Research

# Associate Professor Ts. Dr. Roshahliza produce system used solar irrigation drip through IoT method

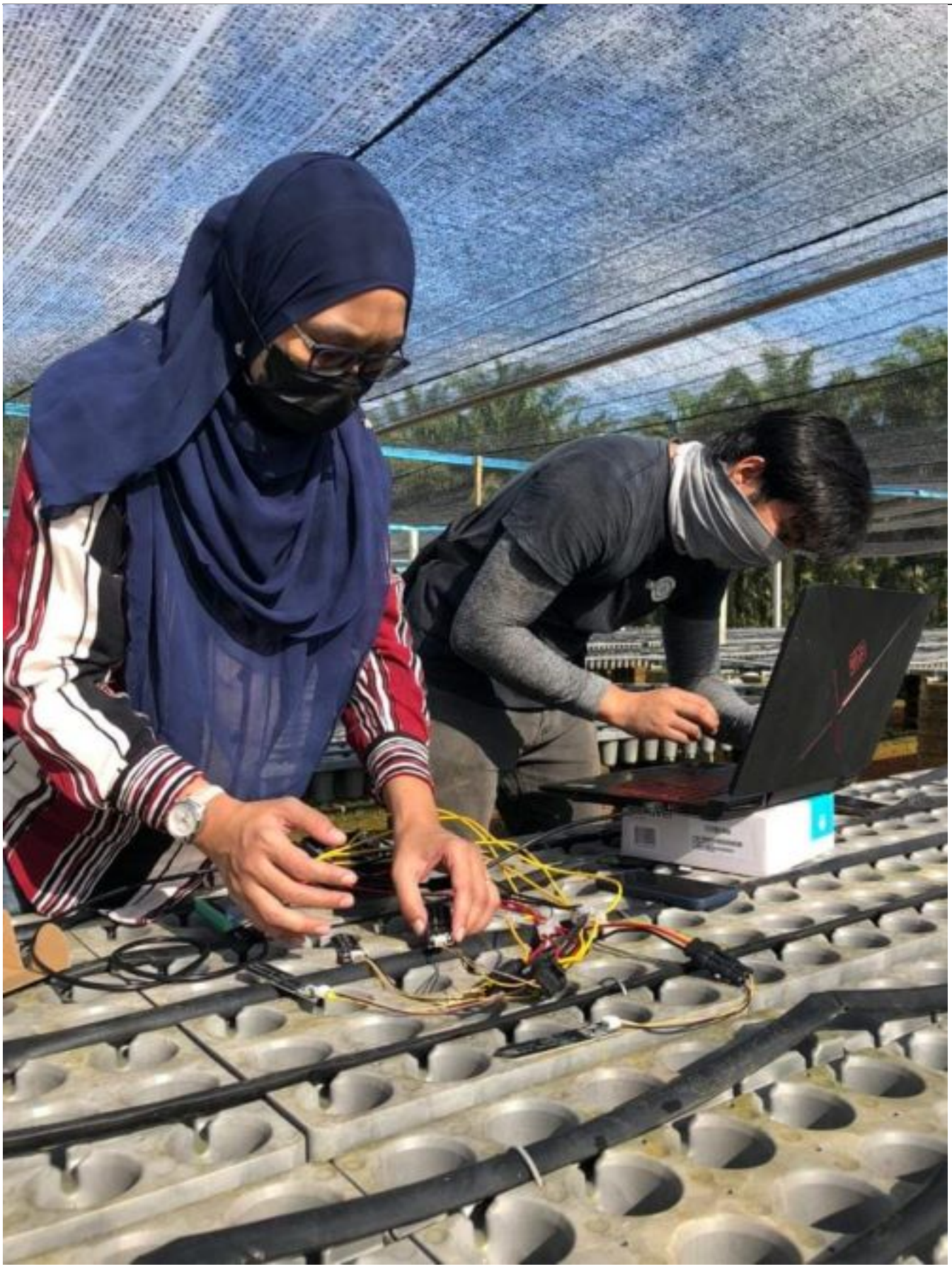
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PEKAN, 17 October 2023 - PaTrIoT, an abbreviation for Parit Tray IoT, is a solar irrigation system that utilizes drip irrigation to water small planting areas for oil palm seedlings, utilizing Internet of Things (IoT) technology.

While the Ditch Tray is a tool used to germinate oil palm seeds, it utilises IoT technology to regulate the incoming water to the tray.

According to Associate Professor Ts. Dr. Roshahliza M. Ramli, 40, a Senior Lecturer in the Faculty of Electrical and Electronic Engineering Technology (FTKEE), Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), her research project titled 'PATRIOT: IoT-Enabled Solar Irrigation System for Oil-Palm Pre-Nursery' commenced in March 2021 and was successfully concluded in November 2022.

“This research started after I successfully completed the smart solar irrigation system in 2020. “During the Creation, Innovation, and Technology and Research Exposition (CITREX) 2020 competition, I was approached by representatives from YP Plantation Holdings Sdn. Bhd. expressing interest in installing the system on a newly established oil palm seedling site.



“From there, we attempted to scale up the previously developed system to cover an area of approximately 0.7 hectares for the seedling site," stated the Kuala Lumpur native.

She explained that the developed system is fully powered by solar energy, serving as the energy

source for the equipment and components used in this project.

“We use solar-powered water pumps to transport water with ample pressure from the water storage tank to 46 irrigation lines.

“Each line has the capacity to irrigate up to 2,400 seeds simultaneously, triggered automatically when the water valve opens based on the predetermined schedule set by the field supervisor or through sensors installed on each line.

Each water valve in the irrigation line can also be remotely controlled through the mobile application developed in conjunction with this system," she said.

The research was conducted in collaboration with Dr. Nadzirah Mohd Mokhtar, a lecturer from the Faculty of Civil Engineering Technology (FTKA), and Ts. Joharizal Johari, a Vocational Training Officer from the Centre for Design and Innovation of Technology (PRInT).

The research also received assistance from Project Consultants and Advisors, Dato’ Dr. Mortaza Mohamed, as well as several final-year diploma and Bachelor of Engineering Technology students from FTKEE.

Also, providing assistance during that period were final-year students at the College of Engineering.

She further explained that the project, conducted through the MTUN-Industry Matching Grant, was also carried out in collaboration with several staff members from the Agriculture Department of YP Plantation Holdings Sdn. Bhd., led by Tuan Nik Rauzi Nik Halim@Che Ya.

“We hope that through this research, it can assist the industry in reducing labour costs and producing higher-quality oil palm seedlings that are less prone to diseases, while optimizing water resource utilization.



Consequently, operational costs can be minimized and more a lot of profit can achieve, thereby supporting the country's economy."

“In the future, we will continue to promote to oil palm plantation owners and agricultural sites with

small nurseries, such as agencies or farming companies interested in reducing operational costs as well as increase productivity and profitability.

“This system can be implemented on a small or large scale depending on the customer's needs.

The estimated cost for 12 irrigation lines with a capacity of 28,800 seeds is approximately RM 35,000," said the expert in Digital Signal Processing.

“Therefore, I hope more farmers can adopt this system and digitize their operations to enhance productivity and optimize water resources for agricultural activities," she added.

For the record, this research has received a gold medal at the Malaysia Technology Expo (MTE) 2023, a gold medal at CITREx 2022, and the Best Paper Award at the Malaysian Technical Universities Conference on Engineering and Technology (MUCET) 2021.

Among the other products Associate Professor Ts. Dr. Rosahliza has developed are the Smart Solar Irrigation System, Automatic Fertilizer Mixer System with Mobile Application, and Cattle Management and Identification System using RFID Technology.

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