SOLIFE AUGMENTED REALITY ANDROID APPLICATION

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Abstract

Solife is an innovative Augmented Reality (AR) application with a primary objective of enhancing daily life communication and bridging gaps between people. It addresses the struggles young individuals face when communicating with strangers effectively. Developed using Unity, Solife combines various technologies to achieve its goals, including device information retrieval through mobile devices. By harnessing the power of AR, Solife recognizes and processes information, presenting relevant results to users interactively and immersivity. The project's remarkable aspect lies in its dynamic information display, which adapts and updates as user data changes, ensuring access to the most relevant and up-to-date information in real-time. This enhances the user experience and seamlessly integrates AR technology into daily interactions. Solife takes the form of an Android mobile application, providing a user-friendly interface and intuitive controls to navigate through its augmented reality features. It serves as a platform for individuals to connect, communicate, and engage with others in a technologically advanced manner, fostering social connections and reducing barriers to interpersonal communication. By skillfully combining AR technology, information retrieval, dynamic display, and user-friendly software, Solife successfully addresses the challenges young people face in communicating with strangers. It

envisions a more connected society, where individuals easily interact and build relationships with people from diverse backgrounds, ultimately enriching their daily lives. Solife represents a significant step towards making augmented reality a tool for enhancing human connections.

Keyword**:** Augmented Reality, Unity, Social Problems, Application.

Introduction

This article is a technical report of Solife augmented reality Android application software. It mainly introduces the use, design, development, software architecture and other processes of Solife, as well as the thinking and summary of this development.

Methodology

1. Software design methodology

For this project，Agile methodology is often used in software development projects, including those involving augmented reality (AR) technology, because it emphasizes flexibility, collaboration, and rapid iteration. These principles can be particularly useful in AR projects that are designed to enhance daily life communication.

In an AR project, developers and designers may need to continually adjust and refine the technology to meet the needs of users and to keep up with changing technologies. Agile methodology allows for more frequent testing and feedback cycles, enabling developers to quickly identify and address any issues or opportunities for improvement. This approach can help ensure that the final product meets the needs of users and is effective in enhancing daily communication.

Additionally, agile methodology encourages close collaboration between developers, designers, and stakeholders, which can be especially important in AR projects where

the technology is often complex and requires input from multiple sources. By working closely together, the team can ensure that the technology meets the needs of all stakeholders and can be effectively integrated into daily life communication.

Overall, agile methodology can be a valuable approach for AR projects focused on enhancing daily life communication, as it promotes flexibility, collaboration, and rapid iteration, enabling developers to create a technology that truly meets the needs of users.

2. Model design

2.1 Activity Diagrams

An activity diagram is an important UML diagram to describe the dynamic aspects of a system. Activity diagrams can also summarize user details in a system. Figure 2.1 shows the activity diagram of the Solife AR application. After entering from the main menu, there are four functions, community, AR scanning, news and personal information. Each function has the following derivatives.

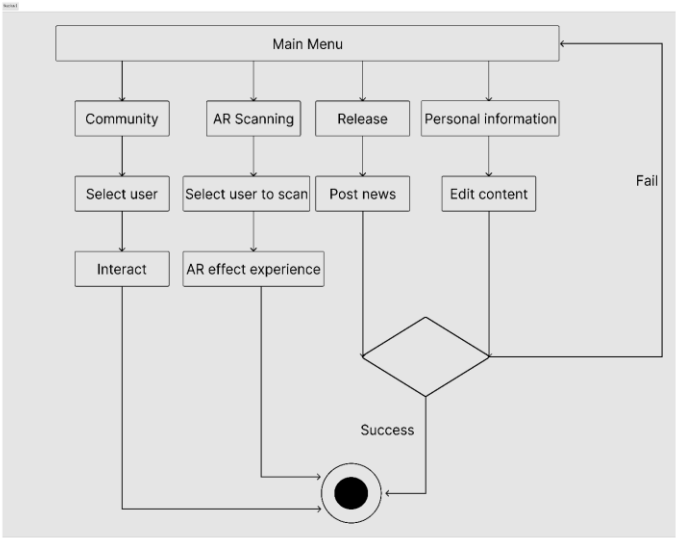

Figure 2.1. Activity Diagrams

2.2 Context diagram

Context diagrams focus on the detailed flow of data within the system with entities outside the system. For the Solife AR application, the flow of data can be seen through the relationship between the application and the user. Figure 2.2 shows the context diagram of the Solife AR application. When the user clicks the AR scanning function on the Solife software, the camera is aimed at the object to be scanned, and the user's latest personal information will be displayed on the phone.

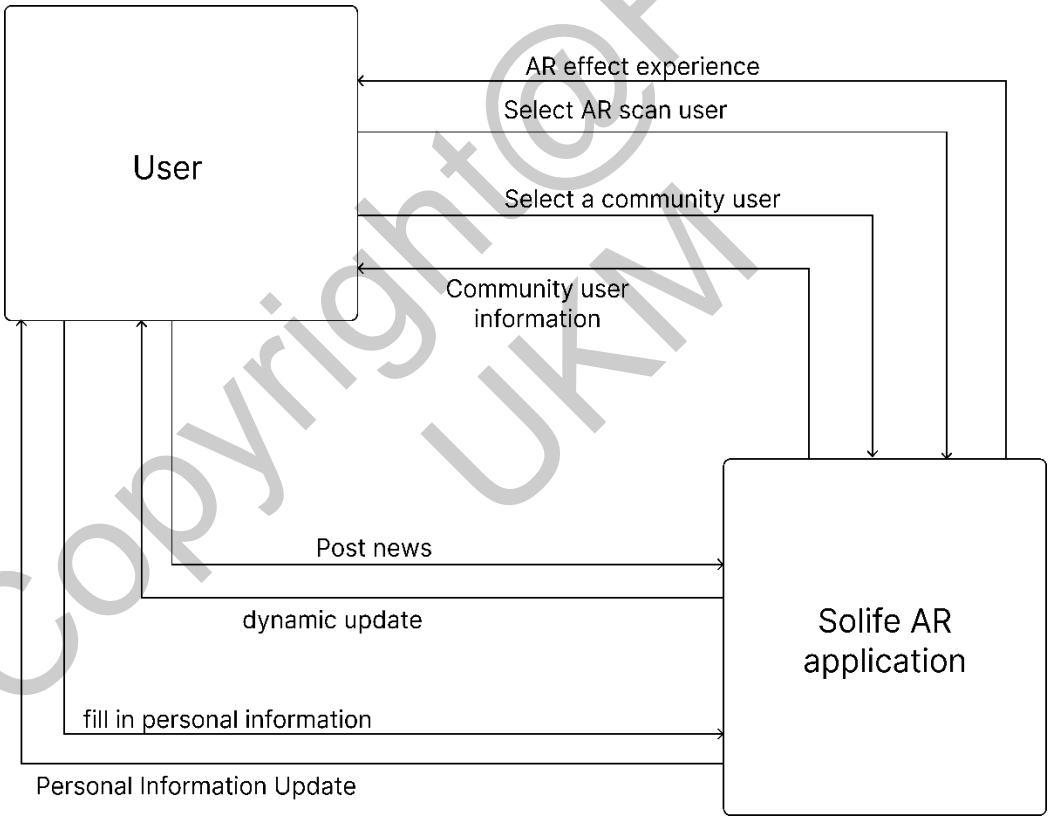

Figure 2.2. Context diagram

2.3 Client-Server Mode

Figure 2.3 shows the client-server model, where a User as a client makes a request to the server, and the server responds by accepting or refusing to connect to the client's request. Before a user logs into an application, the client device sends a request to the server to confirm acceptance of the user's login. After the user successfully logs in, the user can start to modify personal data and apply for viewing other user data requests. On the AR server, when the user uses AR, the server will apply for the permission to use the camera of the device, which can be implemented on the application.

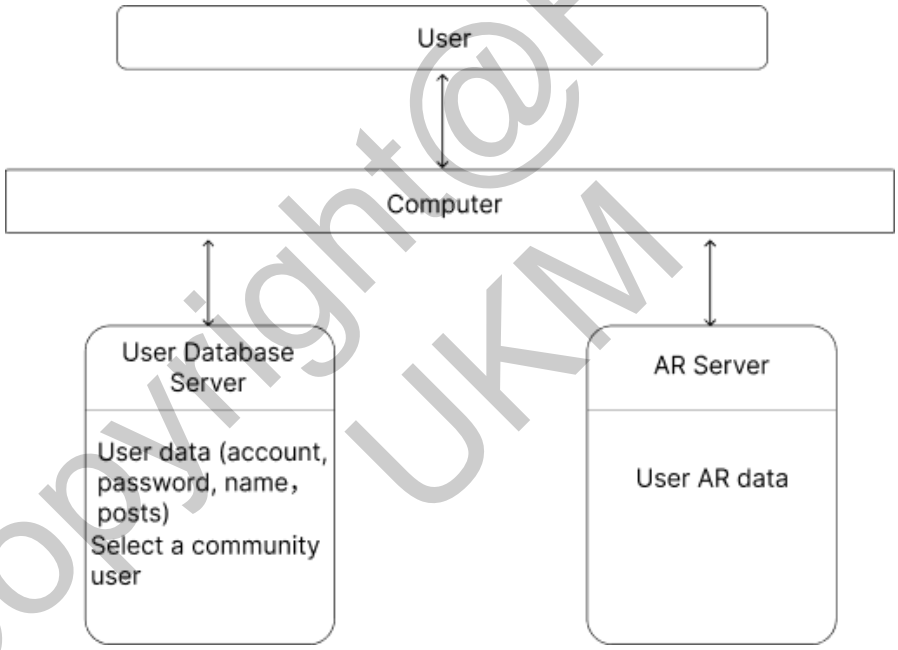

Figure 2.3. Client-Server Model

2.4 Hierarchy Model

In the hierarchical model, each parent node can have multiple child nodes, but each child node can only have one parent node. Figure 2.4 shows the hierarchical model of the Solife AR application. This application contains three main modules, namely the community module, including the posting of user dynamics. The second module is the

AR scanning module, including the display and results after AR scanning. The third module is the personal information module, including editing and updating of personal information.

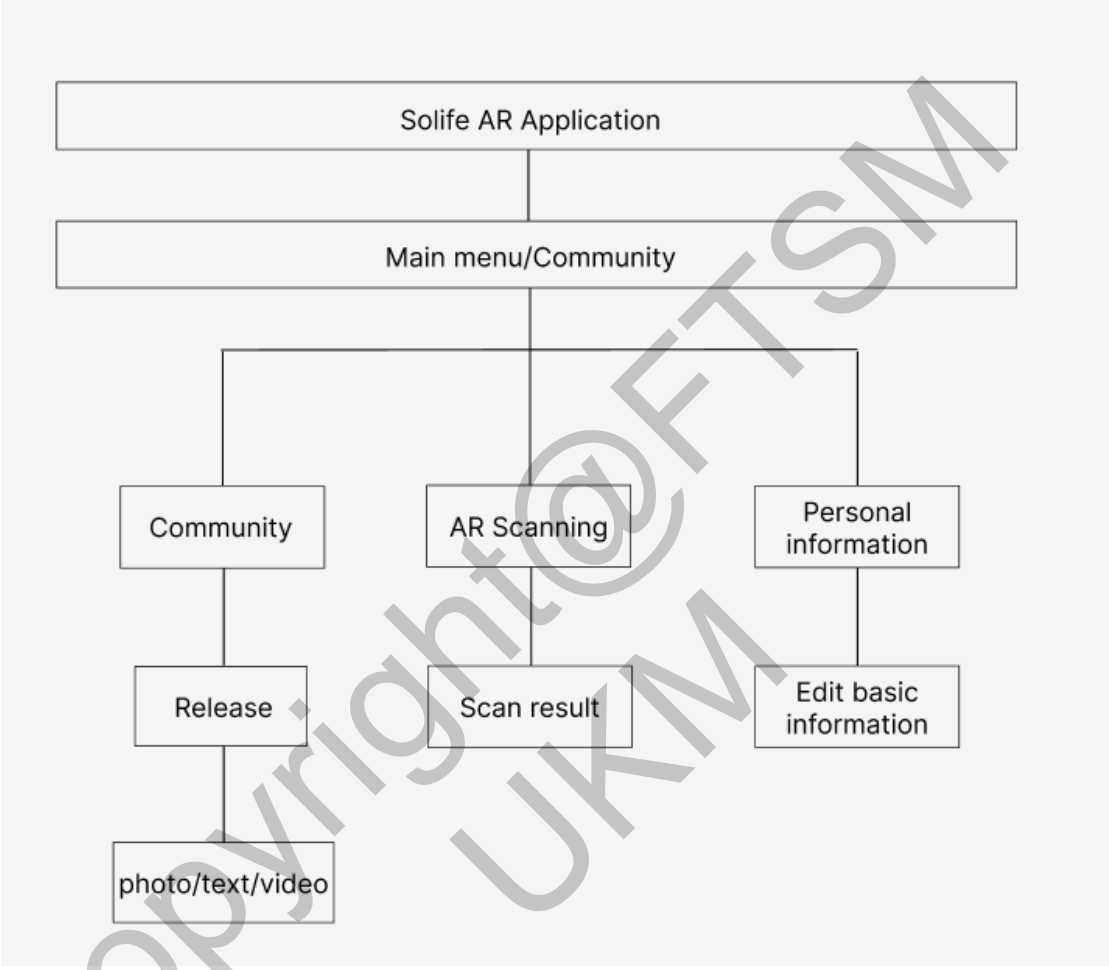

Figure 2.4.Hierarchy Model

2.5 Flowchart

A flowchart is a diagram representing an algorithm, workflow, or process, displayed in boxes of various types, connected sequentially by arrows. This flowchart will show the process that will take place in the application so that the user can better understand the application. The data flow chart of this project mainly includes four main

processes of login and registration account, community, AR scanning, and personal information. Figure 2.5 shows the flowchart of the entire application. After successfully entering, select different functions in the main menu to enter the corresponding page, and there will be different displays for success or failure.

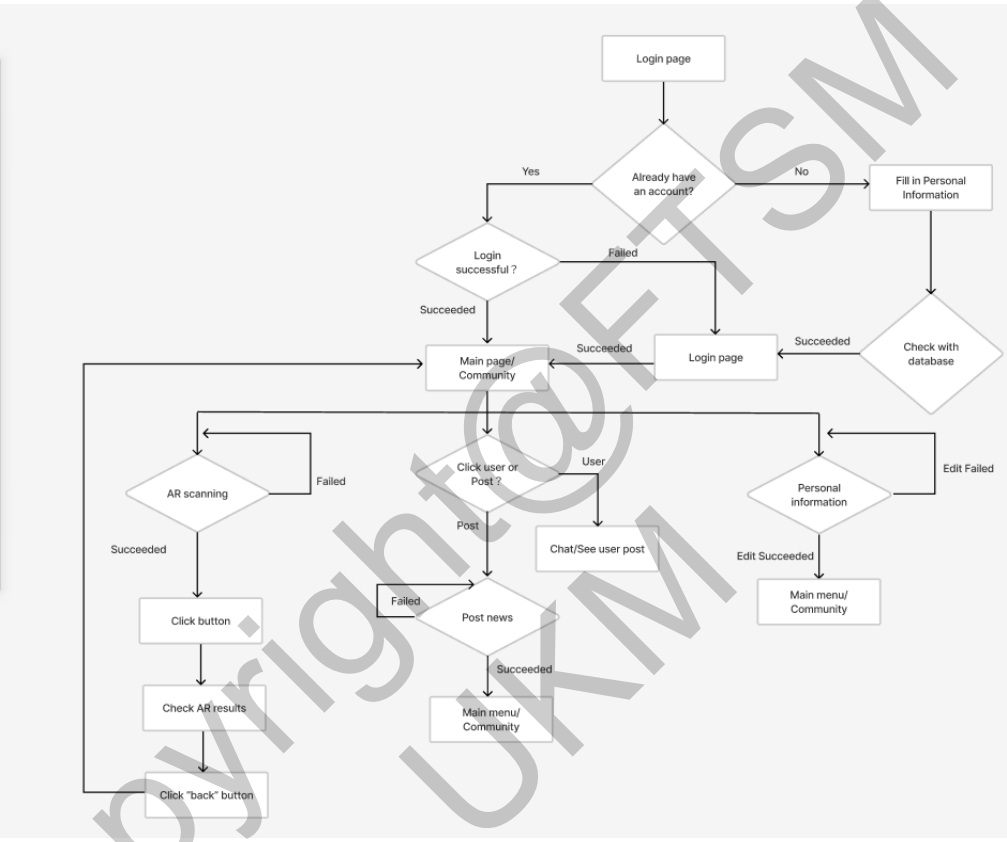

Figure 2.5 System Flowchart

Results and discussion

1. Results

1.1 Database

Unity needs to convert the data from the asset's source file into a format that it can use in a game or real-time application. It stores these converted files, and the data associated with them, in the Asset Database.

1.2 User interface

UI style: The page is simple, the function is clear.

Figure 1.2.1 is the main page, which is the page after successful login. Below is the navigation bar, there are three functions to choose from. And publish dynamic pages. The icon on the lower left can select the device album.

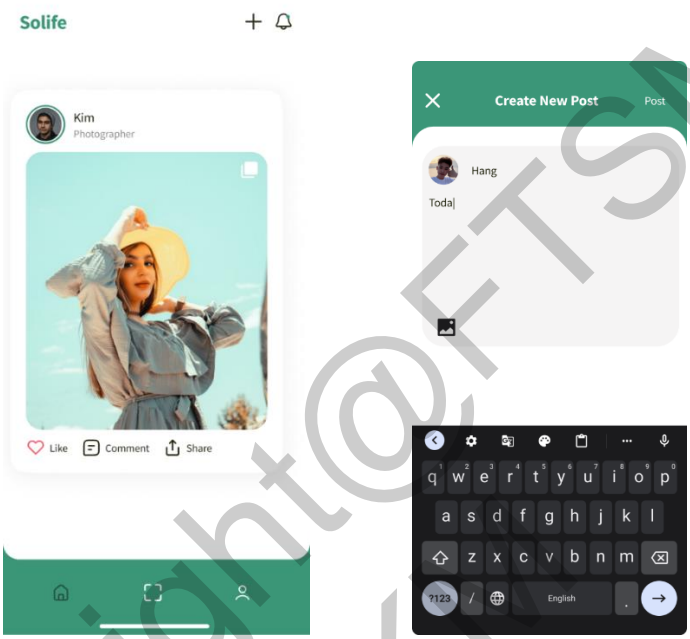

Figure 1.2.1 community page and post page

Figure 1.2.2 is the AR page after successful scanning and the personal information page. Click on information to show/hide. Avatar, personal information editing and today's mood update are available.

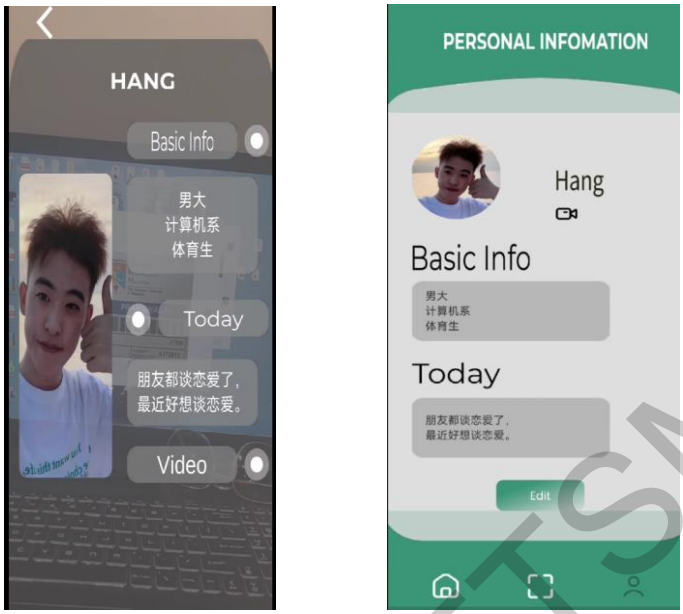

Figure 1.2.2 AR page and Information page

In the design stage, there is a registration page, which is bound by the Google account number, but in the actual development process, I found that I could not get the application to the Google port, so I deleted this section.As well as the community system that was set up at the beginning, because the required technology and database are too complicated, I can't complete it independently by myself, so I can only give up. So I focus more on UI production and the improvement of AR system.

2. Discuss

Personally, the current development of the project is still a long way from the expected results. I will briefly elaborate on the following points:

1. User interface

I am satisfied with the overall design of the user interface, the logic of jumping between pages is reasonable and practical, and the layout of buttons is also easy to operate. However, it cannot adapt to the screen size of different mobile phones.

2. Community

The community system built at the beginning, because the required technology and database are too complicated, I can't complete it by myself. Maybe I can ask for help later, and complete it together after deep learning.

3. Register

At the beginning, I built a login system through Google account, but in actual operation, I found that if a software is really implemented, Google account login needs to apply for a port from Google, and port purchase is required (requires a local credit card), and subsequent improvement may Collaborate with local students.

Conclusion

1. This technical report introduces the development of SOLIFE Augmented Reality Android Application. We have practiced the following goals and achievements in the current development stage:

1.1 Software architecture

The overall operation of the software has been tested, and each function can be used normally on Android phones.

1.2 Series interfaces

The jump between each interface conforms to the expected design and meets certain practicability.

1.3 Functionality

Although the functions at this stage have not yet reached the initial design standards, the general AR functions have been realized.

2. Goal

At this stage, I have completed the relevant code embedding of Google mailbox registration, but the port authorization is still not obtained.

3. Influence

The research direction of this project is to solve the problem of making friends with strangers through AR. The project is very practical, especially in Malaysia, a multi-ethnic and multilingual country.

4. Shortcomings and suggestions

Project development did not meet expected standards. Judging from the results, it reflects my immaturity in the project function anticipation stage, the choice of development mode is not wise, and the difficulty evaluation is wrong. However, this

development process also allowed me to gain a lot of experience. I hope that these problems can be effectively avoided in the future development process. The actual development process is not consistent with the design stage. Excessive pursuit of functions will greatly increase the difficulty of implementation.

Appreciation

I would like to thank my Supervisor Assoc. Prof. Dr. Tengku Siti Meriam Tengku Wook for his guidance and advice in the process of project development and the college for educating me on my professional skills.

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