

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

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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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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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	BUSHRA ABDUL HALIM
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	SITI NAZIRAH BINTI OMAR
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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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SmartReach

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Abstract

This paper explores the intersection of recent technological advancements and the creation of assistive devices for the visually impaired, focusing on the application of Near Field Communication (NFC) tagging technology. Despite the proliferation of assistive technologies designed to aid individuals with disabilities in performing everyday tasks, there remains a significant gap in the availability of such tools for the visually impaired, often due to prohibitive costs and limited functionality. This study conducts a comprehensive review of current NFC adaptations for the visually impaired and introduces practical NFC-based applications that can help them overcome daily challenges. With a particular emphasis on the Malaysian context, where there is a dearth of assistive tools and adapted environments, this research highlights the potential for affordable NFC-enabled assistive technologies to support visually impaired individuals and facilitate their integration into society. The paper also notes the rapid growth in mobile devices equipped with NFC readers, indicating a promising trend towards greater accessibility in communication technology for the visually impaired. The technologies do assist the disabled person especially blind person which lacks visual in recognizing physical things like clothes and food.

Keywords: Assistive technologies, NFC tag, visually impairment

1. INTRODUCTION

Visual impairment, which can range from low vision to total blindness, is defined as a decrease in the amount of information that the eye is able to get from its surroundings. This reduces the number of experiences that people may have from their surroundings. Complete blindness is the whole inability to see, whereas low vision, often known as visual impairment, is a significant loss of vision that is not treatable with glasses or contact lenses. The World Health Organization estimates that in June 2012, there were about 285 million people worldwide who

suffered from vision impairments, of whom 39 million were blind. Additionally, emerging nations are home to 90% of the world's visually handicapped population. Recent advances in technology can offer patients technical support to help them with daily duties, enhance their quality of life, and enable such a vast population to seamlessly integrate into society. The NFC tag was created expressly to enable people who are blind or visually impaired to distinguish colors on clothing items, such shirts, with unmatched precision and effectiveness. With the help of a carefully constructed database of color identifiers and state-of-the-art Near Field Communication (NFC) technology, our NFC tag can reliably and instantly transmit color information at the touch of a finger. Subtle tags that are woven into clothing are a subtle way to provide users with easy access to guidance so they can confidently and independently identify and coordinate their wardrobe choices. This innovative solution ensures that those with visual impairments can fully engage in the joys of fashion and self-expression while also enhancing accessibility and fostering inclusivity.

2. OBJECTIVE

Our NFC tag main objective is to enable people with vision impairments to recognize the colors of clothing, especially blouses, with accuracy. This will help them live more independently, confidently, and inclusively every day. Our product seeks to give users instant and dependable color information by fusing state-of-the-art NFC technology with an extensive database of color identifiers. This will allow users to fully engage in the world of fashion and self-expression and make informed wardrobe decisions. Our goal is to improve the lives of those who are visually impaired by making the world more accessible and inclusive so they can move around more easily and independently.

3. NOVELTY & INVENTIVENESS

The invention of an NFC chip that enables blind people to discern colors is a notable technological breakthrough that promotes inclusivity. This chip caters to the specific needs of the visually impaired, facilitating a more accessible and independent shopping experience especially for person who faced blindness. Its unique application in conveying color information through NFC is both creative and functional. The chip's integration into retail could be transformative for blind shoppers, providing a discreet and straightforward means to

access color details thus recognizing the price, size and product information. Compatible with smartphones or dedicated devices, it translates colors into audio or tactile signals, simplifying comprehension for blind individuals. This innovation has potential uses beyond shopping, such as in education and the arts, demonstrating its adaptability and forward-thinking design. Overall, this NFC chip represents a significant stride towards inclusive technology with wide-ranging positive societal impacts.

4. PRACTICALITY & USEFULNESS

The innovative NFC chip transforms smartphones into color-detecting tools for the blind, enhancing their autonomy and daily life. It's a straightforward system where users tap their phone against NFC-tagged clothes to identify colors. This chip seamlessly integrates with current smartphones, avoiding the need for extra devices. It boosts the confidence and independence of visually impaired shoppers, allowing them to make informed choices. Initially aimed at retail, its applications could broaden to home and education, aiding color recognition in various settings. The chip's conversion of color to sound or touch feedback makes it a user-friendly aid that could greatly improve life for those with visual impairments.

5. CONCLUSION

In conclusion, the innovative NFC chip is a significant leap forward in assistive technology, offering a practical solution for the visually impaired to identify colors. This breakthrough fosters inclusivity and independence, allowing blind individuals to shop with confidence and ease. By integrating with smartphones, the chip eliminates the need for additional devices, making it a convenient and accessible tool. Its potential extends beyond retail, promising to enhance various aspects of life for those with visual impairments through its adaptable and user-friendly design. A fundamental issue with NFC (Near Field Communication) tagging systems is that they are not designed with user interaction in mind, particularly because they transmit data only over extremely short ranges (less than 10 centimeters). Consequently, we recognize that there are numerous obstacles that must be addressed, especially for applications intended for individuals with visual impairments.

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