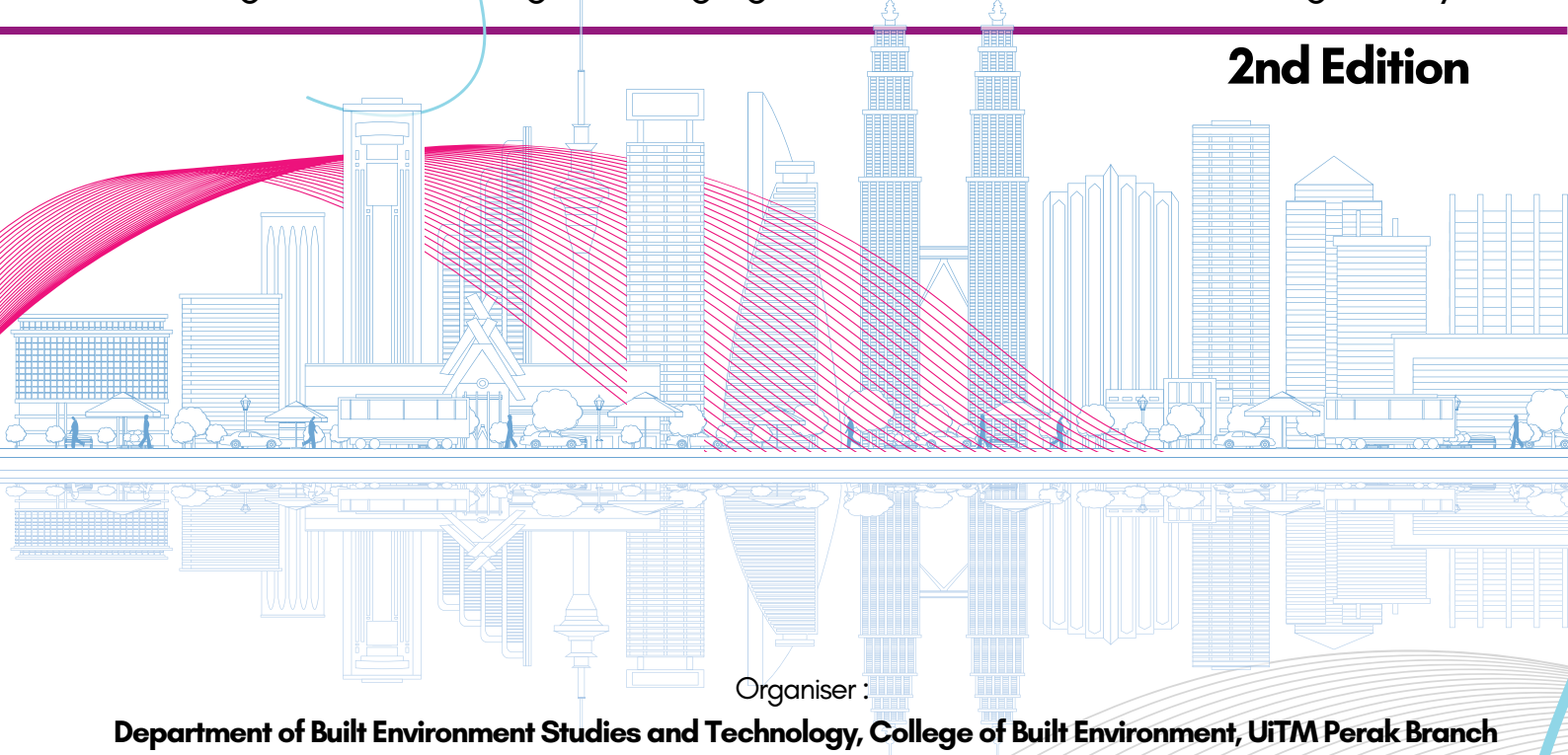# e – Proceedings

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"Undergraduates' Digital Engagement Towards Global Ingenuity"

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NEO-PLANT HOLO: AN INTERACTIVE HOLOGRAPHIC DISPLAY FOR PLANTING EXPLORATION

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Abstract
This study presents the Neo-Plant Holo, an advanced holographic technology that displays interactive, three-dimensional representations of various plant species and their unique characteristics. Due to the rising concern in understanding, managing, and maintaining plants and planting in cities and communities, the plant interactive tools are crucially in demand and desire. Neo-Plant Holo aims to revolutionise how people engage with botanical information by offering an immersive and educational experience. The objectives are to (i) utilise cutting-edge holography, (ii) consolidate a system of lifelike project images of plants, and (iii) enable users to explore intricate details, growth patterns, and ecological significance. This app/system was developed by iNaturalist Apps, Beam Mobility Apps, Google Earth, and Google Maps. Users can access comprehensive data on each plant's specialty, such as medicinal properties, environmental benefits, and optimal growing conditions, by interacting with the holograms. This innovative approach enhances public knowledge about plant biodiversity and promotes environmental awareness and sustainable gardening practices. Neo-Plant Holo represents a significant leap forward in educational technology, combining visual appeal with informative content to foster a deeper connection between people and the natural world towards fostering a feasible, compatible, and SMART plants and planting design for a sustainable future.

Keywords: *holographic education, interactive plant visualisation, sustainable gardening, plant biodiversity, environmental awareness*

1.   INTRODUCTION
This NEO-Plant Holo Technology stimulates green initiatives through innovative smith design, combining NeoLink Holo and MotionLink Mural to engage the community in sustainable cities and community greening practices and environmental education. The extended objectives of this project are to educate the public on green initiatives, engage communities in sustainable urban greening, provide detailed plant information, and continuously update content, enhancing biodiversity knowledge, and promoting sustainable gardening for a deeper connection with the natural world.

(i)   Use dynamic, interactive visual displays to educate the public on the importance of green initiatives and sustainable urban greening.
(ii)   Organise workshops, events, and challenges to motivate community members to participate in planting and maintaining green spaces.
(iii)   Offer detailed information on various plant species, including their ecological benefits, care requirements, and cultural significance.
(iv)   Continuously update the platform with new content and features to reflect the latest in sustainable urban greening practices.

2. PRODUCT DEVELOPMENT

The NEO-Plant Holo was developed to educate the public on green initiatives, engage communities in sustainable urban greening, provide detailed plant information, and continuously update content, enhancing biodiversity knowledge and promoting sustainable gardening for a deeper connection with the natural world. This application consists of four modules: (i) The "Introduction of Independent Study" module provides an overview of the NEO-Plant Holo project, outlining its objectives, technological approach, and expected outcomes. It sets the foundation for understanding the application's goals in enhancing public awareness and promoting sustainable urban greening. (ii) Site Planning & Design Development in NEO-Plant Holo involves creating detailed, interactive holograms of plant species and green spaces, guiding users through the design and planning of urban greening projects. It integrates digital tools for precise site planning and visually demonstrates effective planting strategies and designs. (iii) The Construction & Documentation module provides detailed guidelines for building and recording green space projects, ensuring accurate implementation and thorough documentation of planting designs. It facilitates effective project management, quality control, and future reference by offering structured instructions, standardised documentation practices, and (iv) Portfolios & Design Samples. An example of a product interface is in Figure 1 and Figure 2.

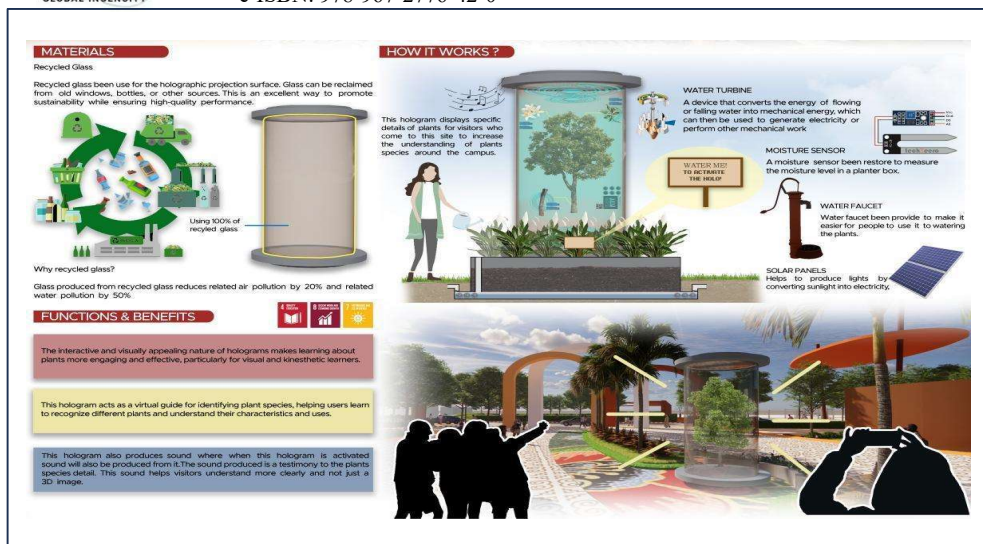Figure 1. Example of the NEO-Plant Holo interface

Figure 2. The Materials and Functions of NEO-Plant Holo Display

The NEO-Plant Holo on Cities and Communities was created using a combination of Digital platforms, including iNaturalist Apps, Beam Mobility Apps, Google Earth, and Google Maps.
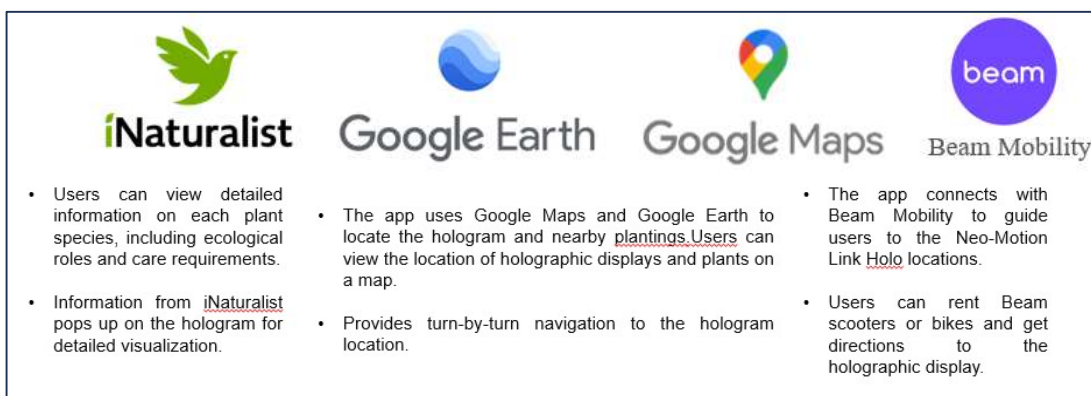

Figure 3. Digital platform tools used in the NEO-Plant Holo applications

Figure 4. Step-by-step of the NEO-Plant Holo applications

3.   PRODUCT ENHANCEMENT

This holographic display provides a platform for students and faculty involved in plant sciences, ecology, and environmental sustainability research. The holograms can visualize data, model ecological systems, and present research findings engagingly. The holograms also help to educate students about the importance of biodiversity, conservation, and sustainable practices. Highlighting the ecological benefits of various plants can inspire students to participate in campus sustainability programs and adopt greener lifestyles.

Figure 5. The Conventional vs. the NEO-Plant Holo Display

This system is sufficient, accessible, convenient, and reliable to everyone, especially the campus users and visitors in the cities and communities. The iNaturalist App is a downloadable application with suitable capacity. It is easy to use, intuitive, manageable, and user-friendly for everyone. Detailed holographic representations can aid gardeners, landscapers, and hobbyists in choosing the right plants for their needs, improving plant care and cultivation success rates. The application displays are shown in Figures 4 and 6.

Figure 6. The NEO-Plant Holo Application display

4.   NOVELTY AND COMMERCIALISATION

Neo-Plant Holo stands out in the market through its state-of-the-art holographic displays. It offers lifelike and interactive representations of plant species that surpass current market standards in resolution, interactivity, and realism. To expand its reach and credibility, the technology will form strategic partnerships with educational institutions, environmental organisations, and technology companies. Collaboration with botanists and horticulturists will ensure the content is accurate and comprehensive, enriching the user experience.

Additionally, users can customize their learning experience by selecting specific plants of interest, tracking their progress, and receiving personalized content tailored to their preferences and interactions.

5. CONCLUSION

The interactive nature of the holograms allows users to delve deeply into the specifics of each plant, from their anatomical features to their ecological roles and benefits. This immersive learning experience makes botanical knowledge more accessible and engaging, fostering a deeper connection to the natural world. By highlighting different plant species' ecological significance and sustainability, NEO-Plant Holo promotes environmental consciousness and encourages sustainable practices among its users. Using cutting-edge holographic technology sets NEO-Plant Holo apart from traditional educational tools, offering a unique and memorable way to present information that can attract and captivate a broad audience. NEO-Plant Holo not only advances educational methodologies through its innovative use of holography but also plays a crucial role in promoting environmental education and awareness.

6. ACKNOWLEDGMENT

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