

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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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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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

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| | 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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Color-Reading Glasses

Abstract

The purpose of this innovation project is to design color recognition glasses for people with disabilities such as color blindness. A significant advancement in assistive technology, color-reader glasses are especially beneficial for those who have color vision impairments. These cutting-edge glasses have audio capabilities in addition to sophisticated optics and filtering technologies, giving users immediate input on the colors they see. For persons with different types of color blindness, color-reader glasses improve color perception and help with color recognition by filtering out certain light wavelengths and using aural cues. With this dual feature, users may check the colors they perceive both visually by seeing differences in hue and audibly by hearing them. These glasses enable colorblind people to interact with the environment more completely, whether it's by helping them read traffic signals, enjoy the beauty of a sunset, or navigate color-coded maps. For people who depend on them, color-reader glasses are essential in fostering inclusion and independence since they combine useful support with easily accessible technology. Nevertheless, there are still areas for improvement and possible growth in this project to bring it closer to the goals of the design and construction.

Keywords: Accessibility, Inclusive color vision glasses, , Adaptive tint reading glasses, Assistive technology

1. INTRODUCTION

People who are colorblind may find it difficult to recognize colors because they are unable to accurately perceive particular hues or differentiate between them. Red-green color blindness is the most prevalent type of color blindness, commonly referred to as color vision deficit. People with red-green color blindness have difficulty distinguishing between tones of red and green. This can make it difficult to read maps or charts that use color-coded data, recognize traffic signals, and choose clothes or other items based just on color.

In daily life, the ability to recognize color is not only important for aesthetic purposes but also frequently plays a critical role in comprehending the surroundings. The inability to recognize and distinguish between colors can provide a serious obstacle for those who are colorblind in a variety of situations, from making suitable clothing choices to recognizing traffic signals. However, as technology progresses, color detection glasses emerge as an innovative solution.

These glasses, which have an inbuilt camera and sophisticated algorithms, are able to detect different colors in their surroundings. As soon as the user looks at an object, the glasses instantly determine its hue and give clear, educational voice or visual feedback. This makes it easier for colorblind people to recognize colors and gives them fresh chances to delve deeper into the world of color. In addition to appreciating visual art and the beauty of nature, they can also feel more comfortable in social situations. With the aid of color detection glasses, the divide between the world of color and colorblind people is closing, offering hope for increased inclusivity and more fulfilling lives for all.

2. OBJECTIVE

The main goal of color-reader glasses is to greatly enhance the color perception and recognition skills of those who suffer from color vision deficits, sometimes known as color blindness. These glasses help colorblind people discern between colors that they would otherwise find difficult to perceive precisely by selectively enhancing the contrast between various hues through the use of cutting-edge optical technology and filtering processes. These glasses magnify color variations by selectively filtering particular light wavelengths, enabling wearers to detect a greater spectrum of hues and shades more clearly.

Furthermore, an extra feature of color-reader glasses is the addition of auditory cues, which give users immediate input regarding the colors they see. This aural feedback helps colorblind people recognize and comprehend the colors in their surroundings even more. Color-reader glasses, which combine visual enhancement with auditory reinforcement, provide a full solution to the problems experienced by those with color vision deficits. Ultimately, the purpose of color-reader glasses is to enable colorblind people to interact more thoroughly with the colorful environment around them. Colorblind people may now navigate their environment more easily, confidently, and independently thanks to these glasses, whether they are participating in activities that require color-coded information, recognizing traffic signals, or enjoying the beauty of nature. Color-reader glasses, which combine visual enhancement with auditory reinforcement, provide a full solution to the problems experienced by those with color vision deficits.

3. NOVELTY & INVENTIVENESS

The color-reading glasses are an essential improvement to assistive technology for people who have color blindness, or constraints in color vision. These glasses are unique because they combine advanced visual and processing technology with audio capabilities. This innovative method of addressing color-blind people's problems can be seen through the addition of auditory signals for fast color detection and the use of innovative algorithms to specifically enhance the contrast between different hues. An innovative method to address the gap between colorblind people and environments rich in color as well as increasing independence and inclusivity is to combine visual improvement with auditory stimulation in a wearable device.

4. PRACTICALITY & USEFULNESS

Color-reading glasses provide helpful solutions to concerns that people with color vision problems face every single day. These glasses significantly improve color vision and recognition abilities by filtering specific light wavelengths and offering fast auditory information. Through more interaction with the present world around us, this device not only helps with matters like reading maps, identifying traffic signals, and making outfit selections, but it also allows users to enjoy visual art, the beauty of nature, and interactions with others to the best. Color-reading glasses offer a complete solution that enables colorblind people to explore their surroundings with confidence and independence through the combination of visual enhancement with auditory feedback. This promotes a more inclusive society in the future.

5. CONCLUSION

The utilization of color-reading glasses presents a significant advancement in enhancing the quality of life for individuals with color vision deficiencies or disabilities. Through the integration of innovative technology, these glasses offer a practical solution for overcoming challenges related to color perception. By providing real-time assistance in distinguishing between colors, color-reading glasses empower users to navigate their surroundings with greater ease and confidence.