

Augmenting Trading Card Game with Empathetic Virtual Characters

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Abstract. In this paper, we present *Augmented Trading Card Game* that enhances remote trading card game play with virtual characters used in the stories of popular animations and games. We show some observations about the way players use the system, realizing the game, and what their feelings and impressions about the system are. The obtained results are useful to consider how to use empathetic virtual characters in the real world's activities for future information services.

Keywords: Virtual characters, Empathy, Game design, Ideological metaphor.

1 Introduction

Virtual characters are widely used in our daily life nowadays. For example, famous Disney characters like *Mickey Mouse* and *Donald Duck* provoke our empathetic feelings easily anytime and anywhere, and *Kitty* and *Pokémon* are now found all over the world [1].

In animations and games, each virtual character has its own personality and story, which can be used as a medium to convey special information and messages to other people. If people are familiar with the story of an animation or a game, then they recall the leitmotif of the story with a little information by performing some action/interaction with the character. We believe that this observation is very important while considering how to use virtual characters in various future information services in the real world.

In the contemporary Japanese society, for example, several posters for public service announcements have adopted the idea to use virtual characters from recent popular animation stories. *K-ON!* has been used for promoting a national survey in Japan [10]. In the story of *K-ON!*, high school girls try to realize their dream with cooperative efforts among them. This becomes a persuasive message conveying the meaning that everyone's participation is important for the national survey. Also, NFGD that promotes guide dogs' training has created two posters using characters from *Puella Magi Madoka Magica* [12]. The girl that has been used in the first poster is a rebellious, but considerate to her friends, girl. The other girl that has been used in the second poster feels her friend in her mind even though the friend lives far away. These girls are admired by many young girls at the present time. If people want to imitate these magic girls, then the posters contain the strong persuasive message that becoming a puppy walker is one of the ways to become like them.

This paper presents *Augmented Trading Card Game (Augmented TCG)* for playing the *Yu-Gi-Oh! Trading Card Game (Yu-Gi-Oh! TCG)* between two players who are located in different places. The system, realizing the game, supports the remote trading card game play against virtual characters. In this system, we consider two possibilities and approaches to use virtual characters. The first one is to show a virtual character representing the opponent player. The second approach is to include a virtual character, drawn on one of the player's cards, that communicates with the player, and encourages him/her to win the game. We conducted a user study in which we observed the participants' behavior during the play, and interviewed them after that.

There are several other systems that support remote TCG play. *Duel Accelerator* [9] is an online-based *Yu-Gi-Oh! TCG* where each player chooses an avatar that identifies him/her from the other players. Also, the *Skype duel* uses Skype to show each player's card on the opposite player's display and the voice communication between the two players is possible as well. *Augmented TCG* uses 3D virtual characters that are shown to the players and move according to the opponent's current play and behavior. In this research we are interested in what is the impact of the behavior of the 3D virtual characters on the player's emotions and feelings, and the play of the game.

In *Augmented TCG*, we use popular virtual characters that have been used in Japanese animations and games. Especially, the *Yu-Gi-Oh! TCG* has been originally introduced in the *Yu-Gi-Oh! comic* and *animation*. One of the reasons why *Yu-Gi-Oh! TCG* is popular in Japan is the fact that almost all young people have first enjoyed the animation and comic story and then learnt how to play the game from the story. Moreover, the story teaches some important ideological concepts such as the importance of justice, friendship, bravery, positivity, and thoughtfulness. That is why we believe that the characters of the animation story can be used to enhance the playing style of the game through the stories they carry and recall.

2 Yu-Gi-Oh! Trading Card Game

The *Yu-Gi-Oh! TCG* [14] is a trading card game based on the *Duel Monsters* game that is portrayed in the popular *Yu-Gi-Oh! comic*. *Yu-Gi-Oh! cards* are categorized into three types: *Monster*, *Spell* and *Trap* cards. A *Yu-Gi-Oh! TCG*'s player structures his/her own original deck by selecting his/her favorite cards from the several thousands *Yu-Gi-Oh! cards*, currently released. This leads to each user having his/her own unique original deck that reflects his/her own personality and taste.

Yu-Gi-Oh! TCG is a turn-based game, which is played in a one to one or two to two manner. We call the battle with *Yu-Gi-Oh! cards* a *duel*. Each player starts the game with a certain number of points called *life points* and performs the duel by summoning his/her monsters, battling against the opponent with his/her monsters or using spells and traps. Depending on the action taken and the outcome of it, the Life Points decrease or increase. If the *life points* of the opponent player become 0 or the opponent player cannot draw cards from his/her own deck, then the opponent player loses the duel and the game ends.

The *Yu-Gi-Oh! TCG* involves various sources of pleasure besides just playing, such as completing collections of cards, structuring decks, communicating with the opponent players, trading, battling, as well as establishing different links to *Yu-Gi-Oh! TV animations* and *Yu-Gi-Oh! comics*. Moreover, although computerization has

advanced a lot currently, the version of *Yu-Gi-Oh! TCGs* that does not use a computer but paper cards is still very popular among players.

3 Augmented Trading Card Game

3.1 Overview of Augmented Trading Card Game

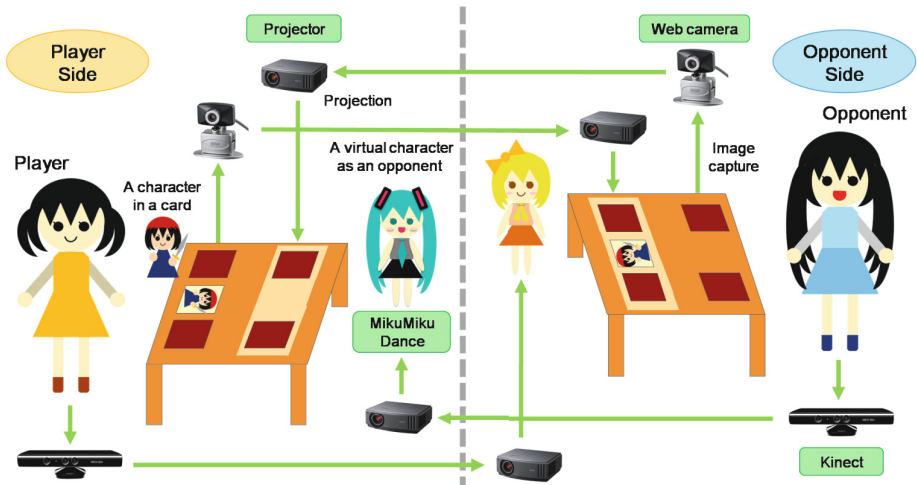


Fig. 1. Augmented TCG System

Augmented TCG enhances the remote trading card play performed by two persons. The basic design approach is similar to the augmented reality games introduced in [6]. As shown in Figure 1, the two players are located in different places. Each player's cards in his/her duel field on the table in front of him/her are captured by a camera and projected on the opponent player's table. Also, each player is represented as the 3D model of a virtual character used in popular animations and games, and this character is shown to the opponent player. In the current implementation, *MikuMikuDance* [11] is used to show the 3D models of virtual characters. *MikuMikuDance* is free software for creating 3D movies by using virtual characters. The virtual character is controlled using *MS Kinect*, its movement is synchronized with the movement and the behavior of the opponent player. In the current *Augmented TCG*, a player can choose one of three virtual characters that are *Yugi* and *Kaiba* from the *Yu-Gi-Oh!* animation story, and *Link* from *The Legend of Zelda*. In the *Yu-Gi-Oh!* animation story, *Yugi* is always surrounded by many friends and his winning success is a result of his strong bonds with his friends who love the trading card game. *Kaiba* is a lonely hero and he always seeks the strength in the game, but he does not accept other person's help even if he is in a critical situation. However, he also finally understands the importance of friendship. Most young boys want to follow either of these two characters because they have very typical ideal personalities that are very attractive to most boys. The reason to choose *Link* as the third character in our experiment is that we would like to investigate how a favorite character from another unrelated to TCG story affects the attitude of a

player. Also, while playing the game, another virtual character depicted on one of the player's cards appears on a small display near the player once that card is drawn out of the deck, and supports and encourages him/her to win the game until the end of the game. Moreover, the two players can communicate with each other via Skype if desired, and thus it is possible for them to introduce each other directly instead of using virtual characters. This option will allow us to compare the case of the players communicating with each other through virtual characters and the case of the players directly communicating with each other.

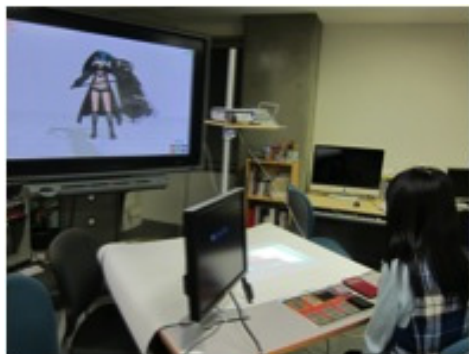


Fig. 2. Current Prototype Configuration



Fig. 3. Encouraging a Player by a Virtual Character

One of the authors has more than 10 years' experience in *Yu-Gi-Oh! TCG* and has more than few thousands *Yu-Gi-Oh! trading cards*. For the experiments presented in this paper, she has created a special deck as the participants have used the cards in a controlled manner and the rules have been simplified for making the duels shorter. She is also very familiar with the animation story, and knows how each character structures the deck and uses the cards in the animation. So, the deck used in the experiment has been structured depending on the character that the player has chosen to play with. However, in the current experiment, the virtual character's behavior does not reflect the real behavior of the opponent player exactly. Another person imitates the behavior of the opponent player and this behavior is sometimes over-reacted in order to be closer to the actual character's behavior in the animation.

Figure 2 shows the current prototype configuration for a participant. On a large display, a virtual character which behavior is synchronized with the behavior of the person who imitates the opponent player is shown. A camera is setup behind a small display near the participant, and captures the image of the cards. The opponent player's cards are projected by a projector that is installed on the table. A small display shows the other virtual character depicted on one of the player's cards, which in this case is the one of most powerful cards in the participant's deck.

Currently, we recruited five participants for our experiments, and they played all the experiments with the same setup. This means that they used the same predefined deck for controlling their plays in a predictable manner. Also, an opponent player is one of authors, and she has deep knowledge to control the game in the experiments. Most of the

young participants have more than three years' experience in *Yu-Gi-Oh! TCG* and they know the characters that appear in the animation stories very well. During the experiments, we observed each participant's play and conducted interviews with them after their plays. Before the experiments, none of the participants knew about *Augmented TCG*, and they were told how the rules were simplified right before the experiment.

3.2 Playing against a Virtual Character

We did two experiments for playing *Augmented TCG* against a virtual character representing the opponent player. In the first experiment, participants could choose either *Yugi* or *Kaiba* according to their preferences.

After the play, we interviewed the participants. One of them said: *"I could feel I am playing against Yugi, but Yugi used in the experiment does not offer enough reality"*. Especially, the movement of the character was sometimes not like the real movement of *Yugi*. He said: *"I will definitely enjoy more the game against Yugi, and would like to win the game if the movement is more realistic"*. However, another participant said: *"The face expression of the character is poor and it is a very important issue while playing a game against a real person"*. Also, one of the players told us: *"The voice should be the same as the actor's voice of the character in the animation story"*. Especially, if the opponent player was a female, some participants felt strange since both *Yugi* and *Kaiba* were male characters.

In the animation story, players usually play TCG while standing, that is why we choose that the characters are always standing during the play, but in the real situation, a player usually sits down on a chair. Some participants feel the unreality on the behavior of the characters, but if the characters just sit down all the time, the participants also feel the inconsistency with the *Yugi* and *Kaiba*'s personality.

In the second experiment, *Link* from *The Legend of Zelda* [13] was used as a character representing the opponent player. The results in this case were completely different depending on whether the participants liked this character or not. If the participants were not interested in *Link*, they usually did not care about the presence of *Link*, but if *Link* was their favorite character, then they found playing the game with *Link* more enjoyable. One of the male participants also told us: *"If the character is a pretty girl, I may be more excited to play the game"*. Also, a female participant told us: *"I feel that Link is my boy friend, so playing against him increases my pleasure and positivity"*.

Finally, we also compared the effect of using a virtual character with a real person. In the experiment, *Augmented TCG* shows the figure of an opponent player directly using Skype. The result of the experiments will be discussed in the next section.

3.3 Encouraging a Player by a Virtual Character

In the experiment, a small display on the table shows the virtual character depicted on one of the cards used by the participant as shown in Figure 3. We have selected *Dead Master* from *Black★Rock Shooter* [8] as a character to be depicted on the card because we feel that the character does not contradict with or violate the atmosphere of *Yu-Gi-Oh!*. *Black★Rock Shooter* has two worlds. *Dead Master* is an enemy of *Black★Rock Shooter* in another dimension world, but in the daily world, they are very

close friends. This becomes a persuasive message conveying the meaning that players need to keep and develop their friendship even if they fight seriously in a game.

In this experiment, we structured a special deck in advance, and all participants used the same deck. Then, in the duel, the participant always drew the card depicting *Dead Master* at the beginning of the game. Once that card has been drawn out of the deck a small display next to the player showed *Dead Master* that remained present until the end of the duel. *Dead Master* supported and encouraged the player during the game by using a body gesture for encouraging people and its behavior was controlled by a person who operated *MS Kinect*.

After the experiment one of the participants said: "It is desirable that the card depicting *Dead Master* does not lose from the attack of the opponent player". However, another player who was not interested in the character told us: "It is more enjoyable if the participant's favorite character encourages him". One of the other participants said: "I feel that the character does not encourage me enough using only gesture. It is better that the character talks or advises me". He also told us: "It is desirable that the character behaves like a cheerleader". *Dead Master* is a serious character, so if that character just behaves as a cheerleader, some players may feel the unreality due to the loss of the consistency with its animation story. Also, another participant told us: "The encouragement should be like the one in the animation story". Most participants said: "The presence of the character increases the pleasure, but it is hard to consider winning the game just from that encouragement". The participants' comments showed that they were aware that exactly the character depicted on one of their cards appeared on the small display without them being informed in advance about this feature of the system.

4 Design Implications

Most of the participants who have watched the *Yu-Gi-Oh! animation* story feel that adding popular virtual characters from the animation makes the game more enjoyable. The desire to follow and imitate these characters becomes also an incentive for the users to change their behavior. A negative feedback may be used to achieve moral play, but changing a user's attitude in general is not easy [4]. The most important insight is that there is a possibility to use a virtual character as a metaphor that recalls the story of the character in the player's mind while gaming, and in this way the story may convey the leitmotif containing ideological concepts like the importance of friendship, honesty, thoughtfulness and so on. This approach would have the power to change the player's attitude.

Reality is an important criteria to evaluate a design [5]. In our case, the virtual character's behavior should be consistent with the character's behavior in the animation story and this is of significant importance to feel the reality in the game. For example, cards that are not used by the character in the animation should not be used in the game as well, and the movement of the virtual character should be consistent with its typical movement in the animation. The number of cards owned by the character should be consistent with the real game situation. A gap between the reality and the virtuality may cause the uncanny valley problem [3].

In the second experiment, the chosen virtual character is not well known to the participants but it may cause a feeling of incongruity in the players while playing

Yu-Gi-Oh! TCG if they are aware that the character appears in another animation story that is unrelated to TCG. Also, we believe that participants would be more excited to play the game if a character drawn on a card used in the player's favorite deck is shown to the player. However, the results are different according to the player's gender. A female player usually likes a card depicting a pretty or beautiful girl. In this case, encouraging the player is more natural and meaningful. On the other hand, a male player usually likes a powerful card that may depict a strong monster. In this case, the special effect to show the superior ability of the character is effective to motivate the player.

When playing against a virtual character, the player also tries to mimic the character in the animation story. This is very useful to teach how to improve the player's gaming skills. If players are immersed in a virtual world to play against a character in the story, they can concentrate more on the game. Of course, a skillful friend is a good coach for improving a player's skills, but if there is no good coach near the player, he/she needs to learn by himself/herself. Also, a player feels high credibility on coaching by a skillful character. Thus, he/she becomes enthusiastic to learn new skills from the character.

We also compare the case of the player directly seeing his/her real opponent player with the case of using a virtual character to represent the opponent player. From the interview we have found that if a participant knows the opponent player well, the real person view is more preferable and increases the reality of the game, but when the opponent player is a stranger, some of the participants claim that using virtual character is preferable because they do not feel comfortable either showing themselves or seeing the opponents. This is an important issue because the difference in the personalities may cause different results. Designing social information services always needs to take into account the differences in the personalities in order to satisfy a larger number of users.

In our experiments, we could not find the rigorous evidence that the stories of the virtual characters could strongly affect the attitude of the players. One of the reasons is that in our current research we focus on a game. For most people, the purpose of a game is just for fun. Of course, the duel against *Yugi* and *Kaiba* makes players play the game more seriously, but it is hard to make players braver when *Link* is shown as an opponent players. *Link* is a character in an RPG game, and a male player considers that the character is just like his avatar in the game, so his story does not have strong ideological messages in the game. Also, the presence of *Dead Master* does not have a strong impact on a player, since the character itself is very popular, but its story is not so well known yet. This means that well known stories that contain strong ideological messages and characters that have strong and distinctive personalities are important to make virtual characters be used as metaphors. We also consider that the music used in the well known stories could also become a metaphor for the stories because in Japanese animations, their music sometimes becomes more popular than their characters. We are interested to enhance the framework to design values in products and services [5]. We believe that designing metaphors that use the popular stories in animations and games is a promising future direction to convey complex ideological messages to people without presenting a large amount of information to them.

One of the problems in using virtual characters is their copyright issues. There are many free 3D models for *MikuMikuDance*, but some of them are deleted on the Web due to the copyright issues. However, freely available models offer new possibilities to

enhance games because the models can be easily customized. In Japan, it is a popular culture to create new characters and stories from existing ones. Using a customizable virtual character in *Augmented TCG* may create a new playing style of TCG, and the new stories of the character can be used to enhance its role as a metaphor.

Many Japanese animation stories emphasize on the importance of positivity, which is very useful to make our life more meaningful [2]. Thus, the characters in the stories can be used as metaphors to increase human's positivity while playing a game. It is one of the most important roles of a game to teach solutions to typical serious problems in our life.

5 Conclusion

This paper presents some observations on the usage and the design of *Augmented TCG* that enhances remote trading card game play against empathetic virtual characters.

Our approach is also useful to enhance gamification [7] with virtual characters. The current gamification design focuses on how to offer incentives by using game mechanics. Such approach is useful to increase extrinsic motivation, but it is hard to increase intrinsic motivation. Our finding is that a virtual character can be used as a medium to convey ideological concepts efficiently, and this can be used to change a user's attitude to keep his/her obtained good habits for a long time.

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