



EXTENDED ABSTRACT



InViCCAD 2025
1ST INTERNATIONAL VIRTUAL COMPETITION OF CREATIVE
ARTS & INNOVATIVE DESIGN IN TEACHING & LEARNING



Design Innovation Academic Show 2025



Organized by



Fakulti
Seni Lukis & Seni Reka
Cawangan Kedah



اوسها تقوى موليا

Collaboration with



#perubahanluarbiasa
#ADpilihanpertama



**EXTENDED
ABSTRACT**

**Design
Innovation
Academic
Show 2025**





DIAS 2025 (Design Innovation Academic Show) is all about "Transcending the Boundaries of Creativity: Innovation in Art & Design for 21st Century Education." This vibrant program shines a spotlight on how creativity and innovation are reshaping modern education.

It consists of three key components. First up is the Mindareka Design Show, an exhibition that showcases students' final year projects and creative designs, giving them a chance to connect with industry professionals and the wider community. Next, we have the Northern Innovation Academic Tour (NIAT), which takes participants on an academic adventure to select institutions and innovation centers in the northern region, aimed at promoting knowledge sharing and building strong academic and professional networks.

Finally, there's the 1st International Virtual Competition of Creative Arts & Innovative Design in Teaching & Learning (InViCCAID), a global competition that recognizes outstanding practices in teaching and learning by blending art, technology, and innovative design. But DIAS 2025 is more than just a talent showcase; it's a powerful platform for empowering both students and educators, while also strengthening collaborations between universities, creative industries, and global communities. With its inclusive and interdisciplinary approach, this initiative strives to spark relevant, competitive, and impactful ideas and innovations that truly benefit society and push the future of education forward.



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Design
Innovation
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Prof. Dr. Roshima Haji Said
Acting Rector
UiTM Kedah Branch

Rector's Message

I am delighted to extend my heartfelt congratulations to the College of Creative Arts, UiTM Kedah Branch, for bringing MINDAREKA 2024 - Unleashing Your Visual Creativity to fruition. The triumphs of past MINDAREKA editions undoubtedly fueled the organization of this year's event, making MINDAREKA 2024 a reality.

MINDAREKA 2024 - Unleashing Your Visual Creativity stands as a testament to the dedication of students at the College of Creative Arts, UiTM Kedah Branch, providing them with a platform to showcase their final art projects. Beyond serving as a space for the exploration of fresh, innovative, and entrepreneurial concepts, this exhibition is poised to connect aspiring talents with potential clients and employers.

I extend my sincere gratitude to all participants whose enthusiasm and support have contributed to the success of MINDAREKA 2024 - Unleashing Your Visual Creativity. Their unwavering belief and commitment have truly brought this event to life, marking it as a resounding triumph!





Head of Faculty Message

It is an honour to introduce DIAS 2025 – Design Innovation Academic Show, held under the theme “Transcending the Boundaries of Creativity: Innovation in Art & Design for 21st-Century Education.” This significant event reflects the faculty’s ongoing commitment to fostering a culture of innovation, critical thinking, and creative exploration among our students and academic community. As we navigate the complexities of the 21st century, it becomes increasingly clear that education must go beyond traditional boundaries to embrace multidisciplinary approaches that are both relevant and future-forward.

The three core components of DIAS 2025, Mindareka Design Show, Northern Innovation Academic Tour (NIAT), and the 1st International Virtual Competition of Creative Arts & Innovative Design in Teaching & Learning (InViCCAID) which is serve as vital platforms to highlight the convergence of design, technology, and pedagogy. These initiatives not only empower our students to showcase their talents and ideas, but also create opportunities for engagement with industry leaders, academic peers, and global collaborators. The Mindareka Design Show celebrates student creativity and innovation through compelling final year projects. NIAT fosters knowledge sharing and institutional partnerships through academic visits and exchanges, while InViCCAID offers international recognition for excellence in integrating art and design into teaching and learning.

I would like to express my deepest appreciation to the organising committee, faculty members, students, and strategic partners who have worked tirelessly to bring this programme to life. Your dedication and collaborative spirit have made DIAS 2025 a reality and a reflection of our shared vision for transformative education. It is my hope that this platform will continue to inspire meaningful dialogue, cultivate groundbreaking ideas, and spark a new wave of innovation that enriches both education and society.



Mohamat Najib Mat Noor
Head of Faculty
Faculty of Arts & Design
UiTM Kedah Branch





**Industrial
Design
(Bachelor)**





agriX | TRACTOR

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ABSTRACT

AgriX is an innovative autonomous tractor crafted to meet the unique challenges of paddy farming in Malaysia. Traditional tractors often find it tough to navigate through wet and muddy fields, which can lead to soil compaction, inefficiencies, and a heavier reliance on labor. To gain insights into farmers' needs and their views on adopting new technologies, a quantitative study was carried out using questionnaires sent to paddy farmers in Kedah. The findings revealed that fertilizer application and pest management are the most time-consuming aspects of rice farming. A notable 78% of respondents showed interest in autonomous machinery, while 82% were already familiar with agricultural technologies, signaling a readiness for innovation in the industry. In response to these insights, AgriX was designed with a lightweight, aerodynamic build, an advanced traction system, and a unique adjustable tire feature that allows it to adapt to different field conditions. Its autonomous functions are aimed at minimizing human intervention, boosting productivity, and promoting sustainable practices in paddy farming. Moreover, the integration of precision agriculture technologies like GPS navigation and IoT-based crop monitoring has been suggested to further enhance its capabilities. The study concludes that AgriX holds significant promise for improving operational efficiency and alleviating labor challenges in paddy farming. Future developments should prioritize user-friendly controls and affordability to ensure that small and medium-scale farmers can easily access this technology.



Keywords: Tractor, Autonomous tractor, Precision agriculture, Paddy field innovation, Smart farming technology

INTRODUCTION

In modern agriculture, machinery is essential for increasing productivity and addressing labor shortages. However, traditional tractors struggle in wet, muddy paddy fields, often causing soil compaction that affects crop yields (Oladoyin & Onwuakpa, 2020). The growing demand for rice also highlights the need for more efficient and sustainable farming practices (Arunrat et al., 2022). Precision agriculture technologies, such as autonomous vehicles and smart systems, have proven to improve field operations and reduce human dependency (Shamshiri et al., 2018).

AgriX is designed as a high-tech autonomous tractor specifically for paddy fields. Its lightweight, aerodynamic design and advanced traction system reduce soil impact while enabling efficient operation in challenging terrains. This project aims to introduce an innovative solution that supports sustainable rice farming and aligns with the future of precision agriculture.

METHODS

This project adopted a quantitative research approach using a structured questionnaire to gather insights from paddy farmers. The questionnaire aimed to identify challenges in rice farming, farmers' familiarity with agricultural technology, and their interest in innovative solutions. It included closed-ended and Likert-scale questions focusing on fertilizer application, pest control, and perceptions of automation. Respondents were selected from paddy farming communities in Kedah using purposive sampling.

The results indicate a strong interest in designing a smart agricultural tractor like AgriX to support paddy farming. The most significant challenge identified is the time-consuming process of fertilizer application, highlighting the need for automation. Farmers currently use various methods for pest control, but many see the potential of AgriX in improving efficiency. Most respondents are aware



of agricultural machinery technology, with a majority expressing interest in using autonomous tractors for fertilizer and pest management, reinforcing demand for fully automated solutions.

RESULTS AND DISCUSSION/FINDINGS

The questionnaire responses provided valuable insights into the challenges faced by paddy farmers and their perspectives on adopting autonomous machinery. Most respondents (78%) identified fertilizer application as the most time-consuming task in paddy farming, followed by pest control (65%). When asked about current practices, farmers reported using traditional manual methods combined with small machinery, but many acknowledged inefficiencies in these approaches.

Notably, 82% of respondents expressed awareness of smart agricultural technologies, and 74% showed strong interest in using autonomous tractors like AgriX for fertilizer application and pest monitoring. Autonomous systems were preferred over semi-automated solutions, indicating farmers' readiness for fully automated technologies. These findings directly informed the design of AgriX as a lightweight, autonomous tractor capable of improving productivity and reducing labor dependency in paddy fields.

CONCLUSION & RECOMMENDATION

The findings highlight a strong interest among paddy farmers in adopting autonomous machinery like AgriX. Fertilizer application and pest management were identified as key challenges, reinforcing the need for efficient, automated solutions. AgriX addresses these issues with its lightweight design, advanced traction, and autonomous system tailored for paddy fields.

It is recommended to further develop AgriX by integrating precision farming technologies such as GPS guidance, IoT sensors, and AI-based crop monitoring. Future design iterations should also consider affordability and ease of use to ensure wider adoption among small to medium-scale farmers in Malaysia.

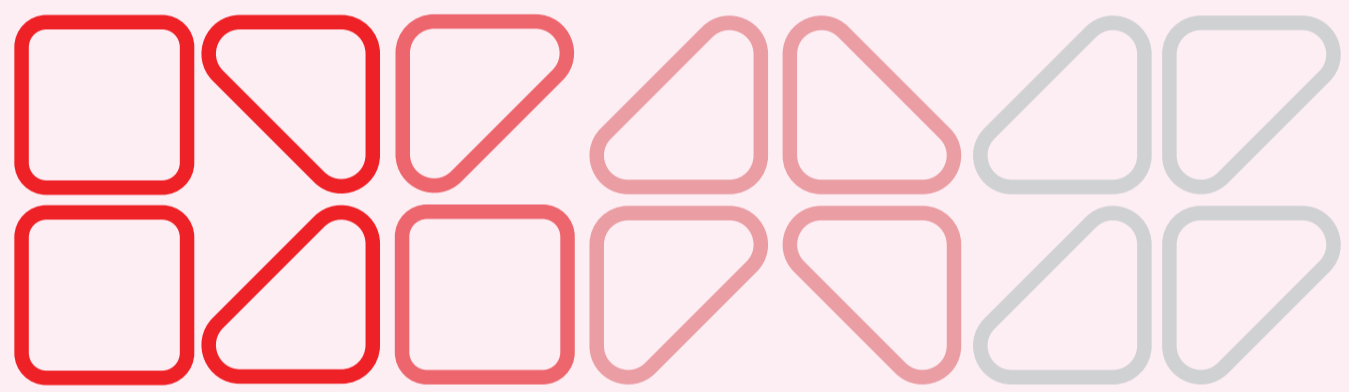


Figure 1.1 Environment of tractor

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DMS



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