



Designing Augmented Reality Surah Al-Fatihah Application in Assisting Learning for Children

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ABSTRACT

The development of the world of technology which is getting more advanced every day has helped people to facilitate human activities such as military activities, government, offices, entertainment and others. One of them is education, with the application of sophisticated technology, of course, it can help activities in the teaching and learning system, one of which is the use of smartphones. Smartphones have now become a lifestyle and necessity among various people even among children who mostly depend on smartphones to fill their time every day, but this not only produces a positive side for the child but also gives negative impact on their life patterns. At this time many children use the smartphone only for games and entertainment, wasting a lot of time in vain and leaving the Quran activities. This condition requires us to make smartphone use even more positive. So a learning application of the Al-Fatihah surah was designed using Android-based Augmented Reality which was designed and programmed using Unity 3D and Vuforia. In order to make children more interested in learning Surah Al-Fatihah.

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1. Introduction

With the rapid development of science and information technology in the era of globalization and the modern sophistication of technology, this has made technology a necessity in facilitating daily human activities, such as military, government, office, entertainment and other activities. One of them is education, with the application of sophisticated technology, of course it can help activities in the teaching and learning system^[1]. The technology in question is Augmented Reality (AR) which is a new idea or idea from technology related to graphic design and multimedia-related. Broadly speaking, Augmented Reality is an amalgamation of real and virtual objects in the real environment in real time and is well integrated and clear. In this case, of course, Augmented Reality can provide advantages in the interaction between humans and computers through the appearance of objects that are attractive and resemble real objects (original) and are in 3-dimensional form (3D) so that they look clearer and real time^[2].

The emergence of various applications provides options in improving the performance of a job, both desktop-based and web-based, until now there are Augmented Reality applications running on mobile for application development besides being easier in operation, also using the touch screen system approach (touch on screen) which makes it easier for customers to handle navigation. ^[3]. Mobile devices with the Android operating system provide many conveniences for its users. Devices with this operating system have almost all the capabilities of a computer device, ranging from word processing, reading email to playing 3D games ^[4], because Android provides an open source operating system ^[5] so that it can be developed by many developers freely. Augmented reality has advantages that can provide experiences and understandings that are easy to understand for the learner's subject. With these advantages, it allows augmented reality to be used as an interesting and interactive learning method. One of the effective ways is by using technology that provides accurate visual feedback by using Augmented Reality technology ^[6]. There are several studies that use previous augmented reality technology such as research conducted by Muhammad Rizky Mubaraq with the title "Implementation of Augmented Reality in Learning Media for Android-Based Fruits" where the application presents 3D objects from fruits that are displayed in Augmented Reality and also provides description of the fruit object ^[1]. Research conducted by Sri Rahayu Lestari with the title "Design and Build Augmented Reality in Restaurant Menu Data" which produces an application where restaurant menu data is



made into 3D images that are displayed using augmented Reality technology ^[2]. Mila Jurnalis made research with the title Smart Hijaiyyah Learning Application Based on Augmented Reality, where in this study the Android-based Augmented Learning media application only used the Hijaiyyah letter object ^[8]. The research conducted by Fujiati et al entitled "Design of Game Development of Snakes Against Caterpillars Using Augmented Reality" produces a game application with 3D Caterpillars and Snakes that fight each other using Augmented Reality ^[5]. Muhammad Fahmi Rayda conducted a research entitled "Implementation of Augmented Reality on Android-Based Computer Hardware" which in this research produced an android application that displays 3D objects of computer hardware such as RAM, Motherboard and others using Augmented Reality technology ^[7].

2. Metodology Reasearch

This study generally aims to build an Augmented application Reality on Android-Based Augmented Reality Learning Media in Surat Al-Fatihah Using the Marker Based Tracking Method. In this study, the following steps were carried out, namely: the analysis stage, the design stage, the development stage, and the stage testing. The following are the steps used in this research are:

- a. Analysis Phase Contains the things that must be in the design results in order to be able to complete existing problems according to purpose. As for what is needed in conducting this research is collecting data in the form of supporting theory from the system made with the intention to explain about the theories associated in this research. The sources are obtained in the form of literature, e-books, and related journals used in publication research scientific papers in local and international journals.
- b. Design Stage This stage is used to process data from the results of data collection and then designing with the use of Augmented Reality technology so that it becomes a effective and efficient application.
- c. Development Stage At this stage the implementation is in the implementation of applications that have been made in the analysis and system design into a computer program using the C programming language Sharp (C #), the software used to create Augmented Reality is Unity 2018.3.9f1, Vuforia, Blender to create 3D objects.
- d. Testing Phase
 - 1) System Testing At this stage the researcher tests the system that has been created using theoretical and practical testing. Testing the theory of researchers using blackbox testing
 - 2) System Verification and Validation System verification and validation aims to test the feasibility and rationality of the system by practitioners associated with research. This step is performed using a system test format.
 - 3) Documentation This method contains a report and a final conclusion from the results of the analysis and testing in the form of a thesis.

3. Result and Discussion

The following describes the results and discussion of the design of the implementation of Augmented Reality on Android-Based Augmented Reality Learning Media in Al-Fatihah using the Marker Based Tracking Method. Broadly speaking, the system process to be designed is illustrated by the use case diagram in Fig 1 below:

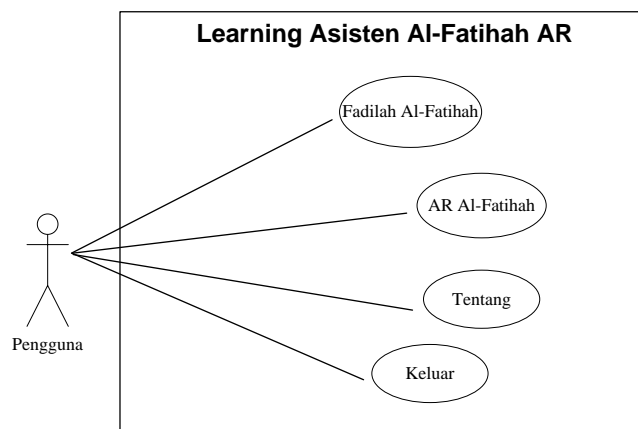


Fig 1. Use case Learning Asisten Al-Fatihah Augmented Reality

3.1 Interface Result

a. Interface Icon Launcher

The following is the appearance of the launcher icon when the AR Al-Fatihah application is successfully installed and running on a smartphone device and the launcher icon will look like Fig 2. The following:

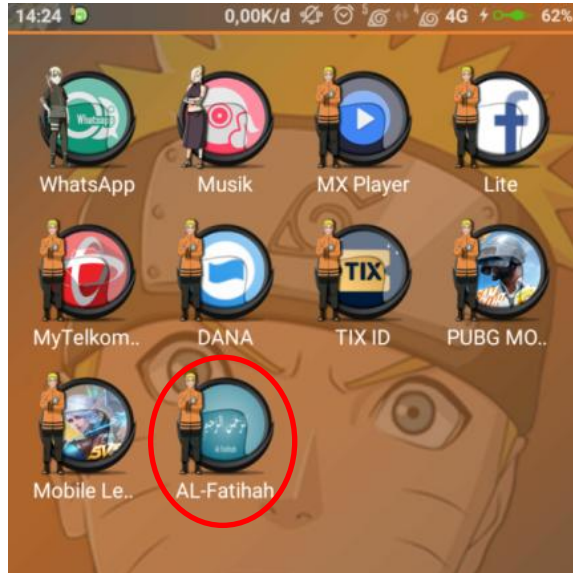


Fig 2. Icon Launcher Aplikasi

b. Interface Splash Screen

After the user presses the application launcher icon, the application will display a splash screen as shown in Fig 3. The following:



Fig 3. Splash Screen Al-Fatihah Augmented Reality

c. Interface Home Page

Shortly after the application displays the Splash screen, the application will display the main menu with a display like Fig 4. below:

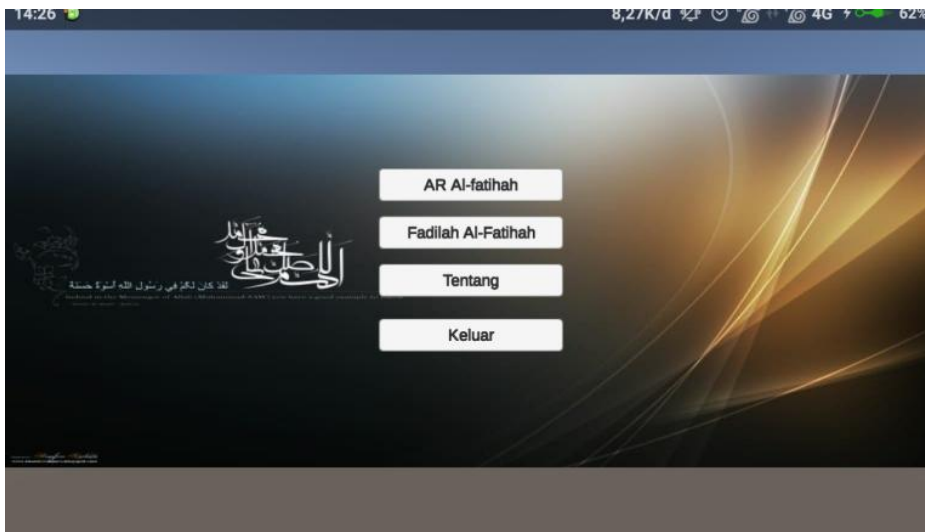


Fig 4. Interface Home Page Al-Fatihah Augmented Reality

d. Interface AR Al-Fatihah

The following is the display if the user selects the AR Al-Fatihah sub menu and the display will look like Fig 5. below:

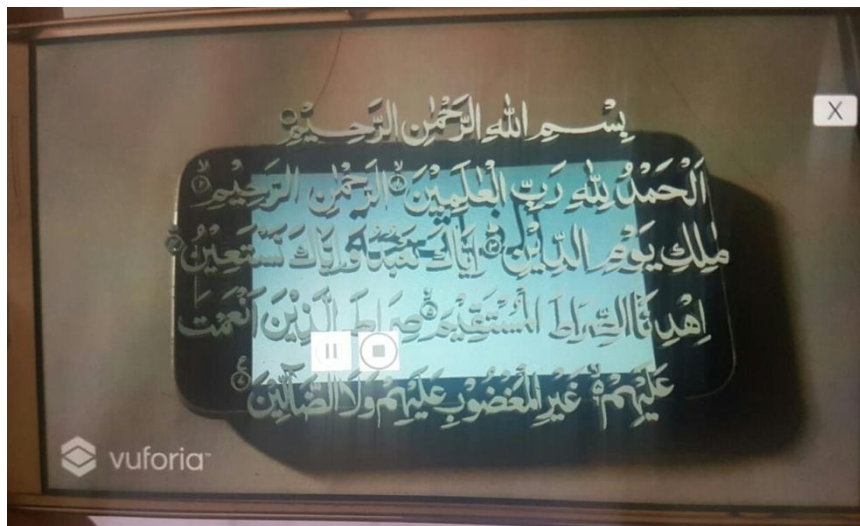


Fig 5. Interface Al-Fatihah Augmented Reality

After the camera has successfully scanned the marker, the 3D text object will appear and the user can also play, pause and stop the audio by pressing the play, pause and stop button.

e. Interface Fadhilah Al-Fatihah

The following is the display if the user selects the Fadhilah Al-Fatihah sub menu and the display will look like Fig 6. below:

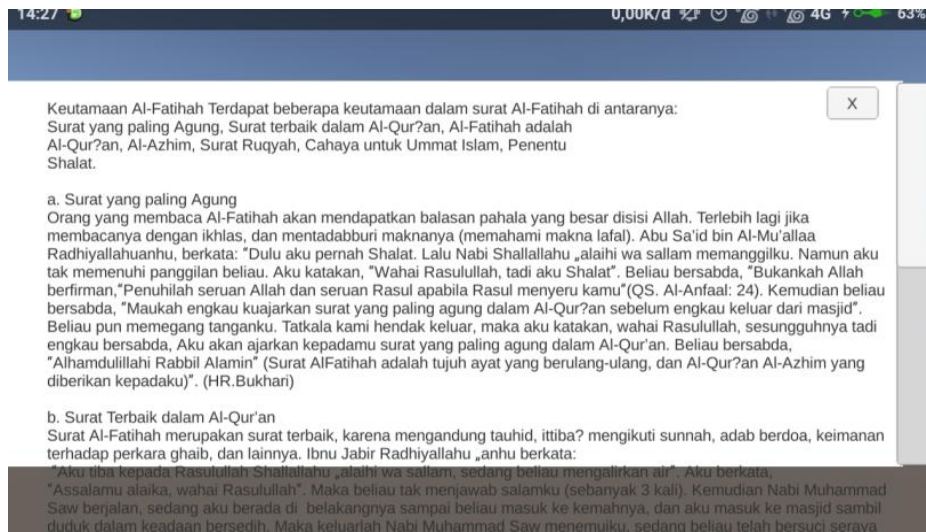


Fig 6. Interface Fadilah Al-Fatihah Page

f. Interface About Page

The following is a display of the sub menu about what will look like Fig 7. below:

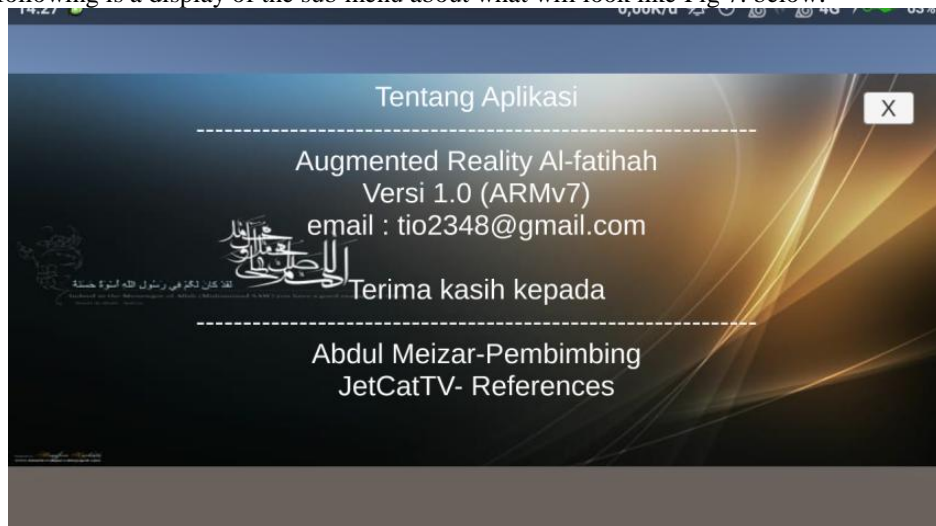


Fig 7. Interface About Page

g. Marker

Markers have certain detection points that are useful for making it easier for the camera to detect markers with a certain distance, so that the camera can still display objects. This detection point also serves to help users if they are in a slightly dark room. Due to the increasing number of detection points on the marker, it is able to assist the camera in capturing the point and bringing out objects. The shape of the marker for the Surah Al-Fatihah object can be seen in Fig 8.



Fig 8. Shape Marker for the Object of Surat Al-Fatihah

In the marker image, it can be seen that the markers have certain detection points or patterns that are useful for making it easier for the camera to detect markers with an optimal distance of up to ± 50 cm and a degree of tilt up to 30° so that the camera can still display objects. The more detection points there are on the marker, the faster the camera will recognize the marker and bring up objects.

4. Conclusion

From the description of the explanation and discussion of all the material in the previous chapters and in order to complete the thesis report, it can be concluded that the main conclusions of the AR Al-Fatihah application based on the mobile android are as follows:

- a. The AR Al-Fatihah application makes it easy for users to learn Surat Al-Fatihah.
- b. The AR Al-Fatihah application can use data stored in the Vuforia database.
- c. The application does not require an internet connection because the database has been built into the application.
- d. The marker to be used must be uploaded first to Vuforia so that it can be scanned when scanning the marker.
- e. The AR Al-Fatihah application is designed using 3D objects.

5. References

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