UNIVERSITI TEKNOLOGI MARA

INTERACTIVE 360° VIRTUAL REALITY CAMPUS TOUR WITH SPATIAL NAVIGATION AND SPEECH RECOGNITION FOR ENHANCED USER IMMERSION

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BACHELOR OF COMPUTER SCIENCE (Hons.)

JULY 2026

SUPERVISOR APPROVAL

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This thesis was prepared under the supervision of the project supervisor, Mr. Abdul Hadi bin Abdul Talip. It was submitted to the Faculty of Computer and Mathematical Sciences and was accepted in partial fulfilment of the requirements for the degree of Bachelor of Computer Science (Hons.)

Approved by

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JULY 11, 2026

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful.

First and foremost, I would like to express my highest gratitude to Allah SWT for granting me the strength, patience, and perseverance to successfully complete this Final Year Project entitled *Interactive 360° Virtual Reality Campus Tour with Spatial Navigation and Speech Recognition for Enhanced User Immersion*.

I would like to extend my sincere appreciation and deepest gratitude to my supervisor in this project, Mr. Abdul Hadi bin Abdul Talip for his constant guidance, valuable advice, constructive feedback, and unwavering support during the planning, development, and completion of this project. His knowledge, encouragement and dedication have been invaluable in helping overcome challenges and successfully accomplish this research.

I also would like to express my sincere gratitude to the lecturer of this subject, Dr. Liew Chin Ying for her guidance, knowledge and constant assistance in the Final Year Project. I would also like to express my sincere gratitude to Miss Juliza binti Salleh for her very valuable help and guidance in the statistical analysis and interpretation of the research results. Their expertise and encouragement have played a great role in the successful completion of this project.

Moreover, I would like to thank all participants who participated in the usability evaluation of the VR application willingly. Their valuable feedback and suggestions greatly contributed to the assessment and improvement of the developed system.

My special thanks are extended to my dear parents, family, and friends for their unwavering love, encouragement, understanding, and moral support during my academic pursuits. Their motivation has encouraged me to stay committed and determined to finish this project.

Finally, I would like to express my gratitude to everyone who has directly or indirectly contributed to the successful completion of this Final Year Project. Many thanks for your help, encouragement, and support.

ABSTRACT

Campus visits are a valuable way for prospective students, newly enrolled students and visitors to learn about a university's facilities, services and learning environment. However, physical visits to the campus are not always possible due to geographical distance, time constraints, financial costs, or accessibility limitations. Current virtual campus tours are limited to interaction and cannot recreate the on-campus experience. To overcome these challenges, this project created an Interactive 360° Virtual Reality Campus Tour with Spatial Navigation and Speech Recognition for Enhanced User Immersion for a local university. The proposed system integrates 360° panoramic images, gaze-based spatial navigation, and speech recognition to provide an interactive, hands-free, and immersive virtual campus exploration experience. The system was developed using the Agile Software Development methodology with Unity 6, Meta XR SDK, and the Meta Quest 3 headset to support interaction and navigation within the virtual environment. The developed system was evaluated with 40 respondents who were allowed to navigate and interact with the virtual campus as they wished with the given navigation and interaction features. After the evaluation the respondents evaluated the system by answering a 5 point Likert scale questionnaire on ease of use, navigation, usability and interaction, usefulness, immersion, user satisfaction and behavioural intention. The Cronbach's Alpha coefficient for the questionnaire was 0.972, which is considered excellent reliability. The evaluation results indicated that the perceptions of the respondents with the system were positive, especially in terms of intuitive navigation, responsive speech interaction, immersive virtual environment, and overall usability. The findings also indicated high levels of user satisfaction and behavioural intention to continue using and recommend the application. The project's main contribution is the integration of 360° panoramic virtual reality, gaze-based navigation, and speech recognition to provide a more engaging and accessible alternative to conventional virtual campus tours. Overall, the developed system has proved that immersive virtual reality technologies can be used for the promotion of campus, increase of visitor interaction, and creating a new virtual platform for remote orientation for higher education institutions.

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