



Faculty of Electrical and Electronic Engineering Technology



**DEVELOPMENT OF AUGMENTED REALITY ZOO FOR
CHILDREN EDUCATION USING UNITY PLATFORM**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

AMIRAH NAKHLIS BINTI OZALI

Bachelor of Electronics Engineering Technology with Honours

2022

**DEVELOPMENT OF AUGMENTED REALITY ZOO FOR CHILDREN
EDUCATION USING UNITY PLATFORM**

AMIRAH NAKHLIS BINTI OZALI

**A project report submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Electronics Engineering Technology with Honours**



Faculty of Electrical and Electronic Engineering Technology

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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**BORANG PENGESAHAN STATUS LAPORAN
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EDUCATION USING UNITY PLATFORM

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I declare that this project report entitled “Development Of Augmented Reality Zoo For Children Education Using Unity Platform” is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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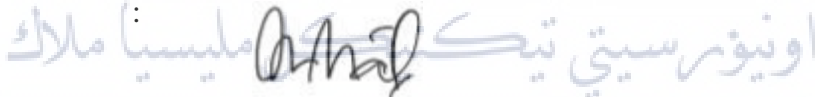
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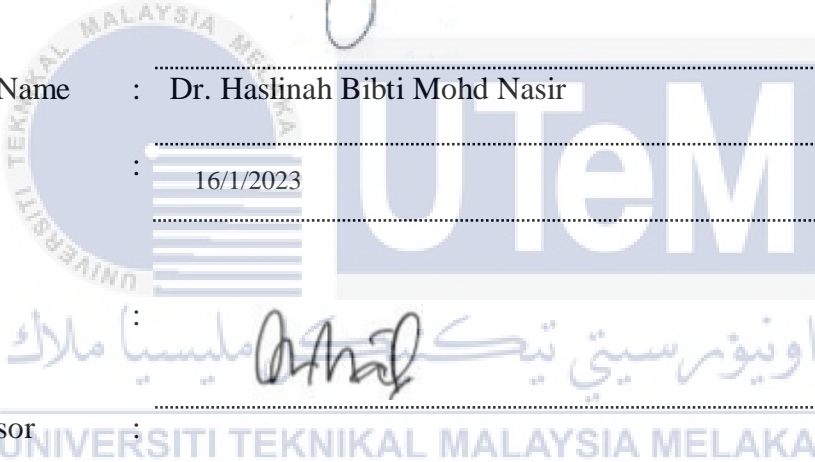
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DEDICATION

I'd want to dedicate this to my dear parents, Ozali Bin Osman and Azura Binti Aziz, who have always been a source of inspiration and strength throughout my life. To my siblings, who have always inspired me to be a better person in the future. Also, not to forget, Dr. Haslinah Binti Mohd Nasir, my humble and kind-hearted supervisor, for her guidance and counsel. Finally, I want to express my gratitude to Allah S.W.T. for His guidance, strength, protection, and long life.



ABSTRACT

The term "augmented reality" refers to a technology that combines two-dimensional and three-dimensional virtual things with the actual world that we are surrounded by. With the power of Augmented Reality to transform the environment of children's learning, it may be utilised as a learning medium in the introduction of animals for children. Nowadays, children are prefer to spent their time playing game compared to learn. This project is to develop augmented reality zoo for children education using unity platform and also to validate the functionality of the application. This project using augmented reality as the method. Augmented Reality can provide interesting facilities such as displaying three-dimensional objects of these animals along with animal sounds and animations using smartphones. This allows children to interact with and be more creative in recognising these animals. The fact that teachers will be able to employ this application as part of their curriculum is one of the anticipated outcomes of this project. The results proves that this application can help children to learn about animals in a fun way. This application can help the teacher to introduce about animals for children. This application will introduce the name, shape, description of the animals even sound of the animal.

ABSTRAK

Istilah "Augmented Reality" merujuk kepada teknologi yang menggabungkan perkara maya dua dimensi dan tiga dimensi dengan dunia sebenar yang kita dikelilingi. Dengan kuasa Augmented Reality untuk mengubah persekitaran pembelajaran kanak-kanak, ia boleh digunakan sebagai medium pembelajaran dalam pengenalan haiwan untuk kanak-kanak. Pada masa kini, kanak-kanak lebih suka menghabiskan masa bermain permainan berbanding belajar. Projek ini adalah untuk membangunkan zoo realiti tambahan untuk pendidikan kanak-kanak menggunakan platform perpaduan dan juga untuk mengesahkan kefungsiian aplikasi. Projek ini menggunakan augmented reality sebagai kaedah. Augmented Reality dapat menyediakan kemudahan yang menarik seperti memaparkan objek tiga dimensi haiwan ini berserta bunyi haiwan dan animasi menggunakan telefon pintar. Ini membolehkan kanak-kanak berinteraksi dan menjadi lebih kreatif dalam mengenali haiwan ini. Hakikat bahawa guru akan dapat menggunakan aplikasi ini sebagai sebahagian daripada kurikulum mereka adalah salah satu hasil yang dijangkakan daripada projek ini. Hasilnya membuktikan bahawa aplikasi ini dapat membantu kanak-kanak belajar tentang haiwan dengan cara yang menyeronokkan. Aplikasi ini dapat membantu guru memperkenalkan tentang haiwan untuk kanak-kanak. Aplikasi ini akan memperkenalkan nama, bentuk, penerangan haiwan malah bunyi haiwan.

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LIST OF SYMBOLS

- - Degree



LIST OF ABBREVIATIONS

AR	-	Augmented Reality
VR	-	Virtual Reality
AI	-	Artificial Intelligence



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CHAPTER 1

INTRODUCTION

1.1 Background

Coronavirus Illness (also known as COVID-19) is an infectious disease that is caused by the SARS-CoV-2 virus. The vast majority of people who have this virus will only experience mild to moderate respiratory symptoms, and they will be able to recover without the assistance of any medical professionals. On the other side, some will become seriously ill and will require aid from medical professionals. People who are elderly or who already have an underlying medical condition, such as cardiovascular disease, diabetes, chronic respiratory disease, or cancer, have an increased risk of contracting a serious illness. COVID-19 has the potential to make anyone sick, lead them to become severely unwell, or even cause death at any age. According to New Straits Times on 25th February 2022 Covid-19 infections in Malaysia are continuing to grow, with 32,070 cases reported, the highest number since the pandemic began in 2020. This is the second day in a row that the country has had over 30,000 daily infections. COVID-19 may develop in children, even very young ones. Many of them show no signs or symptoms. Those who do become ill have milder symptoms such as a low-grade fever, tiredness, and cough. Since the epidemic began, Malaysia has recorded 35656 Coronavirus fatalities, according to the World Health Organization (WHO). Children are included in this mortality statistic[1].

Due to covid19 parents anxious to bring their children out of the house. However, children need to explore the outside world for the sake of the development of their minds.

For example, visiting zoo to learn about wildlife. In current technology, Augmented Reality (AR) have been popular for gaming. Thus, it can help children to explore the zoo without go to the zoo. By using augmented reality will allow the children to see the animal in 3D via online virtual.

1.2 Problem Statement

Technology has evolved into an essential component of many parts of people's day-to-day lives, including the lives of children. Children may experience both positive and negative effects from the use of technology in educational settings including classrooms and other learning environments. There are a few advantages and disadvantages that come along with the use of technology by youngsters. To begin, the usage of technology can pique the interest of younger kids. A significant number of today's preteens and teenagers have been familiar with various electronic devices ever since they were infants. As a consequence of this, many children associate exciting and enjoyable activities with the use of computers, tablets, and other such devices. Because of this, the use of technology in the classroom not only helps to keep students interested and enthusiastic while they are in class, but it also revitalises the traditional learning experiences that they have previously had. The second issue is that conventional printed books are static, which means they only have a constrained selection of different animal pictures. Despite the fact that it is still an effective and straightforward strategy, they have a high propensity for being bored and losing focus while they are in the process of learning. Because today's youngsters are constantly exposed to new technologies and gadgets, a learning approach that incorporates technology into the devices themselves, such as an app for augmented reality that can be downloaded on a

smartphone, would be a more interesting and exciting choice. Young children can start acquiring knowledge and abilities that will serve them well throughout their academic and professional careers at any point in their childhoods; it is never too early to get a head start on these things. In this sense, beginning one's education with a focus on technology at an early age is an excellent way to begin setting the basis for future success[2].

1.3 Project Objective

The objective of this project are:

- a) To study augmented reality zoo for children education using unity platform.
- b) To develop augmented reality zoo for children education using unity platform.
- c) To validate the functionality of developed augmented reality zoo for children education using unity platform.

1.4 Scope of Project

The scope of this project are as follows:

- a) Study on the differences between augmented reality (AR), artificial intelligence (AI) and also virtual reality (VR).
- b) Designing a zoo simulation for children education by using unity platform.
- c) Four (4) 3D model of animals which is Tiger, Horse, Lion and Elephant created as this application focus on animal

- d) Additional feature sound effect and animal information in application were added.



CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discuss the important information and details which are found by several study and research from related previous study. Therefore, the discussion begins with the study of augmented reality and also its concepts. It is important to do some research about these concepts because they are the main objective of this project. Futhermore, as this project involve in technology that combines virtual information with the real world, it is vital to study the concepts of virtual reality and artificial intelligence to compare the differences.

2.2 Augmented Reality

The term "augmented reality" refers to a technology that combines our perceptions of the real-physical world's features with computer-generated images, video, audio, and other data such as GPS coordinates. Augmented Reality is a real-time and interactive technology. The hardware and software that are utilised in Augmented Reality applications allow for it to be enhanced by the addition of virtual data on top of the real environment that we are perceiving. Augmented reality, in contrast to virtual reality, does not involve a computer-generated virtual simulation that will transport the user away from reality. Instead, augmented reality enhances the real world in which the user already exists[3].It is possible to list several advantages of augmented reality applications as a few instances include translating information to a real-world setting surroundings, concretizing knowledge that

was previously abstract, and boosting talents related to movement, an interest in enrolling pupils. The use of MR technology has been implemented in a broad variety of fields, including tourism, industries such as marketing, surgery, logistics, production, and entertainment maintenance, as well as other duties [4], [5].

2.2.1 Concept of AR

When a camera detects markers or an image in its environment, it combines the two to create an augmented reality experience. After that, an approximation of the position and orientation is made to complement the actual data. The subsequent stage is to recognise the markers, which are representations of symbols that are compared to models that have been saved in memory. The 3D virtual objects will be adjusted until they match the markers, which are positioned and oriented according to the recognised marker. The result of this procedure is the creation of virtual objects in video frames or on a screen, which can then be examined in all three dimensions by the user. The steps involved in the operation of augmented reality are shown in the following diagram.

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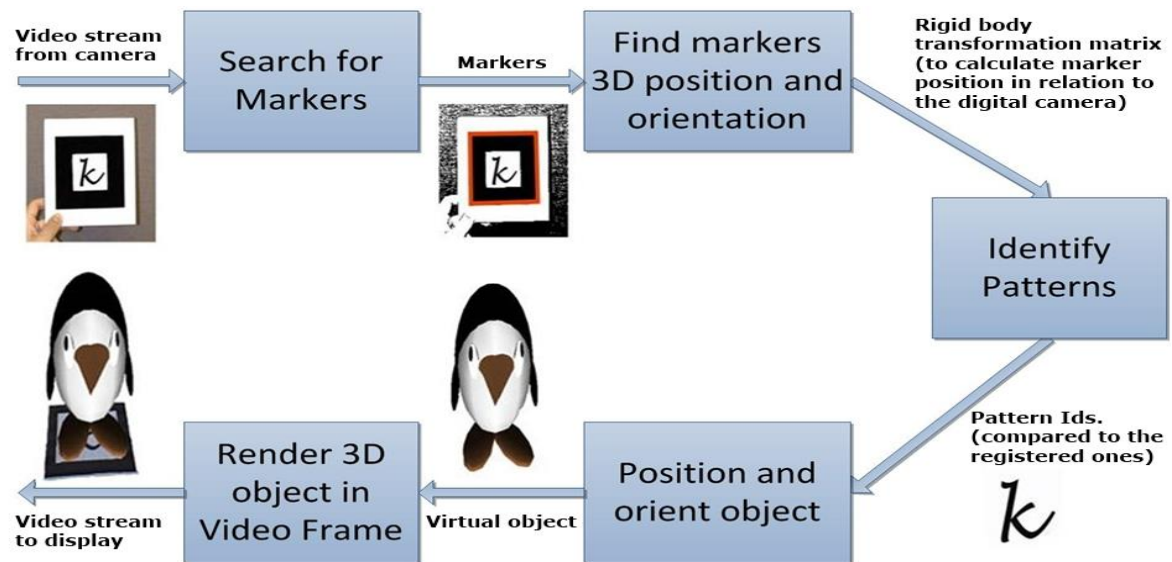


Figure 2.1 Flow of AR works.

2.2.2 AR Hardware and Software

The degree to which AR systems realistically integrate augmentations with the real environment is a significant metric. The goal of augmented reality is to improve knowledge and provide positive outcomes for a genuine object or location. As a result, the hardware and software used in AR projects are important. A CPU, display, sensors, and input devices are the most important hardware components for AR. All of these elements are present in contemporary mobile computing devices, including smartphones and tablet PCs. These devices have components such as a camera, sensors such as an accelerometer, and GPS, which make them appropriate for AR platforms.

The following hardware and tools were utilised for the project:

- A camera to record the markings and identify them.
- A display for the image that was captured.
- The flashcard with the marker image.

Apart from being independent of the camera, the programme must determine real-world coordinates. To supplement and mix 3D modelling, a software application