

PLAYER MANIPULATION

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ABSTRACT

Video games are capable of giving the players a better entertainment experience due to the interactivity as compared to passive media like movies and books. The overall quality of the entertainment experience is highly dependent on the quality of the game content. Given that video game developers are only able to create a finite set of good quality content for the player to experience and that content that is not experienced does not contribute to the player's entertainment experience, there is a problem where game developers have to direct the player towards game content and meaningful gaming experiences while not sacrificing the interactivity of the game. In this paper, we propose solutions to this problem by studying manipulation concepts in other areas, classify the concepts into a portfolio of manipulation techniques that can be used in games, and conduct some preliminary experiments, which indicate that an implementation of the techniques is not as simple as one would imagine.

INTRODUCTION

The term "manipulation" used in this context means to influence persons to do what we want them to do. The type of manipulation that we are interested here is *subconscious* manipulation, i.e., the target should not consciously realize that any influencing is taking place. In other words, we don't want the player to consciously know that they are being manipulated. When we use manipulation techniques, we want to exploit psychological techniques in a way such that, for example, a compelling reason is created for a player that makes the player select a particular response towards a particular situation.

As such, the manipulation techniques found in this paper are derived from psychological techniques practiced in areas like marketing and retail. These techniques rely on the fact that we usually develop a preprogrammed set of actions for ourselves for a particular situation so that we can apply these actions without having to think through the situation (Cialdini 2001). For example, we usually extend our right hand to shake hands with people we meet for the first time. This action is driven by the need to appear courteous in front of the person and is automatically triggered as the most

appropriate action to take when faced with this situation. Using the psychological techniques found in other literature as a basis, manipulation techniques that can be used in the gaming context are developed.

In the next section, common in-game actions are classified into categories that will be used to discuss the application scope of the manipulation techniques. This is followed by the details of the developed manipulation techniques.

CLASSIFICATION OF PLAYER ACTIONS

Guiding the player to make decisions in a certain way requires distinguishing different actions from one another. Some techniques are more effective in influencing certain types of actions than for others. The actions that a player might make vary from game to game depending on the genre as well as what type of game it is, and it is impossible to list all of the possible actions exhaustively. Instead, actions that are found commonly in games will be grouped together under a category based on the game design needs. This classification will serve as the basis of categorization of the example implementations for each manipulation technique later on.

Movement

This category includes movement actions that the player can make, for example, moving the player's avatar around in the game world, like in a first person shooter (FPS) game or role playing game (RPG), moving the player's units in a real-time strategy (RTS) game, and moving objects in games where the screen does not move, like Tetris. Reasons as to why these actions warrant discussion is that certain storylines require the player to venture into a particular place before the event can happen; hence it would be beneficial for the player's gaming experience if that location is visited at a particular time during game play.

Resource Acquisition

Resources acquisition actions can be exemplified by picking up loot after slaying a monster in an RPG, picking up ammunition in an FPS, gathering resources in an RTS, consuming bonus items and collecting power-ups in most simple casual games, etc. There would be instances where the player is needed to pick up certain items that enhance the playing experience either by providing assistance to the

player's current status or increase the player's sense of achievement when that particular item is collected.

Combat

This category consists of any kind of combat-related actions that include attacking or casting offensive spells on a monster in an RPG, shooting at enemies in an FPS, attacking another player's base in an RTS, etc. There are for example times when a particular entity has to be destroyed in order for the storyline to progress, and we need to get the player to perform these kinds of actions.

Accepting Requests

Among the most powerful type of actions that could be influenced is the acceptance of a request. While request acceptance is in most cases not the target action itself, following a request lead to the series of actions that results in the player experiencing various game content. Rather than trying to influence one action at a time, accepting requests can take players to the desired location, to pick up key items and to engage in combat with someone within the same context. Requests appear most often in RPGs as quests, and are fundamentally the same as missions commonly seen in FPSs and RTSs.

The next section covers the manipulation techniques, the implementations, concepts and some examples of possible implementations in games.

MANIPULATION TECHNIQUES

In this section, we propose a set of manipulation techniques. As mentioned above, these techniques are developed using psychological techniques found in other literature. The adaptation of the techniques is done by extracting the fundamental concepts that make the psychological techniques work, and modify them such that they will make sense in the gaming context. These concepts normally entail some requirements that must be fulfilled to be successfully applied, which also brings about difficulties in implementation in a gaming context.

A preliminary experiment was conducted using the techniques listed here to gain insights in the effectiveness of the adaptation of the techniques in influencing the player's actions. The techniques were implemented according to one of the described example implementations in a test scenario (a specially crafted Warcraft 3 scenario with a storyline). A total of 10 test subjects were chosen to participate in this experiment. They were chosen in a way to cover various demographics types, i.e., gaming habits of casual and hardcore, and different genders. Note that the results of the tests cannot be taken as a confirmation or rejection of the general techniques as they only exemplify one specific implementation. The tests also provide insights as to how the testing of the techniques can be implemented and be further improved.

For each technique, we will describe the general technique implementation, the concepts behind the proposed technique, implementation requirements, difficulties, and some examples of action specific implementations followed by the experimental results.

Commitment

For this technique, questions are to be asked to the player. The answers serve as a kind of commitment to the player, making the player responsible for holding true to his/her commitments, and thus perform actions that remain consistent with the commitment made. An example of such a question would be the player's views towards a subject, like liking of a particular non-player character (NPC) in the game. Then, if the player is presented with a kind of situation that is related to the commitment, we expect the player to choose or act in the way the player answered the commitment question before. The questions can for example be asked through a dialog or menu selections.

Concepts behind This Technique

People have the tendency to believe strongly in the things they have committed to, and they will remain consistent to what they have committed (Cialdini 2001). Making use of this mentality combined with other techniques like rational persuasion or getting the person lean towards a particular decision (Yulk and Falbe 1990), we can influence players in a video game to make a desired commitment for the commitment question and then have them adhere to this commitment with consistency.

Requirements and Difficulties with Implementation

The game must have some way of asking questions, like dialogs, and the player must have a means of making a decision, like pressing buttons for selecting different options.

Difficulties with the implementation arise with the additional dialogs to survey the player's preferences, which may disrupt game play, and that additional techniques may be needed to influence the player to choose the desired choice. A possible remedy for the second difficulty would be designing the game such that all the possible choices the player result in actions that are desirable.

Action-Specific Implementation Examples

Below are the example implementations for each action category this technique is capable of influencing.

Accepting Requests: To influence the player to accept quests given by a particular group of NPCs, the questions could be formulated in a way that would cause the player to commit to help this group of NPCs. Examples would be: "When asked for help by (a particular kind of NPC), would you help him or her?" or "Would you help the (a particular kind of NPC) when asked?"

Combat: To influence combat related actions, like attacking a type of NPCs unprovoked or avoid fighting with some kind of monster that the player is too weak to fight against, the question could be if the player would show hostility towards

or avoid engaging certain groups of NPCs or the like. For example: “When faced with a stronger opponent, will you try to fight or to escape?”

Resource Acquisition: To influence the player to collect or gather a particular kind of resource that the player will need at a later point in the game, the question could be framed in a way that the particular resource is viewed to be in demand and then ask if the player will stockpile it. For example: “The price of (the resource) has risen considerably recently. Everyone is trying to get hold of it. Would you try to get your hands on (the resource) when you get the chance?”

Movement: To get the player to move to a certain place in the game using this technique, the question asked can be designed such that it mentions some characteristic of that location that would entice the player to go to that location. An example would be: “I hear that (the particular location) is a beautiful place. Wouldn’t you want to visit it?”

Results

Implementation Tested: Accepting Requests

Method of Testing: The player was asked by an NPC for his/her opinion on the types of critters that are present in the scenario – whether they like or dislike them. These critters can be found all over the game. The question serves to survey the player’s personal preference about seeing these critters. Thereafter, the NPC will ask if the player would partake in a quest to reduce the number of these critters due to a problem with overcrowding. The success of this implementation is determined by the pair of answers the player chooses; a success would be the like/refuse to kill and the dislike/kill pair of answers.

Sample mean, \bar{X} : 0.556

Probability of success, μ at 90% confidence level:

$$0.229 < \mu < 0.882$$

Discussion

From the empirical test results, the tested implementation of this technique does not display the effectiveness in manipulating players nor shows any capabilities of influencing the player’s follow-up attitude of the task, which deviates from the initial expectation. Reasons for this effect might be that the critters are merely decorative and do not affect the player, like attacking, giving experience or loot when killed etc. The player may not have developed any feelings or even notice the presence of these critters to warrant a strong reaction towards them. For the experimental test, the second question would however then need to be decoupled from these feelings to provide a valid test.

Return Favor

Have a non-player character (NPC) provide unconditional aid to the player in times of need. Later, when encountering this NPC again, the player should feel grateful towards the NPC for the help and should readily accept requests made by that NPC. The type of aid should be very useful in that particular situation, such as a full hit point (HP) recovery when the HP level is critical, and also might not even be material, like advice to get the player through tough times.

Concepts behind This Technique

People tend to express gratitude when receiving things from others. This concept of gratitude is internalized within most of us, and we actively seek to avoid labels like “ingrates” (Cialdini 2001). Exploiting this mentality to reciprocate, we can influence players to do things they would not do otherwise.

Requirements and Difficulties with Implementation

The game must be able to support NPCs, and the gratitude generated, which is the key factor of influence, has to be targeted at a specific entity or a group of entities. Without such entities, it will be very hard to invoke such feelings. In addition, as the action category being influenced is request acceptance, there is a need to support dialog as well as decision making in the game.

A difficulty for an implementation is the required additional scenes for the aid-providing event, adding more workload and time for the game developers for designing the scenes, debugging, etc. Measures must also be in place to ensure that the player triggers the aid-providing event, perhaps through the use of other manipulation techniques.

Action-Specific Implementation Examples

Below is an example implementation for the action category that this technique is capable of influencing.

Accepting Requests: To influence the player into accepting requests, one can implement an event where the player receives help by a specific NPC. For best results, one should provide help when it is critically needed to increase the sense of gratitude. Subsequently, one can present the player with a request by that same NPC that helped the player.

Results

Implementation Tested: Accepting Requests

Method of Testing: The player was placed in a situation where the player’s character is being chased by enemies. An NPC helps the player by providing a hiding place for the player and his companion, and leads the player’s enemies down a wrong path. After speaking to the NPC again, the NPC will have an option labeled “Return the Favor” which begins a quest, signifying the player is returning the favor by helping the NPC. The success of this implementation is determined by observing if the player chooses to accept the quest to return the favor.

Sample mean, \bar{X} : 0.7

Probability of success, μ at 90% confidence level:

$$0.420 < \mu < 0.980$$

Discussion

From the experimental test results, the tested implementation of this technique does not hint to the effectiveness in terms of player manipulation. Although the sample mean is high, the confidence interval has a lower limit of 0.420, which means that there is a chance that the actual probability of success is below 50%. Based on the results of a control experiment, the player may have chosen to accept the quest regardless of the aid. However, due to the small number of test subjects that triggered the control test, this inference may have no

significance when tested with a large population of test subjects.

Time Pressure

Certain events in the game, where we want the player to participate, are only to occur for a certain interval of time, after which that same event has a lesser or no chance to occur again. The player should thereby be tempted to participate in this event because he/she cannot do so later (unless perhaps some game time has passed). Influence can be achieved on the player's actions at specific times, and as an additional benefit, the game developers can thus predict the times when those actions are executed and incorporate this information into their planning of the game.

Concepts behind This Technique

This manipulation technique plays with people's sense of value of a particular object due to its scarcity. In this case, there is a time constraint placed on the ability to participate in a certain event. The player should value the opportunity to participate in the event higher than what he/she is currently doing due to its scarcity (Cialdini 2001), and hence will feel pressurized (Yulk and Falbe 1990) to participate in the event before the time limit expires.

Requirements and Difficulties with Implementation

For a game that is going to apply this technique, the information that the time-limited event is going to take place must be conveyed to the player for this technique to be successful. Additionally, it can be useful to have an active timer being displayed to let the player know the remaining time.

Difficulties arise as the game must be able to limit access to certain aspects of the game, so that the relative scarcity can be achieved. The events also must be planned ahead of time. Triggering can either be achieved automatically after a certain time has passed or after some requirements are met.

Action Specific Implementation Examples

Below are the example implementations for the action categories that this technique is capable of influencing.

Accepting Requests: To influence the player to accept requests, the time-limited event could be implemented as the quest giver either only appearing for a limited amount of time or such that the quest is given out only during a specific time interval. For example, the player may be informed that during an eclipse, a particular NPC will appear and that talking to this NPC will result in a quest; or that a quest will be given by a particular NPC during the eclipse.

Combat: To influence the player into fighting particular monsters or a hostile NPC or a group of NPCs at a given time, the time that the monsters may appear can be constrained to a one-off or repeating time interval, for example, monsters appearing only at night. The player, who only has a limited opportunity of engaging the monsters, would be tempted to seek them out during this given interval.

Resource Acquisition: The resource that the player is supposed to collect can be made to appear with a certain timing, after which the resource will no longer be available or the player will have to wait for the next window of opportunity.

Movement: To get the player to visit certain locations at a particular time, access to those areas in the game can be blocked off and reopened during a specific time interval. The player would then be notified of the opening of the location and will be tempted to visit it before the location is closed off again.

Results

Implementation Tested: Resource Acquisition

Method of Testing: Upon triggering the event, an NPC will appear, telling the player that a time-limited event is going to occur. The player has two minutes to go to the designated area and collect gold coins that will spawn for the duration. Success of this implementation is determined by whether the player heads to the designated area before the time is up.

Sample mean, \bar{X} : 0.714

Probability of success, μ at 90% confidence level:

$$0.356 < \mu < 1.072$$

Discussion

From the empirical test results, the tested implementation of this technique does not seem to be effective to manipulate players. Although the sample mean is high, the confidence interval has a lower limit of 0.356, which means that there is a chance that the actual probability of success may be below 50%. The result of this test thus cannot deem the influence of the technique to be valid. The upper limit of the inequality is even (above) 1.0, which is a result of the high variance due to the small sample size. This effect also occurs in other calculations in this section. One shortcoming of our example implementation is certainly also that there are other means of acquiring the resource in the game, and that the player is aware of these other methods of getting gold.

Environmental Cueing

Environmental properties of the things that the player should pay attention to can be modified such that those objects or areas become more salient. This will generate more interest from players, and they are more likely to perform actions on these objects or to the area. For example, having sounds or voices played certain locations should capture the attention of the player and causes him/her to investigate its source. Another possibility is the use visual cues to stimulate interest in the area or an object. Through the prolonged use of this technique, the player will eventually get used to the effect and – with a coupling of corresponding rewards for the player – will then automatically execute the corresponding actions. This learning of cue-actions relations may be desirable depending on the context as the cues can be reused with increasing effectiveness.

Concepts behind This Technique

This technique relies on the fact that people perceive slight differences between two similar objects as being more

different, thus more interesting and attention-grabbing, and ultimately influencing the player to become more aware of the surroundings and investigating the surroundings (Cialdini 2001).

Requirements and Difficulties with Implementation

The game must be able to present the necessary cues (visual or audio) to the player.

Difficulties in implementation include determining how salient the cues have to be to make them effective. If the cues are too salient, it might distract the player, while too subtle cues could be completely missed by the player.

Action-Specific Implementation Examples

Below are the example implementations for the action categories this technique is capable of influencing.

Combat: Certain hostile NPCs or monsters in a group can be changed to look or sound different, e.g., by adding an aura or some other minor details that sets them apart from the rest. Alternatively, unique music or sounds made by an NPC can be played when it appears.

Movement: In areas with hidden objects, NPCs or locations, special sounds or music can be played to attract the attention of the player and influence the player to investigate the area.

Results

Implementation Tested: Movement

Method of Testing: Upon entering a predefined region in the game, the player will hear a 3D sound being played. This sound is a human voice saying "Go away". Should the player move towards the direction of the sound, the player will find a hidden location with an NPC. Success of this implementation is determined by whether the player successfully locates the hidden area.

Sample mean, \bar{x} : 0.286

Probability of success, μ at 90% confidence level:

$$-0.072 < \mu < 0.644$$

Discussion

The empirical results of the tested implementation of this technique suggest that the test subjects were not affected by voices despite there being a dialog that hints the test subjects to attend to the voice. The sample mean is low for this implementation and the confidence interval has a lower limit of (less than) 0 which means that there is a good chance that the actual probability of success may be below 50%. The possible cause for this is that the cue is not salient enough to warrant interest in the player. Another thing to note is that the cue used in this implementation is an audio cue that conveys a message. The test is set up in a way such that the player is supposed to move to the area despite the message to prove that it is the cue and not the message that prompted the action. Visual cues, which are more salient than sound, may be employed with a greater success rate.

Group Influences

We can use multiple NPCs to influence the player to do a desired action by having these NPCs doing that same action in front of the player. Such demonstration events can for example be triggered when the player enters a new area, such that the player is not yet sure what to encounter.

Concepts behind This Technique

This technique makes use of the fact that people tend to follow what other people are doing in the event where they are not sure what is going on or unsure about how to approach a situation (Cialdini 2001). When the player sees many NPCs or other players doing a particular action, the player would likely also adopt the same behavior as the others.

Requirements and Difficulties with Implementation

NPCs that are to portray the action for the player need to be able to execute it, i.e., many more capabilities/animations may be needed for such NPCs.

Action-Specific Implementation Examples

Below are the example implementations for the action categories that this technique is capable of influencing.

Combat: To make the player feel the need to engage a particular enemy, one can have multiple NPCs surrounding a particular monster and attacking it.

Resource Acquisition: Having many NPCs using a particular kind of item, or letting the player see a scene of many NPCs collecting a particular resource, like gold mining, will influence the player to want to acquire that item/resource as well.

Movement: This implementation can be achieved by having many NPCs moving in a particular direction that leads toward the desired location that the player is to visit. The player should consequently want to move into that direction as well.

Results

Implementation Tested: Movement

Method of Testing: Upon walking into a predefined region, the player triggers a cinematic where three NPCs appear and begin walking towards a point that is outside the player's line of sight. The successful application of this technique is reported when the player moves towards the point the NPCs are moving to.

Sample mean, \bar{x} : 0.4

Probability of success, μ at 90% confidence level:

$$0.100 < \mu < 0.700$$

Discussion

The sample mean is very low for this implementation, and the confidence interval has a lower limit of 0.100, which means that there is a good chance that the actual probability of success may be below 50%. It can be inferred that the moving NPCs may not be an effective cue for this implementation and that the tested implementation does not

generate enough motivation in the player to follow the NPCs. There also may be a higher threshold of the number of NPCs required to influence the player.

Authority

By using NPCs that are perceived as leaders or experts for requests to the player, the player should be more agreeable to accept and follow through a task to the end. Examples of such leaders include scientists, squad leaders, a king, and basically any NPC who ranks higher than the player or NPCs who the player considers as superior (actual rank may not be important; qualities like experience etc. come into play).

Concepts behind This Technique

This technique is based off the fact that people tend to follow blindly to authoritative figures by assuming that the “experts” know what is best. There is also no need to prove the expertise of the expert. As long as the target perceives the person as an “expert”, they will follow through the instructions without question (Cialdini 2001). The extent of this blind obedience to authority can be seen in the famous Milgram experiment (Milgram 1974).

Requirements and Difficulties with Implementation

The “experts” take the form of NPCs. The player must be able to converse with the NPC and choose whether to accept the request or not. Hence the game that wants to apply this technique must also cater for these functionalities. Alternatively, experts can also be used for giving pure advice, and leave it to the player to follow it or not.

A difficulty in implementation is the need to turn an NPC into a believable expert, i.e., the NPC must be designed in a way that clearly displays the qualities of an “expert”. For example, by titles in the name, like “doctor”, or the physical appearance of the NPC, like a leader that is easily distinguished from the other men. The mannerism of the NPC may also affect the effectiveness of this technique. Additional design considerations may thus be needed for introducing “experts”.

Action-Specific Implementation Examples

Below is the example implementation for the action category that this technique is capable of influencing.

Accepting Requests: To influence the player into accepting requests made by a particular NPC, one can present the player with a request made by a NPC who fits the “expert” role. The request must be related to the perceived expertise of that NPC in order for the technique to work.

Results

Implementation Tested: Accepting Requests

Method of Testing: Upon triggering the event, a cut scene will play out, in which a group of six soldiers and their leader (distinctly different from the other soldiers) will march into the scene. The leader will stop and ask the test subject’s character if he would join them to eliminate some monsters. Success of this technique is determined by the acceptance of the request made by the leader.

Sample mean, \bar{X} : 0.889

Probability of success, μ at 90% confidence level:

0.682 < μ < 1.095

Discussion

This implemented technique fared better than many other techniques mentioned in this paper, as indicated by the high sample mean and the range of the probability of success. Based on the empirical results, it is inferred that players would react to requests given by a so called “leader” of the group of NPCs. Both appearance and mannerism (the way the leader speaks to his men and the player) were incorporated into the experiment.

Affective Musical Themes

This technique uses themed music to invoke feelings in the player to get them to react in the desired way. Examples include music with war drums to make the player feel like taking part in battle, or romantic music to get the player to interact with his/her love interest. Most games make use of music for experience enhancement, but they normally do not use it for the purpose of influencing the player’s actions.

Concepts behind This Technique

People’s moods tend to be affected by the music played in the surroundings (North et al.1999). Through this technique, we can get the players to develop certain feelings when we want them to. When people are in a certain mood, they tend to act according to how the general population acts when they are in such a mood (“feeling rules”), and we can influence the player’s actions accordingly.

Requirements and Difficulties with Implementation

Music is the key feature of this technique manipulation; the game that wishes to employ this technique must thus be able to support music playback.

Learning can be incorporated into this technique to make the player associate a theme music with certain emotions (see the section on environmental cueing). It may take some time before the technique can be used with efficiency, and it may be difficult to determine when enough learning has happened to generate a good response.

Action-Specific Implementation Examples

Below are the example implementations for the action categories that this technique is capable of influencing.

Combat: Musical themes that are related to combat can be played whenever combat takes place. At the desired point to influence the player to engage in combat, this music is played and the player should react by engaging in combat.

Movement: Fast or slow music could influence the player’s movement speed when transiting through areas where it would be beneficial if the player slowed down or hasten his/her pace.

Results

Implementation Tested: Combat

Method of Testing: The player is first taught to associate a sound with combat by playing a sound whenever the player engages in combat. Subsequently, when the player ventures into a predefined region, the sound will be played despite there being no combat. The success application of this implementation is determined by whether the player attacks a nearby group of monsters who are neutral to the player.

Sample mean, \bar{X} : 0.571

Probability of success, μ at 90% confidence level:

$$0.179 < \mu < 0.963$$

Discussion

The empirical results indicate that the tested implementation may not produce enough motivation to create the desired actions. The sample mean is close to 0.5, which may indicate that the implementation may achieve random successes.

Partner Requests

The player's partners can be used to make requests, which makes it hard for the player to refuse because of his/her relationship with them. Such NPCs includes party members, side-kicks, pets and love interests. These characters may accompany the player through most parts of the game; hence the player should develop some form of attachment to them and we can make use of this feeling of attachment to influence the player.

Concepts behind This Technique

The basis for this technique is the exploitation of the player's relationship with an NPC, which is formed throughout the game to influence the player. The acceptance rate for requests made by significant others is usually very high (Cialdini 2001).

Requirements and Difficulties with Implementation

Games without much interaction with NPCs and partners are obviously no good candidates for this technique.

Difficulties arise because this technique requires the player to build a relationship with the NPC, which requires a lot of effort to create situations where the player bonds with the NPC. The NPC must also exhibit mannerism similar to an actual person to make the relationship feel real enough to generate success. As relationship building takes time, the technique cannot be used on the fly.

Action-Specific Implementation Examples

Below is an example implementation for the action category that this technique is capable of influencing.

Accepting Requests: One can design an NPC that follows the player around, providing company to the player and building a relationship over time. The NPC then makes a request that the player should accept.

Results

Implementation Tested: Accepting Requests

Method of Testing: The player's character will be followed by an NPC throughout the game, playing the role of the player's love interest. This NPC will attempt to build a relationship with the player's character by conversing with the player about the various things they come across. Upon reaching the predefined area, the NPC will give a quest to the player. The success of this implementation is determined by whether the player accepts this request.

Sample mean, \bar{X} : 1.0

Probability of success: N.A.

Discussion

Based on the experimental results (100% successes), this is the most successful manipulation implementation tested.

Summary

The table below shows a summary of the results:

Technique	μ	\bar{X}
Commitment	$0.229 < \mu < 0.882$	0.556
Return Favor	$0.420 < \mu < 0.980$	0.7
Time Pressure	$0.356 < \mu < 1.072$	0.714
Environmental Cueing	$-0.072 < \mu < 0.644$	0.286
Group Influences	$0.100 < \mu < 0.700$	0.4
Authority	$0.682 < \mu < 1.095$	0.889
Affective Musical Themes	$0.179 < \mu < 0.963$	0.571
Partner Requests	N.A.	1.0

Table 1. Summary of the results of the experiment. μ is the success rate of the population based on a confidence interval of 90%, and \bar{X} is the estimated success rate based on the sampling of the population.

CONCLUSION

In this paper, we proposed several player manipulation techniques that can help game developers to solve the problem of manipulating the player to behave in a specific way. Although many techniques of the experimental study show poor results, there were a couple of techniques that showed potential in the tested implementation. The small sample size, limited control experiments, and little experience in this new area of research have surely contributed to many of the poor results in the study so far. We would also like to highlight that this is just the start of a new field of research, and hope that this paper has generated interest in this exciting new area.

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BIOGRAPHIES



Zi Xu, Siew



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Zi Xu, Siew is a student of National University of Singapore, majoring in Computer Engineering. The techniques proposed in this paper were developed as part of the final year project on the topic of Player Manipulation initiated by the NUS Games Lab.

Alexander Nareyek is the director of the interactive intelligence Labs (ii Labs) and of the multi-disciplinary Games Lab at the National University of Singapore, where he also holds an assistant professorship. He received his diploma and Ph.D. from the TU Berlin/Germany, held positions at GMD-FIRST/Germany, Carnegie Mellon University/USA, and the Cork Constraint Computation Centre/Ireland, and served as CEO and CTO for Digital Drama Studios/Czech Republic. He is the founder and owner of the games company Kingdom Crafting Pte Ltd, and also serves as chairman of the International Game Developers Association's Artificial Intelligence Special Interest Group.