a lecturer and researcher, he admitted that the greatest challenge is balancing teaching, research, and administrative responsibilities.

“Good time management and support from fellow researchers and students have greatly helped me juggle these three responsibilities,” he said.

He is also actively involved in mentoring young researchers and has conducted numerous workshops on journal writing using generative AI at the faculty, university, and even national levels.

One of his key initiatives is the Talk Using AI in Publication session organised by Universiti Islam Pahang Sultan Ahmad Shah (UnIPSAS).

According to Associate Professor Dr. Mohd Herwan, research collaborations with various stakeholders are crucial to gaining broader perspectives and solving complex issues such as climate change and sustainable energy.

“My research in energy and battery degradation can contribute to the development of more efficient and sustainable energy systems, which are vital in addressing global energy challenges,” he stated.

He also emphasised that funding and institutional support play a crucial role in ensuring the success of research initiatives.

Looking ahead, Dr. Mohd Herwan is confident that AI will continue to evolve rapidly and have a significant impact on the energy industry.

“I hope my research can be applied in the industry, particularly in sustainable energy technologies and smart battery systems for electric vehicles.

“In addition, I aspire to nurture more young researchers who will continue to innovate in the fields of Electrical Engineering and AI.”

For those interested in entering the research world, Associate Professor Dr. Mohd Herwan advised them to always be curious, unafraid to explore new approaches, and seek mentors who can guide them.

“Most importantly, ensure that your research makes a real impact on society,” he added.

As a researcher who has achieved numerous successes in electrical engineering, Associate Professor Dr. Mohd Herwan continues to make his mark as an innovator in academia and industry.

With his expertise and passion for research, he serves as an inspiration to the next generation of researchers, encouraging them to further explore the ever-evolving world of technology.

By: Naqiah Puaad, Centre for Corporate Communications

Translation by: Dr Rozaimi Abu Samah, UMPSA Press

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