

RISE

Catalysing Global Research Excellence

Robotics Technology: Driving Innovation, Transforming Future

**ReNeU's 1st
Anniversary**
Galvanising Research Excellence

**UiTM's Global Effort
in Training Young Aspiring
Neuroscientists**



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ADMINISTRATION

Prof. Ts. Dr Mohd Nazip Suratman

Deputy Vice-Chancellor (Research & Innovation)
Office of Deputy Vice-Chancellor (Research & Innovation)
nazip@uitm.edu.my
603-5544 2004

Dr Mohd Muzamir Mahat

Head of Research Communication & Visibility Unit (UKPV)
Research Communication & Visibility Unit (UKPV)
mmuzamir@uitm.edu.my
603-5544 3097

Miss Nur Syazwani Ahamad Azahari

Senior Statistician
Strategic Information Unit
wawa@uitm.edu.my
603-5544 3295

ABOUT THE MAGAZINE

RISE Magazine is published by Office of the Deputy Vice-Chancellor (Research & Innovation) with the aim of highlighting the research and innovation on of experts from multidisciplinary fields in UiTM. It serves as a platform for researcher to showcase their high quality and impactful findings, activities and innovative solution through publication. Contribution of these ideas come from academicians, researchers, graduates and universities professionals who will enhance the visibility of research and strive to elevate Universiti Teknologi MARA to global standards. This is an effort to promote research as a culture that should be embraced by everyone.

ABOUT UiTM

Universiti Teknologi MARA (UiTM) is a public university based primarily in Shah Alam, Malaysia. It has grown into the largest institution of higher education in Malaysia as measured by physical infrastructure, faculty and staff, and student enrollment. UiTM is the largest public university in Malaysia with numerous campuses throughout all 13 states in Malaysia. There is a mixture of research, coursework and programmes offered to the students. Office of the Deputy Vice-Chancellor (Research & Innovation) or known as TNCPI (*Timbalan Naib Canselor (Penyelidikan & Inovasi)*) serves a *Pusat Tanggungjawab (PTJ)* that navigates the research and innovation of university in achieving UiTM agenda. TNCPI office strives to mobilise the faculties, and campuses to move together and promotes cooperation among researchers in bringin UiTM as a leading global university of science, technology, and innovation by 2025.



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FOREWORD

VICE-CHANCELLOR



To excel globally, research must be weighed in as a key factor to navigate the university's direction in making an impact. This is especially when focusing on translational research where society can benefit greatly from its findings.

Congratulations to the Office of the Deputy Vice-Chancellor (Research and Innovation) on the publication of this magazine, aptly called RISE. I am pleased to see that the COVID-19 pandemic has not dampened UiTM researchers' pursuit of their dreams. The contents of these pages allow active research and innovation activities be shared with our stakeholders, local and international collaborators.

As UiTM aspires to be a world-renowned university by 2025, I believe that our current research practises are on track. For example, the featured article in the magazine highlights the key success of robotic technology ventured by our researcher, Associate Professor Dr Hanafiah Yussof, who formed a start-up company to advance robotic technology in Malaysia. His contribution to the robotics industry, the Robot Rehabilitation System for Autism Therapy, is an example of innovation that can transform the future.

In our pursuit of changing the future, we at UiTM are cognisant of the current and future direction of research to facilitate research from different disciplines. We have researchers using drones for pineapple plantations, exploring hybrid rockets with Equatorial Space System (ESS), and researching sanitation, collection, and sewage/wastewater treatment systems with Indah Water Konsortium (IWK) Sdn Bhd, to name a few of the work we have been actively involved in.

Hence, we will continue to contribute and make progress associated with processes and knowledge pivotal for impactful research, especially in developing knowledge-based technology that benefit society.

Ultimately, I am confident that the publication of this magazine will further strengthen the visibility of UiTM research and innovation.

Thank you.

PROFESSOR Ts. DR HAJAH ROZIAH MOHD JANOR

Vice-Chancellor

Universiti Teknologi MARA

FOREWORD

DEPUTY VICE-CHANCELLOR (RESEARCH & INNOVATION)



I would like to congratulate the editorial team on the release of RISE, a research magazine highlighting our research and innovation efforts and accomplishments. The magazine exemplifies our office's synergistic and collaborative efforts, as well as those of our researchers and article contributors, to advance the visibility agenda.

As the office in charge of research and innovation, we are constantly hoping that every research result and invention will benefit the community through translational research. Assoc. Prof. Dr Hanafiah Yussof's Robot Rehabilitation System for Autism Therapy, for example, has aided the autism community in improving communication. Even more proud that this endeavour resulted in the formation of a start-up company.

Despite the COVID-19 pandemic, UiTM researchers continued to conduct relevant research activities despite the uncertainty. The scale of the events varies from a small effort to install solar panels at a rural school and organise virtual conferences to the use of drones and precision agriculture technology on pineapple plantations. Notably, a Bioextreem solution capable of inhibiting 99.99 percent of bacteria and viruses was also developed.

With these accomplishments, we will continue to support research efforts, particularly those aimed at developing knowledge-based technology with a social benefit in mind.

Finally, I believe that this magazine can serve as a platform for the visibility agenda by incorporating a wide range of science and research perspective, fostering more potential collaboration between UiTM researchers and local and international institutions and industries.

Thank you.

PROFESSOR Ts. DR MOHD NAZIP SURATMAN

Deputy Vice-Chancellor (Research & Innovation)

Universiti Teknologi MARA

MESSAGE

FROM THE CHIEF EDITOR



Alhamdulillah.

It gives me great pleasure to see this issue published. We received a massive and impactful submission to feature our UiTM community's research stories. Despite the difficult circumstances, UiTM researchers are proactive in carrying out research activities and events within their respective capacities.

Allow me to express my heartfelt gratitude to all of the authors of the articles in this magazine. The publication of this issue would have been far more difficult to achieve without their contributions. Here, we feature Assoc. Prof. Dr Hanafiah Yussof of the College of Engineering's beautiful journey into robotic technology. I believe that robotics has always been on the national agenda for its true mission in helping people. We chose to focus on robotics to honour a UiTM researcher who has dedicated his academic

career to assisting society through technological advancements. To all researchers out there, we hope that his inspiring journey will rekindle our enthusiasm for research.

The inaugural issue of the RISE magazine also features research achievements and the multidisciplinary research areas in UiTM which support national priorities. Research Nexus UiTM (ReNeU) celebrates its first anniversary in 2021, marking a major milestone in its journey. Faculty of Pharmacy is making a global impact towards producing young aspiring neuroscientists. The exploration of Lembah Benua has highlighted the wonderful forest as a potential research station. The potential of fine art logistic industry is also of utmost importance towards making Malaysia as a top art market hub. These are some of the exciting research stories and I invite you to discover more in this issue.

We sincerely hope to bring you more research news from the UiTM family in the coming issues. Have fun reading!

DR MOHD MUZAMIR MAHAT

Head of Research Communication & Visibility Unit (UKPV)

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EDITORIAL TEAM

Chief Editor

Dr Mohd Muzamir Mahat

Editors

Nur Syazwani Ahamad Azahari (Statistics & Information)

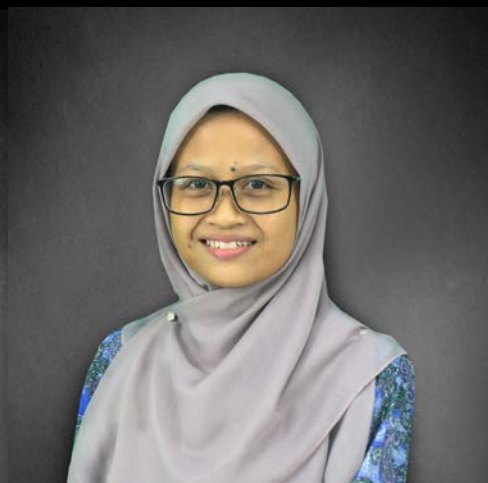
Nazarul Wirda Baharuddin (Content)

Ts. Dr Judith Gisip (Guest Editor)

Designers

Muhammad Ammar Khaizuan

Mohd Aizuddin Borhan Shah



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“

Collaboration between NEXTGREEN Global and UiTM will strengthen UiTM cooperation with public listed company in zero waste technology and renewable energy for sustainable development



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Hutan Simpan Lembah Benum Exploration 2021

Drone and Precision Agriculture Technology for Pineapple Plantation

by Dr Muhammad Asraf Hairuddin



A research team, led by Dr Muhammad Asraf Hairuddin from the Faculty of Electrical Engineering at Universiti Teknologi MARA (UiTM) Kampus Pasir Gudang has developed an innovative solution to yield counting for pineapple fruits using drone technology. They use this drone technology to capture photos of their estate and then use relevant software to quantify the number of pineapple fruits in the southern region of Malaysia. The invention involves image processing and artificial intelligence on yield mapping, field monitoring, and fruit harvesting systems. Moving towards the future of farming, precision agriculture technologies have enormous potential to assist in decision making, increase productivity, and cost-efficiency.

The research team introduces new technologies to farmers, helping them solve labour shortages and yield estimation issues. As a solution to these problems, especially in large plantations, drones in the agriculture sector are still in their early stages, and more significant efforts must be made to educate and promote the concept among stakeholders.

This application is not limited to implementing specific technology for usage at all crop phases, including planting, growing, and harvesting, to compensate for a dwindling availability of field labour in the agricultural industry. More sustainable farming and less dependency on physical labour for particular jobs are both parts of the process of modernization in the agriculture sector, as is the usage of drone technology.

In order to ensure the long-term viability of Malaysia's agriculture sector, the decisions made in the next 5–10 years about the adoption of new technology and the transition away from a reliance on heavy manual labour will be crucial. Choosing and using precision farming tools and technologies requires an enhanced appreciation and understanding of science and fact-based decision making. This is why it is essential to bring new capabilities and skills in precision agriculture technologies into the future farm.

The UiTM team will continue to enhance the monitoring and mapping efficiency, hoping that in the future, more agricultural technologies can be accessed by farmers' mobile phones or web-based applications, thus enabling a better estate operation and sustainable farming.

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*Source: PLoS Biol 18(10): e3000918. <https://doi.org/10.1371/journal.pbio.3000918>

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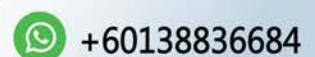
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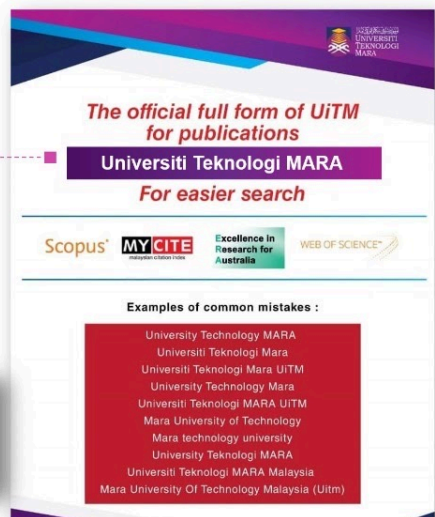
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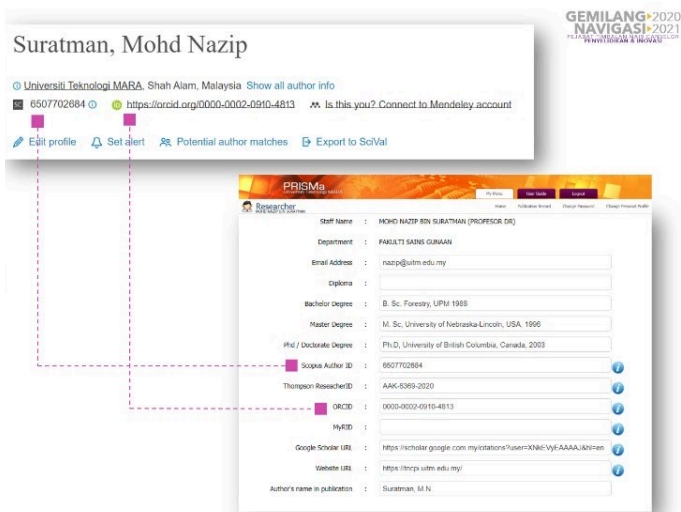
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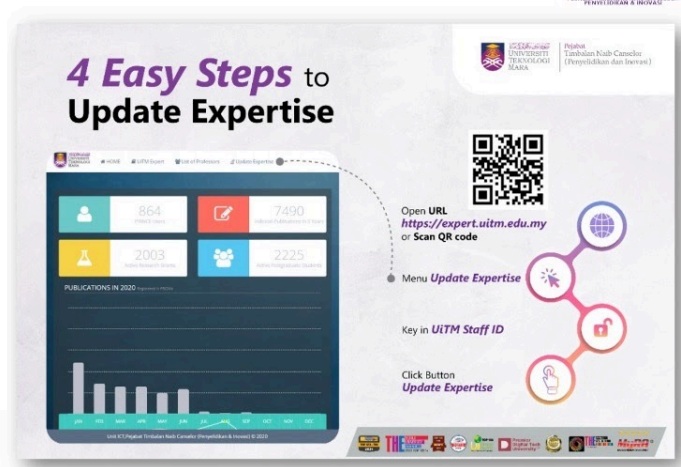
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Robotics Technology: Driving Innovation, Transforming Future

Dr Mohd Muzamir Mahat

Research Communication & Visibility Unit (UKPV)
Hutan Simpan Lembah Benum Exploration

Dr Muhammad Asraf Hairuddin

School of Electrical Engineering, College of Engineering UiTM,
Campus Pasir Gudang, Johor
Drone and Precision Agriculture Technology for Pineapple Plantation

Dr Nur Azfahani Ahmad

Faculty of Architecture, Planning & Surveying UiTM,
Campus Sri Iskandar, Perak
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Dr Siti Rasidah Md Sakip

Faculty of Applied Sciences, UiTM Shah Alam
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**Prof. Dr Kalavathy Ramasamy, Assoc. Prof. Dr Lim Siong Meng,
Dr Faezah Sabirin & Nur Syakila Rohawi**
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Director Research Management Centre (RMC)
Faculty of Pharmacy, UiTM Campus Puncak Alam

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Dr Shahril Anuar Bahari

Business Innovation & Technology Commercialization Centre (BITCOM)
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