DESIGN AND BUILD AUGMENTED REALITY ON FILM POSTER USING OCCLUSION BASED DETECTION METHOD

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Abstract

Movie posters are forms of visual communication that are designed to give the impression and interest to film viewers. As one of the promotional media, the information contained in the movie poster is limited to short images and writing, so that the information conveyed is not detailed. Based on research conducted on the effectiveness of film information on film posters, it shows that the information contained in film posters is less effective, only limited to images and writing. Augmented Reality technology solves the problem by adding virtual objects in the form of video trailers, and other movie information and implementing the Occlusion Based Detection Method to detect poster markers. The result of the research that is Augmented Reality technology can be applied to design ARCinema application that can help people knowing effective information in choosing a film.

Keywords : Movie Poster, Augmented Reality, Occlusion Based Detection Method.

1. INTRODUCTION

The growing pattern of human thinking has an impact on increasingly advanced technological developments, where in this era of globalization the information obtained is required to be fast and easy. The rapid development of technology has an impact on all aspects of life. One of them is in the world of film.

Film is an audio-visual communication medium to convey a message to a group of people gathered in a certain place. (Effendy, 1986: 134). Movie messages on mass communication can take any form depending on the film's mission. However, generally a film can include a variety of messages, be it educational, entertainment and information messages. The message in the film is to use the symbolic mechanism that exists in the human mind in the form of message content, sound, speech, conversation and so on. Nowadays there are various kinds of films, although the approach is different, all films can be said to have one goal, namely to attract people's attention to the content of the problems they contain. In addition, films can be designed to serve the purposes of both the limited public and the broadest public.

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2. RESEARCH METHOD

2.1. Systems Development Method

This system development method uses the RUP (Rational United Process) method, the Rational Unified Process (RUP) is a software engineering method developed by collecting various best practices found in the software development industry. The main feature of this method is that it uses a use-case driven and iterative approach to the software development cycle (Salahudin M, Rosa A.S., 2011). RUP (Rational Unified Process) is divided into 4 (four) stages, namely:

1. Inception

In this phase, the necessary data and information is collected regarding the application to be built. The information obtained by the author by making observations, interviews and literature study.

2. Elaboration

In this phase, analysis, design and test planning are carried out. Most of the work done by the author at this stage is to design a system using UML (Unified Modeling Language).

3. Construction

In this phase the system that has been designed begins to be implemented and tested. Most of the work the author does is coding.

4. Transition

This phase is the last phase where the program has been completed and is ready to be handed over to the user. The work done by the author in this phase includes completing the program documentation and program demos to the user.

2.2. Problem Solving Methods

The problem-solving method used in this study is to use the Occlusion Based Method

2.2.1. Occlusion Based Method

The Occlusion Based method is a method for detecting the presence or absence of occlusion in the appearance of visual objects, simply occlusion based only defines a state where a marker is not detected because it is closed by another object. Meanwhile, the occlusion based use is only based on the 2D coordinate positions of the two existing objects. The formula used to determine the occurrence of a collision uses the following equation:

$F(x) = SUM(pixel\ gray\ level)+SUM(pixel\ gray\ level)+SUM(pixel\ gray\ level)$

$F(x) = (F_{11}+ F_{12}+F_{13}+F_n)+ (F_{21}+ F_{22}+F_{23}+F_n)+ (F_{31}+ F_{32}+F_{33}+F_n)$

If the final $F(x)$ = initial $F(x)$, the system will detect that there has been a relationship between the User and the Marker Object in Real Time.

Occlusion based interaction is an exocentric interaction design wherein defining events to produce their action uses the occlusion detection method above. Interaction design using 2D projection of virtual objects reduces the complexity required in designing interactions in other AR systems that use virtual plane references. as shown in figure 1.
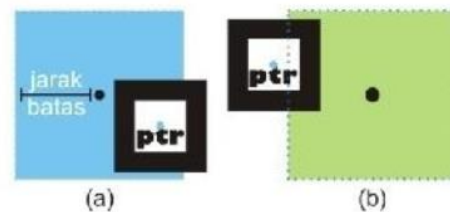

Figure 1. (a) Event Occurring (b) No Event Occurring

If the blue point in the middle of the marker ptr is an object O1 and the black point is an object O2, then Figure 3 (a) is said to have an event because it fulfills the inequality 1 and 2, namely the coordinates O1 (x, y) are within the boundary of the O2 area. Meanwhile in Figure 3 (b) there is no event

because it only fulfills inequality 2 (the value of O1y is within the O2y limit) but does not fulfill inequality 1.

In building a system using Occlusion Based, several things to be analyzed are the stability of the virtual object overlay (seen from the number, size, and marker distance), the accuracy of occlusion detection (seen from the size and position of the marker), and user comfort (level of ease of use and learning.) in using the system.

The flowchart of the Occlusion Based Method is as follows:
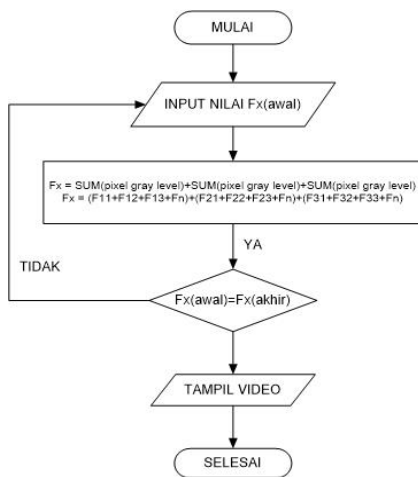
Figure 2. *Flowchart* Metode *Occlusion Based*

3. RESULTS AND DISCUSSION

3.1. System Analysis

In building a knowledge application regarding Android-based film information, several stages of analysis are carried out, namely:

1. Collecting data about information contained in a film such as a video trailer, synopsis, and other film information.
2. System analysis and make a system design to be built.

3.2. System planning

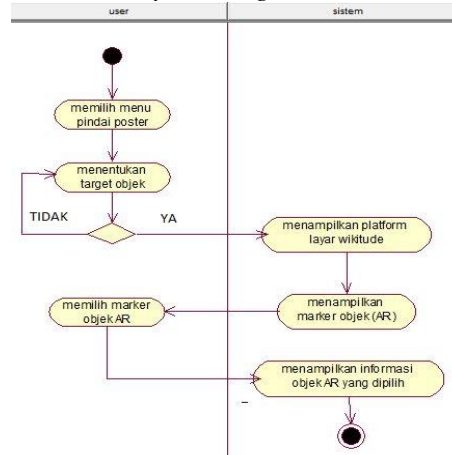The design method or software modeling used in this research is the Unified Modeling Process (UML) design method.

1. *Use Case Diagram*
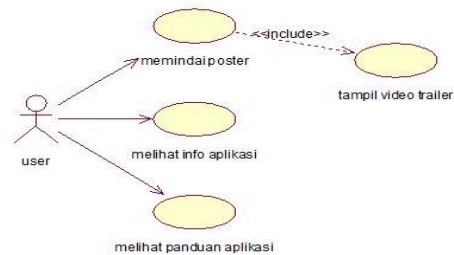
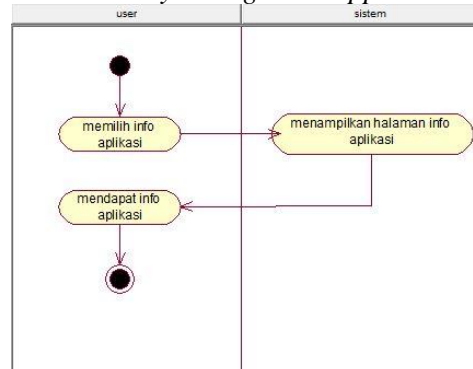**Figure 3.** *Use Case Diagram*

2. *Activity Diagram*
a. *Activity Diagram Scan Poster*

Figure 4. *Activity Diagram Scan Poster*

b. *Activity Diagram Application Info*

Figure 5. *Activity Diagram Application Info*
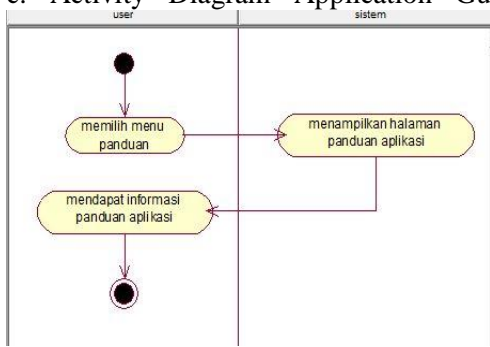
c. Activity Diagram Application Guide

Figure 6 Activity Diagram Application Guide

3. *Class Diagram*
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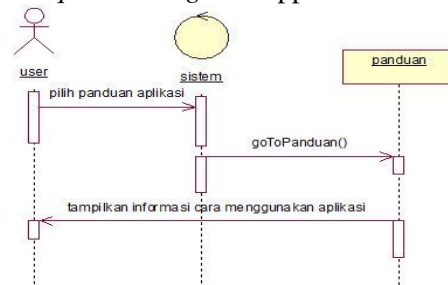**Figure 7.** *Class Diagram*

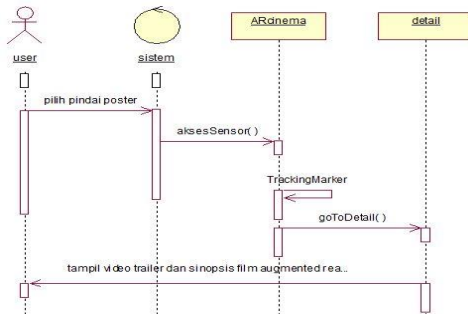### 4. *Sequence Diagram*
a. *Sequence Diagram Scan Poster*

Figure 8. *Sequence Diagram Scan Poster.*
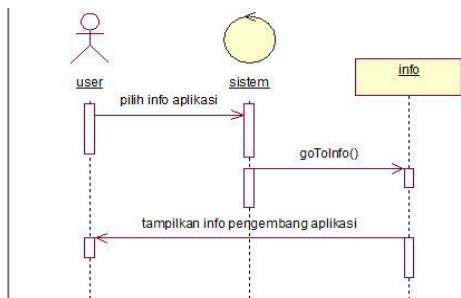
b. *Sequence Diagram Application Info*

Figure 9 *Sequence Diagram Application Info*

c. *Sequence Diagram* Application Guide

Figure 10. *Sequence Diagram* Application Guide

3.2 System Implementation
1. Interface Splash Screen

Figure 11. Interface Splash Screen

2. Interface Play Main Course

Gambar 12. Interface Play Main Course
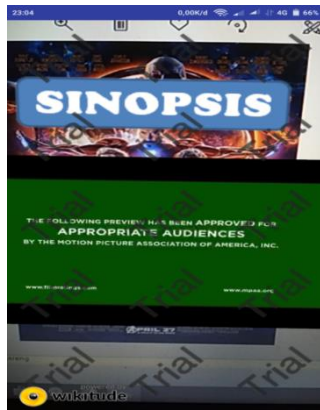
3. Scan Poster Game Interface

Figure 13. Scan Poster Game Interface

4. Application Info Menu Interface

Figure 14. Application Info Menu Interface

5. Application Guide Menu Interface

Figure 15. Application Guide Menu Interface

4.CONCLUSION

Based on a series of processes from design to implementation in the Augmented Reality application and the Occlusion Based Detection Method for film information, it can be concluded that:

1. Applications that are made can be used to find film information about trailers and synopsis in the form of Augmented Reality.
2. Can help the public to find information on a film to be selected.

5.ADVICE

The following are suggestions that are deemed necessary to be considered for further research:

1. The results of the scan maker will bemore interesting if the output results are added with a 3D object.
2. Submission of film information in theform of augmented reality can be used for film promotion.

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