Parallel Dance: A Social Game on Campus Public Screens

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Abstract—**Parallel Dance is a social game on campus public screens based on motion capture, which provides a platform for students to find new friends. We propose a multiplayer game model, in which players participate in the same game cross space and time. We focus on helping students overcome social shame, lack of self-confidence, and language barriers in this social game. We designed and implemented Parallel Dance, and deployed the game on campus public screens which are networked by cloud server. Participants can gain not only fun in the game, but also friendship.**

Keywords—game design, bodily play, social game, motion capture

I. PROJECT BACKGROUND

Campus social activities are quite popular in universities nowadays. In order to promote mutual understanding and expand the circle of friends among students, especially those freshmen who have just entered the university campus, a variety of social activities are widely organized on the university campus. We designed an interesting interactive social game for campus social activities. In this social game, strangers in different time and space play a dance game together. When players finish the game, they can choose the person they are most intrigued by and get the contact information. In our previous interview before making the game prototype, almost all the respondents said that it would be fun to meet new friends through an interactive social game on campus.

There are usually many public screens on university campuses, which are mainly distributed in teaching buildings, gyms, cafes, etc. We added computer hosts and motion capture devices to these screens, then they can be transformed into our game equipment - interactive screens.

We propose a campus multiplayer game model and design a dance game. Students enter the dance game through virtual avatars to find new friends. The game prototype was tested in the Motion Capture Laboratory of Tsinghua University, and assessed by In-Game GEQ Scale. We implemented the Parallel Dance game on campus public screens.

II. CONCEPT AND DESIGN

A. Game Concept

We believe that the key to social activities is to find the tacit understanding between people, so our game design aims to provide a virtual environment to let participants find the person that they are intrigued to most, the game conceptual prototype is shown in Fig. 1. We propose a relay game mechanism, in which players in different space (even different time) must complete the game process together. We use the cloud server to break the limitation of space and allow players to complete the dance game together when the communication channels are limited. When strangers meet face to face, it is often the case that people do not show their true personality. But when people are in different space and interact through virtual avatars, the situation will be very different. People will show their true self in the process of dancing with music in a virtual environment. When the information exchange channel between players is only to follow the same music to make dance movements, players can find the people who have a tacit understanding with themselves.
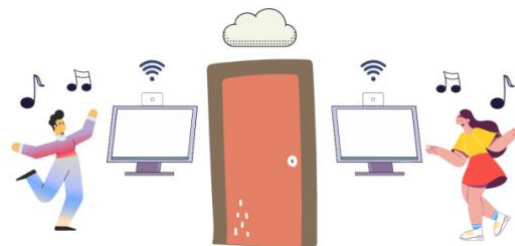

Fig. 1. Game conceptual prototype.

Shyness and the lack of self-belief prevent many students from participating in campus social activities, or have a negative impact on the effect of activities[1,2]. Appearance and body shape are often regarded as important factors related to social popularity, and people are often anxious about it. Our game design aims to avoid the bad influence of these factors in the process of making friends. In Parallel Dance, participants can only interact with the players' avatars during the game. We provide several avatars for participants to choose freely. The shapes of these avatars is independent of the participants' own body shape. The students of universities are from different countries and races. The university campus is a place that brings together different cultures and races. Dance can express different cultural characteristics with unique dance styles. Therefore, dance is one of the effective ways of cross-cultural communication. Our game encourages students to express their emotions and characteristics with exaggerated dance movements as much as possible.

B. Game Design

Parallel Dance is a dance game that players dance to the rhythm. As shown in Fig. 2, players can freely make dance movements according to the rhythm of music, and the dance movements they made need to avoid a random-motion ball in the scenes. Interactive feedback is very necessary in social interactive games[3], so we designed a special mechanism that the virtual environment can respond to the players'

dance movements. When players make more exaggerated dance movements, the game environment becomes more gorgeous.

Fig. 2. Game scene

Relay game means that the whole game process needs to be completed by multiplayer. Unlike ordinary multiplayer online games, relay games are a process in which players participate in the game in order. Participants cannot complete the whole game process alone and can only participate in the dance for a period of time to become the protagonist. When the dance time of the participant is over, he will watch the dance of other participants as a viewer. Multiplayer will complete the whole dance of the music together.
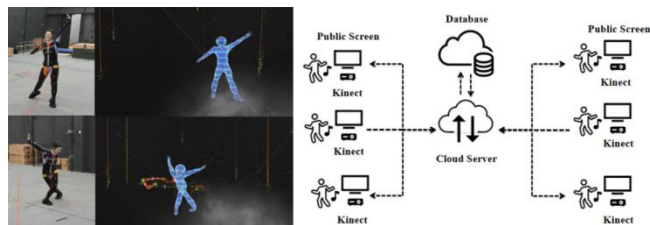

Fig. 3. Game prototype play test with optical motion capture device.

Fig. 4. Data flow

III. ASSESSMENT

In order to improve the quality of motion capture, we used professional optical motion capture device in the game prototype stage, and the game prototype test was carried out in the Motion Capture Laboratory of Tsinghua University. We invited six participants to participate in the play test and iterated the game design according to their feedback. We distributed the In-Game GEQ Scale to six participants after the play test, as shown in Table Ⅰ.

TABLE I: IN-GAME GEQ SCALE

No.	Question
1	Impressed by the game
2	Forget everything else while playing the game
3	Fully engaged in the game
4	Feel satisfied
5	Feel a sense of achievement after completing to finish the game
6	Feel fine
7	Feel bored with the game
8	Difficult to master game skills
9	Feel depressed during the game
10	Feel anxious during the game

The results show that Parallel Dance is a game that impresses its players and makes them fully engaged, as shown in Fig. 5. Then we program the motion capture logic on Kinect so that the game can be deployed on campus.

IV. IMPLEMENTATION

After adding computer hosts and Kinects to the public

screens on campus, we connected them through the cloud server to realize the communication between them. Considering that players do not necessarily participate in the game at the same time, players' actions are recorded in the database. When the player enters the game, the screen will first prompt the player to randomly obtain a music clip participating in the dance. During the game, the interaction with the player may be with other real-time players or the records of other players in the database. According to players' feedback, we found that the mechanism does not affect the players' interactive experience. On the contrary, in our interview, players said that unknowing whether each other are real-time players or past players adds a sense of mystery to the game.
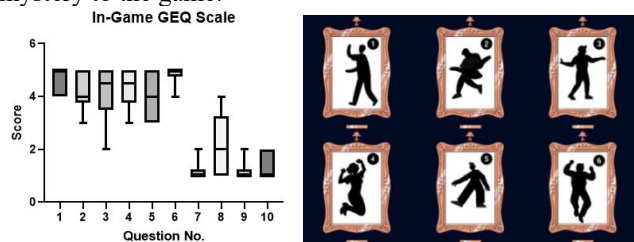

Fig. 5. In-Game GEQ Scale results of play test.

Fig. 6. Game screenshots of selecting a participant to get contact information in Parallel Dance

Before the game starts, participants are prompted that this is a social game and agree that other participants get their contact information. Our game tests are approved by the ethical review of Tsinghua University. After finishing the game, participants will enter the selection interface, as shown in Fig. 6, and choose a participant based on their observation during the game and obtain the contact information.
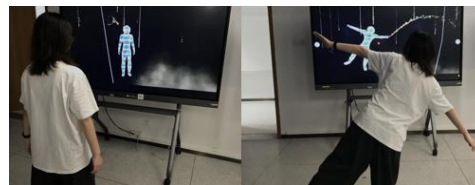

Fig. 7.Students play Parallel Dance on campus public screens.

V. CONCLUSION AND FUTURE WORK

This paper presented the design of a social game model to help students make new friends on campus. We designed and implemented Parallel Dance, a social game, on campus public screens and made an assessment. In the future, we will design a set of algorithms to evaluate the degree of tacit understanding between players to help players choose the person they want. As an anonymous social environment, the game can also be used in other disciplines, such as some psychological experiments.

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