

MELAKA  
INTERNATIONAL  
INTELLECTUAL EXPOSITION

# MIIEX'24

12 JUNE '24

Dewan Taming Sari,  
Universiti Teknologi MARA Caw. Melaka,  
Kampus Alor Gajah, Melaka

*"Empowerment of Special  
Needs through Invention  
& Innovation"*

**EXTENDED  
ABSTRACT**

# MiiEX'2024

**MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024**

**“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND  
INNOVATION”**

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UiTM Cawangan Melaka

KM26 Jalan Lendu,

78000 Alor Gajah

Melaka Bandaraya Bersejarah

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# MiiEX'2024

**MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024**

**“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND  
INNOVATION”**

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## **FOREWORD BY THE RECTOR OF UiTM CAWANGAN MELAKA**



**Professor Ts. Dr. Mohd Rasdi bin Zaidi**

**Rector, Universiti Teknologi MARA (UiTM)**

**Cawangan Melaka**

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honour for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

2024 is a special year where MIIEX 2024 emphasizes the development of special needs. As we know, special needs indicate a limitation in a person's ability to engage in and benefit from various aspects, such as daily activities and education. Hence, with the theme "Empowering Special Needs Through Invention and Innovation," it is a platform for industries, professionals, academicians, students, and communities to share their innovative ideas and products to increase accessibility for those with special needs.

The successful implementation of MIIEX '24 is our joint success. This event was supported by the Melaka state government through YB Datuk Fairul Nizam bin Roslan, the EXCO of Science, Technology, Innovation, and Digital Communication. I also want to express my

gratitude to Universitas Negeri Padang, Indonesia, Universitas Muhammadiyah, Makassar, Indonesia, the International Association of Economic and Businesses (IAEB), Universiti Sains Islam Malaysia, Ibnu Umami Maktum Research Center (UMMI), USIM, and The Southeast Asia Minister of Education Organization Regional Centre for Special Educational Needs (SEAMEO SEN) as our co-collaborators for MIIEX 2024.

The collaboration from various parties in MIIEX '24 is a platform that will improve cooperation and interweaving among industries, professionals, academicians, students, and communities in shaping their potential in developing innovation products. This exposition also serves as a platform to cultivate and uphold the nation's innovation culture by presenting new ideas and research by young people, especially from academia and universities. Indirectly, MIIEX '24 will encourage all inventors towards empowering Science, Technology, Engineering, and Mathematics (STEM), especially in primary and secondary schools.

The new digital landscape also inspires more innovation and new ideas that contribute to various activities, such as business and industries. As a university that encourages "Research and Innovation," we aim to foster more innovative products that benefit scholars, industries, and communities, addressing issues to improve our present and future life.

This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams, who are the backbone of this exposition. Their hard work, effort, and time made this exposition possible.

Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

## **FOREWORD BY THE DEPUTY RECTOR (RESEARCH & INDUSTRIAL LINKAGES)**



**Associate Professor. Dr. Nur Hayati binti Abd Rahman**

**Deputy Rector (Research & Industrial Linkages), Universiti Teknologi MARA (UiTM) Cawangan Melaka**

With much passion and privilege, let me warmly welcome all of you to the Melaka International Innovation Exhibition (MIIEX), UiTM Cawangan Melaka's flagship event. I firmly believe that events such as these demonstrate the gradual evolution of this platform in terms of its significance and its governing principles within the sphere of learning and the broader scholarly society.

The theme for this year, "Empowering Special Needs Through Invention and Innovation," strongly connects to our mission of using research and technology to make a positive impact on the world we live in. Besides enforcing the message of diversity, this theme also reaffirms our focus on creating products to improve the lives of people with disabilities (PWDs). Such innovations are vital as only through focused constructive changes can society become more sensitive to the needs of all members.

MIIEX allows researchers, students, and industry professionals to come together, share their innovative research, and develop viable research partnerships. It has been great to see the enthusiasm of the participants and the efforts they put into their projects, which can offer various social and economic benefits. This is why one can state that MIIEX is a great

opportunity for creating connections between the academic environment and industry, facilitating the implementation of innovative and promising projects.

Finally, I would like to express my sincere appreciation to all the members and supporters of the organizing committee, all the participants, sponsors, and everyone involved in preparing this event. I want to express my gratitude for your commitment and involvement, as the success of MIIEX and the development of an active culture of innovation in our university and beyond is partly owed to your support.

Thank you



## **FOREWORD BY THE PROJECT DIRECTOR**



**Dr Zulkefli bin Muhamad Hanapiyah**

**Senior Lecturer**

Assalamualaikum and Warmest Greetings,

It gives me a great pleasure, on behalf of the organizing committee, to welcome all participants and speakers to the Melaka International Intellectual Exposition 2024 (MIIEX '24) with the theme "Empowering Special Needs Through Invention and Innovation." We are honoured and pleased to welcome all participants to this biennial event.

MIIEX '24 is a platform that gathers experts from local and international industries, academia, scientists, researchers, and the community to contribute to the advancement of scientific and technological knowledge. This knowledge helps develop disruptive innovation products that improve daily activities for businesses and the community, especially those with special needs.

MIIEX '24 provides an atmosphere for inventors of all levels to gain new exposure and collaborate. Indirectly, this promotes a collaborative and innovative culture that focuses on cutting-edge technologies and new standards in technology and creativity.

MIIEX '24 is anticipated to serve as an arena for participants to acquire and disseminate revolutionary information on ideas and innovation. It is intended that the competition will expose the contestants' minds to the latest technologies and designs, aligning with the government's goal of encouraging innovation in Malaysia.

Finally, I want to compliment my fellow committee members on their amazing efforts, which were vital to the event's success. In addition, I want to thank our co-organizers, event sponsors, and participants. Optimistically, we hope that all new knowledge discovered, invented, or innovated will lead us toward future sustainability.

Thank you.

**FOREWORD BY MELAKA STATE EXCO OF SCIENCE, TECHNOLOGY,  
INNOVATION AND DIGITAL COMMUNICATIONS**



**YB Datuk Fairul Nizam bin Roslan**

**Melaka State Exco of Science, Technology, Innovation and Digital Communications**

Welcome to the Melaka International Intellectual Exposition 2024 (MIIEX '24). It is an honor for me, on behalf of UiTM Cawangan Melaka, to thank all of you for joining MIIEX '24. We are proud to inform you that this is the 13th consecutive year that UiTM Cawangan Melaka is organizing this exposition. Since 2009, UiTM Cawangan Melaka has successfully hosted this innovation exposition. Not only have we succeeded in organizing the exposition, but we have also successfully embarked on commercialized products.

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This exposition would never happen without dedication, teamwork, and commitment. A round of applause should be given to the committee teams, who are the backbone of this exposition. Their hard work, effort, and time made this exposition possible.

Finally, I would like to conclude this brief remark by thanking all the participants and stakeholders for joining the exposition. We hope that this collaboration never ends here.

Thank you.

## MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	RIDZUAN ADLI BIN AZIDIN
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	PN AFZAN NOR BINTI TALIB
	PN NUR HIDAYAH ZAINI
	CIK FARIHA AIZA BINTI RAMLY
	PN NURUL AIN BINTI MUSTAKIM
	PN NOORZALYLA MOKHTAR
	PN ZATUL HIMMAH BINTI ABDUL KARIM
	CIK MUNA KAMEELAH BINTI SAUID
	PN NOR MASLIA RASLI SAMUDIN
	PN NURHAFIZAH MOHD ZOLKAPLI
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	SITI NURSYAHIRA ZAINUDIN
	BUSHRA ABDUL HALIM
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	MUHAMMAD FURQAN BIN AZHAR
	KHAIRUL AZHAR BIN LOCHMAN



## **ABOUT MIIEX'24**

MIIEX'24 is an innovation competition annually organised by UiTM Melaka with the intention to bring together ideas and inspiration that could fit in for commercialization needs.

This event creates a platform for researchers to establish networking, partnership and opportunities to collaborate with industries.

## **OBJECTIVES**

1. Encourage and instil passion towards inventing and innovating among UiTM Cawangan Melaka staff, students and academicians of local and international higher education institutions;
2. Highlight distinguished talents of skilful inventors and exhibit intellectual products, inventions and innovations among local and private tertiary institutions, government and private agencies, including international participants;
3. Become an effective Business Matching platform for participating research products, matching industries and partnering government agencies;
4. Recognise, inspire and promote invention and innovation products to be patented and commercialized;
5. Increase passion towards inventing and innovating through research and boost interests of government and non-government agencies to obtain consultancy services from a line up experts of higher education institutions and UiTM Cawangan Melaka.

## **THEME**

**'EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND INNOVATION'**

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<b>SALACHOLESTA (OBAT HERBAL KOLESTROL DARI KULIT SALAK) SEBAGAI UPAYA MENINGKATKAN KESEHATAN DAN PEREKONOMIAN DI KOTA PADANGSIDIMPUAN</b>	<b>1429</b>

## **Flexiwheel**

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### **Abstracts**

The ability of an individual to intentionally move around the surroundings is known as mobility. Mobility restrictions have a variety of negative effects on an individual's health and wellbeing, one of which being an increased chance of disability. To achieve movement, a person with a mobility disability requires assistive technology such as a wheelchair. Introducing the innovation of FLEXIWHEEL, an electric wheelchair with the touch of Artificial Intelligence (AI) technology. The creative use of AI assisting the mobility issues faced by people with disabilities. When navigating different terrain, people with mobility disabilities frequently run across problems like uneven surfaces and steep inclines. Conventional wheelchairs may find it difficult to adjust to these environmental difficulties. However, with the help of AI-powered electric wheelchairs (FLEXIWHEEL) with an adjustable platform will provide a viable way to improve user's independence and accessibility as well as allowing the options for the user and caregiver to control. Furthermore, this FLEXIWHEEL can customize its navigation system to maximize comfort, safety, and efficiency for every user such as voice commands and touch sensitive controls. In conclusion, with the era of Artificial Intelligence, it is suitable if it is used to help people with disabilities to maximize their shortcomings to the best of our ability rather than misusing it.

**Keywords: Electric wheelchairs, mobility impairment, artificial intelligence, advanced technology.**

## **1. INTRODUCTION**

An automatic wheelchair or well known as an electric wheelchair is designed for people with mobility disability to enjoy the feeling of independence and freedom as well as assists them to create an active lifestyle. Aligned with this FLEXIWHEEL innovation, it was created as an improvisation from an electric wheelchair, making it more tailored to the world's most advanced technology of the 21st century, the artificial intelligence (AI). There are pros and cons regarding artificial intelligence, but the study believes the technology that can mimic certain aspects of a human cognition and behavior is the most suitable companion for people with mobility disability to free themselves from the shackles of negative feelings and stigmas surrounding people with mobility disability. (Scott, 2024)

## **2. OBJECTIVE**

The main objective of this product is to ensure user safety. Since user safety is utmost priority, this product is going to only utilize top-notch equipment. Making sure users are comfortable comes next. This product will incorporate features into the wheelchair's design to make it more user-friendly and comfortable. For instance, by using this innovation, it allows a user or a reliable person to control the wheelchair in the unlikely event of an accident. The final step is to guarantee user accessibility by making sure it can help users to minimize the user's effort when controlling the wheelchair. For instance, we developed this solution to automate the platform and let disabled people move around when there isn't a path available to them.

## **3. NOVELTY & INVENTIVENESS**

These FLEXIWHEELs are designed to navigate various terrains, including stairs, sand, gravel, snow, and road and allow users to explore outdoor environments with ease. Hence, our FLEXIWHEEL equipped with sensors and smart controls that can be operated through voice commands, smartphone apps, and gesture control technology enable users to control their movements using simple hand gestures. This feature provides a more intuitive and hands-free experience.

#### **4. PRACTICALITY & USEFULNESS**

Introducing FLEXIWHEEL, an automobile with modern sensors that can easily negotiate uneven surfaces and barriers to keep users safe that has the same basic function as a normal wheelchair found on the market with new key features. A manual wheelchair is powered either by the individual using the wheelchair or by an assistant. Hospitals and nursing homes are the locations where manual wheelchairs are most commonly seen, but FLEXIWHEEL offers extra safety measures with the option for user or caregiver control. Additionally, smart controls, a user-friendly navigation tool, enable users to receive real-time updates on potential obstacles. Based on its intended function and design, manual wheelchairs can be categorized into a number of different groups. Technological innovations such as FLEXIWHEEL not only promote variety and a sense of security and independence within society, but they also make the environment more accessible and supportive for all people, regardless of their ability. (DiGiovine, 2024)

#### **5. CONCLUSION**

Wheelchair use is increasing for a number of reasons as the population ages and society gets older. The goal of this well-liked and secure mobility aid is to give the user comfort, independence, and the capacity to fully enjoy life. The FLEXIWHEEL is an incredibly creative electric wheelchair that gives those with mobility impairments a stronger sense of freedom and independence. This device incorporates elements like a remote control and user-friendly navigation since it stresses the safety and comfort of the user. Its sophisticated features, which include the ability to navigate different types of terrain and react to voice instructions and gestures, also make it a practical and helpful option for people who need aid with movement. All things considered, the FLEXIWHEEL encourages independence and inclusivity by making it easier for people with disabilities to travel through areas with poor infrastructure. (Soh, 2016)

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