

INTRODUCTION TO SOFTWARE ENGINEERING

PA0 - GROUP 7 - 22CLC02

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Project Name: Virtual Chat 3D

1. Introduction:

a. Problem statement

Online communication has been in high demand in this interconnected world. Internet users have been craving for ways to communicate, interact, work, and have fun together online. While the number of social platforms has been on the rise, **many users are still experiencing a lack of immersive connection with the others**. Due to this lack of effective way to communicate, **youngsters nowadays have been more separated from social activities**. Especially since the Covid-19 quarantine, **many felt isolated and disconnected from their friends and family**. On the other hand, although virtual reality platforms do increase the engagement between users, the high cost makes them fairly inaccessible to the majority.

Companies are also seeking better ways to build connections between team members, especially their remote workers. Many find it difficult to get to know their teammates and online meetings have become less attractive than ever. A safe and secure workspace is also crucial for managers to consider when choosing communication strategies.

b. Propose solution

Based on the idea that users will use their own models to visualize them and interact with other users, with a lower cost than expensive equipment like VR headsets but still be able to provide a dynamic environment, we came up with an idea to create "Virtual Chat 3D".

To create an engaging social environment, this project provides 3D worlds for users to interact and communicate with each other in real-time. Users can choose a character that best fits themselves to express their personalities. Users can interact with each other through virtual meetings and mini-games. **By incorporating 3D environments, users could feel more physically present in the virtual space, allowing for social connection to naturally occur and strengthen the relationship between friends and teammates.**

As chat rooms can be hosted locally in LAN, companies can utilize this application for meetings and team building. Remote workers could join in through third party VPN services. This empowers the security and privacy for users and companies.

There is also an integrated 3D AI chatbot to accompany our users, helping those who are in need of guidance or those who just want something to talk to and play around.

"Virtual Chat 3D" creates an engaging, cost-effective solution that addresses the limitations of traditional communication methods while fostering a sense of community and connection among users.

2. Target users and environments

Target users: Target users are those who seek to interact with their friends on a daily basis. Companies can also utilize this application to create innovative workspaces for co-workers. On the other hand, this project provides an immersive experience, conversation, roleplay with 3D virtual anime characters. Target users also are those who want to talk, interact with a virtual character.

Environment: Android smartphone.

3. Key features

a. Account management

There are 2 type of user:

- Normal user.
- Admin user (Admins inherit all functions of a normal user).

Normal user	<ul style="list-style-type: none">- Login with email and password.- Sign up with email and password.- Forget/Reset password by sending email to registered email.- Set profile: display name, details information, avatar.
Admin user	<ul style="list-style-type: none">- Manage other normal users (lock/unlock or remove normal user accounts)- Able to access other users' chat history.

b. User basic communication

Users should be able to use the following features to interact with each other:

- View their friend list.
- Add/remove new friends with their username.
- Send direct messages among friends.

c. 3D AI characters

Users' avatar characters and AI powered characters should be customizable based on their demand.

- Users can import their 3D AI avatar from [Vroid Hub](#) or making themself ([Vroid Studio](#))
- The AI interacts with the user, responds appropriately and shows its emotion according to chat content (happy, sad, surprise, relax, neural,angry).

d. Online Interactive chat room (LAN)

Users can create chat rooms in specified ip/port. Others join the room by ip/port

For all user joining room:

- Choose a 3D character.
- Send messages with others in the room.
- Character movement in room.
- **Interact with environment and other users:**
 - User can express emotion via 3D character (happy, sad, surprise, relax, neural, angry)
 - Some animations like: applause, waves, dancing,...
 - Users can build the playground by putting furnitures, decorations.
 - Host mini game.
 - Host virtual meeting:
 - Show image on virtual 3D world (like ppt)
 - Draw on whiteboard on virtual 3D world
 - Host voting

For hosting user:

- Manage who can join (friend/ anyone).

4. Competitors & Differentiators

a. Competitors:

There are 2 main fields which we are competing in: interactive chat room and 3D chatbot. Here are some of the competitors on the marketplace:

i. Interactive Chat Room:

	Pros	Cons
VRchat	Strong community, expanded user base and various customization options.	VR devices are required for full experience. While PC versions exist, the platform is not designed for mobile.
Gather.town	Browser based, easy accessibility, user friendly	2D graphics, performance affected internet quality.

ii. 3D chatbot:

	Pros	Cons
avatar.one	Users can import custom characters.	The page is still on beta version with bug issues, terrible UX design.
yourgpt.ai/chatbot/avatars	Still on beta version, coming soon, currently unavailable.	

b. Differentiators

Interactive Chat Room: we offer a simple, 3D world interaction chat room experience, while VR devices are unrequired. We aim for the ability to host in LAN for offline users and increased privacy.

3D chatbot: users can import custom characters, they can also interact with the bots while chatting with each other.