

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

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78000 Alor Gajah

Melaka Bandaraya Bersejarah

Website: <https://vmiex.uitm.edu.my/>

MiiEX'2024

MELAKA INTERNATIONAL INTELLECTUAL EXPOSITION 2024

“EMPOWERMENT OF SPECIAL NEEDS THROUGH INVENTION AND
INNOVATION”

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PUBLISHED BY:

UiTM Cawangan Melaka

KM26 Jalan Lendu,

78000 Alor Gajah

Melaka Bandaraya Bersejarah

Tel: +606-5582094 / 2190 / 2113

eISBN: 978-967-2846-81-9

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INNOVATION, INVENTION, AND DESIGN

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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Thank you.

MIIEX'24 ORGANISING COMMITTEE

COMMITTEE	NAME
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	DR NORASHIKIN ADAM
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	AFZAN SAHILLA BINTI MOHD AMIR HAMZAH
	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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Sneaksense Sensory Shoe

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Abstract

Sensory shoes are a game-changing innovation that aims to improve mobility and safety for people with vision impairments, particularly the blind. These wearable gadgets, built with advanced sensors and haptic feedback systems, deliver real-time environmental feedback through tactile impulses and audible signals. The sensory shoes detect obstacles and changes in the environment within a 2-meter range and provide discrete sound signals to inform users to diverse terrains and hazards, boosting situational awareness and promoting confident navigation. The shoes have an intuitive proximity-based volume control that modifies sound intensity as users approach barriers, resulting in increased awareness and adaptability. Sensory shoes are designed to be comfortable, convenient, and stylish, while also responding to a wide range of needs and preferences. With a concentrate on fostering independence and inclusion, these innovative shoes provide a dependable tool for navigating daily activities securely and effectively. Sensory shoes, which embraces assistive technology principles, seeks to bridge the gap between people with visual impairments and their surroundings, enabling autonomy, confidence, and a higher quality of life. Therefore, sensory shoes not only help users navigate complex situations, but also allow them to participate more completely in social interactions and everyday activities. This innovative footwear technology represents a substantial advancement in assistive solutions, highlighting the potential to transform lives and increase accessibility for all.

Keywords: Sensory shoes, Assistive technology, Visual impairment, Safety, and Social inclusion

INTRODUCTION

Individuals who are blind or visually impaired may find it difficult to navigate daily life without the necessary aid. While traditional equipment such as canes and guide dogs provide assistance, they frequently lack real-time feedback and specific information about the surroundings. Sensory shoes are intended to address these issues directly. These unique wearable solutions are outfitted with sensors and haptic feedback systems that deliver instant feedback via tactile impulses. Sensory shoes let blind people travel securely and confidently by detecting barriers and changes in their surroundings, thereby increasing their mobility and independence. This ground-breaking technology promises to close the gap between the visually impaired community and their surroundings by providing a more intuitive and effective way of exploring the environment.

OBJECTIVE

The aim of sensory shoes for blind people or visually impaired specifically is to enhance their mobility and independence. These shoes could incorporate sensors and technologies to provide real-time feedback to the wearer to prevent accidents and promote a safer environment, such as vibration or audio cues, to help them navigate their surroundings more effectively and safely. Furthermore, these sensory shoes could improve the overall quality of life for blind individuals by providing them with a reliable and intuitive tool for mobility. By incorporating advanced technologies, the shoes should empower blind individuals to explore and move around independently, reducing their reliance on assistance from others. At the same time, these shoes aim to create shoes that are stylish, comfortable, and socially acceptable, ensuring they feel confident and included in various social settings.

3. NOVELTY & INVENTIVENESS

Introducing our revolutionary shoe innovation: the SneakeSense shoe, carefully designed to improve user safety and mobility like never before. At its core lies a sophisticated sensory system, seamlessly integrated into the shoe's design, poised to redefine the way we navigate our environment. The foundation of this breakthrough technology is a built-in obstacle detection sensor, finely tuned to detect obstacles within an incredible 2-meters. When detecting an obstacle, whether it's a hill, a steep drop or a watery path, the sensors spring into action,

emitting different auditory signals adapted to the nature of the obstacle. It shows when you're traversing uneven terrain, your SneakSense Shoes emit a subtle "cringing" sound, alerting you to the presence of hollow or uneven surfaces, allowing for quick adjustments and ensuring certainty with every step. When encountering hilly obstacles, the shoe emits a reassuring "beep" to signal the presence of hilly terrain, empowering you to navigate with confidence and calm. But the innovation does not end there. The SneakeSense shoe has an intuitive proximity-based volume control mechanism, dynamically adjusting the intensity of emitted sound as you approach obstacles, providing real-time feedback and increasing situational awareness to an unprecedented level. However, what really sets the SneakeSense Shoe apart is its unparalleled adaptability and convenience. Equipped with an advanced wireless charging system, the sensor seamlessly recharges its battery when it detects a low-power condition, eliminating the need for cumbersome charging cables or access to electrical outlets. Whether you find yourself in the midst of dense forest foliage or embarking on an outdoor adventure far from civilization, SneakSense Shoes ensure uninterrupted functionality, empowering you to explore with unparalleled peace of mind. In conclusion, the SneakeSense Shoe represents a paradigm shift in footwear technology, seamlessly combining innovation with practicality to redefine the boundaries of safety and mobility. With every step, embrace a new sense of confidence and security, knowing that SneakeSense Shoes are always supporting you, every step of the way. It is parallel with the article or research from Moaiad Ahmad Khder et. al (2017) in International Conference on Sustainable Futures ICSF 2017, said that many of visual impairment persons need assistance when travelling in unfamiliar places. Researchers introduce the Smart Shoes initiative, which helps visually impaired people with limited movement avoid hazards. This system uses current robotics technologies to identify obstructions like curbs, underground staircases, and even moving objects. It then sends the obstacle information through haptic feedback, which includes vibrations and beeps.

4. PRACTICALITY & USEFULNESS

This product was designed for person with special needs and will help them to detect danger, especially for blind people. Being blind means having no functional eyesight at all. Yet different people experience different degrees of blindness, sometimes in different circumstances. Light beams striking the retina, or back of the eye, allow electrical signals to be sent from the optic nerve to the brain, which is what causes vision. When not enough light

reaches the retina or when the information is not properly transmitted to the brain, blindness results. Our product is designed for those who are completely blind, colourblind, or night blind. This product is an innovative pair of shoes equipped with sensors that identify obstructions and threats in real-time. When danger is recognized, the shoes will produce sound and audio alert that can give consumers timely cautions. With this product features, it can increase safety for the consumer. This product is convenient for person with special needs because it is easy to wear, and the features really helped the person with special needs by detecting the danger. This product also provides a variety of sizes of shoes.

5. CONCLUSION

From the innovative features of shoes equipped with cameras and sensors to identify obstacles and threats, as well as providing audio alerts when danger is detected, we can conclude that these shoes offer additional safety to individuals who are blind or visually impaired by giving them early warnings in hazardous situations. This enhances consumers' awareness of their surroundings and allows them to react quickly to avoid accidents.