

## Research Article

# Emotion-driven Behavior of Game Characters

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**ORCID**Mitra Istiar Wardhana: <https://orcid.org/0000-0002-7637-3159>**Abstract.**

The field of interpersonal communication recognizes the significant impact of emotions on interactions between individuals. The classification of emotions has been a longstanding topic of study and has become an important aspect of the communication process. Despite its significance, the utilization of emotions for the purpose of regulating character conduct has yet to be extensively incorporated within the domain of gaming. The many types of emotions that have been identified has led to the inadequacy of incorporating emotions in game characters. The rapid development of games requires game characters to have behaviors that resemble human traits. One way that can be done is to add emotion as a trigger for changes in the behavior of game characters. Setting the behavior of game characters is done by changing the value of the attributes they have. To apply emotions to game character attributes, rules are made that serve as a reference for how each type of emotion can affect game character attributes. This alteration in attribute will change the behavior of the game character.

**Keywords:** basic emotion, game character behavior, game character attribute

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## 1. Introduction

The affective domain of human intelligence is a crucial facet, where emotions play a significant role in the process of decision making. Individuals who possess the ability to comprehend emotions are typically those who have experienced them firsthand. However, individuals who lack direct emotional experience are able to deduce the emotions that a particular individual is experiencing based upon their exhibited expressions and behaviors. The impact of emotions on social interaction among individuals is, noteworthy as emotions, enable people to effectively communicate non-verbally. The phenomenon of emotions potentially enhancing human memory warrants investigation in academic discourse. It is commonly observed that emotional events tend to have a greater lasting impact on individual memory than events that lack an emotional component. The persistence of emotional impact across time can be observed in various

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instances. Specifically, the fear instilled by past events can have a lasting effect, while positive experiences tend to be etched into one's memory indefinitely.

Some experts have characterized several fundamental human emotions. According to [1] there are seven basic human emotions, those are happiness, sadness, fear, anger, disgust, contempt and surprise. Meanwhile, according to [2] there are eight basic emotions, called enjoyment, sadness, fear, anger, disgust, interest, love and relief. [3] also defines a number of seven basic emotions, such as happiness, sadness, fear, anger, disgust, contempt and interest. From the opinions of three emotion experts, it can be seen that there are five basic emotions that mentioned by each expert. Those emotions are happiness/enjoyment, sadness, fear, anger, and disgust. Those five basic emotions will be employed in the following discussion.

The co-existence of emotions and games is irrefutable. During gameplay, individuals are capable of experiencing diverse emotions, inclusive of positive affect, such as joy and satisfaction, following the successful completion of the game, and negative affect, such as sadness and disappointment, in the event of a loss. The experience of anger appears to struggle against formidable adversaries that bear resistance to defeat. The affective state of fear may become heightened when a player of a video game finds themselves in a dangerous situation or is engaged in gameplay that is associated with the horror genre. The sentiment of disgust may manifest itself in response to the identification of a cheating adversary or fellow player.

While players may experience a range of emotions when engaging with video games, the characterization of emotions within game characters remains a relatively uncommon practice. The emotional states of the players will be mirrored in the actions and responses of their respective in-game characters, as the latter serve to symbolize or stand-in for the former during gameplay. The incorporation of emotions in game characters has the potential to enhance the overall gameplay experience as it can fill the characters with a greater sense of humanity. As emotional elements employed, the character's behavior can change according to the emotion s/he is experiencing. Thus, in this article, a model for the application of emotions will be generated to regulate the behavior of the characters in the game.

## 2. Method

This study uses a qualitative approach by applying library research methods. In academic discourse, literature-based research is a methodological approach that entails employing literature as the primary focus for investigation and analysis. This very research comprises a set of tasks related to library data collection methods, reading, recording, and processing library collection materials alone without the need for field research [4]. Library research can also be interpreted as a series of activities related to library data collection methods [5]. The data used in this study employs secondary data sources, including journal articles that discuss about emotions and game characters, books, and other written documents. Hence, this research endeavors to investigate the influence of basic emotions on human behavior. It will examine the correlation between human behavior and emotions, as expressed through the behavioral patterns of the characters in the game.

## 3. Result and Discussion

Game characters which capable in responding to emotions triggered by player input are required to display behavior that corresponds with the emotional stimuli received. The emotions that will be used to trigger the character's behavior are commonly known as five basic emotions, which encompass joy, sadness, anger, fear and disgust. Before modeling the influence of basic emotions on game characters, the influence of each basic emotion on human behavior will be identified. According to [6]–[8] the influence of each emotion on human behavior is as follows:

1. Emotions of joy have an influence on increasing motivation, increasing the courage to take opportunities, being confident, creative and adding a sense of social like helping others.
2. Sad emotions have an effect on decreased motivation, withdraw from the social environment, often think negatively, interfere with routine activities such as eating and sleeping and have the potential to increase
3. Angry emotions have an influence on increasing aggressive behavior such as shouting, hitting and threatening. In addition, angry emotions can also trigger impulsiveness and reduce empathy. On the other hand, angry emotions can also increase adrenaline and energy to take action.

4. The emotion of fear has an influence on the emergence of feelings of panic, stress and negative thoughts. In addition, the emotion of fear also causes physical symptoms such as cold sweats, palpitations and difficulty breathing
5. The emotion of disgust has an influence on the appearance of avoidance behavior of disliked objects, cautious behavior and bodily symptoms such as dizziness and nausea. Frustration, fear and anger can arise in an effort to avoid feeling disgusted at something.

The results of identifying the influence of emotions on humans will be the basis for modeling emotions on game characters. In a game, character behavior is influenced by the physical attributes possessed by each character. An attribute in a game character refers to a measurable characteristic that describes their abilities, skills, and traits. This can include various elements such as strength, agility, intelligence, hit points, mana points, and others. Attributes often serve as the underlying foundation for a character's abilities, and they can be used to determine the effectiveness of different actions in-game. According to [9]–[15] some of the attributes used in role playing games include:

1. Strength: This attribute measures a character's physical power and determines their ability to carry heavy objects or deal damage in combat.
2. Agility: This attribute measures character's speed, dexterity, and coordination, and it affects their ability to perform physical actions such as moving quickly, jumping, dodging, and performing acrobatic maneuvers.
3. Intelligence: This attribute measures a character's mental acuity and problem-solving skills, and it can affect a character's ability to cast spells or use technology in-game.
4. Hit Points (HP): This attribute measures a character's health, and it determines how much damage they can take before they are defeated.
5. Mana Points (MP): This attribute measures a character's magical energy, and it determines the number of spells they can cast before they need to rest.
6. Endurance: This attribute measures a character's physical stamina, and it affects their ability to withstand physical stress and resist exhaustion.

In conventional games, the attributes of the characters will change according to the level of the game, but in this study, the abovementioned values will change dynamically

according to the type of emotion the character receives. To determine the response of the character, the rules governing the causal relationship between the types of emotions and character attributes are used. The rules are made based on the results of the identification of the influence of emotions on human behavior. From the identification results, the following rules are made.

The strength attribute will increase when the character is in a happy and angry emotional state. This rule is based on identification results showing that happy and angry emotions can increase courage and adrenaline in humans. The agility attribute will increase when the character is in a state of fear and disgust. According to the results of emotional identification, in negative emotional conditions, humans tend to avoid situations that make them afraid or disgusted. This condition can be applied to the agility attribute because this attribute regulates how the character’s agility avoids enemy attacks. The intelligent attribute relates to the character’s ability to release special abilities. Although normally this attribute is influenced by positive emotions, in some conditions negative emotions can also trigger characters to be able to reveal their special abilities. For example, when a character is angry or afraid, that character can release the special abilities they have.

Hit points and Mana points attributes—or commonly abbreviated as HP and MP—will increase along with the level the player has. This attribute can also be leveled up if the player uses special items which may increase the HP or MP. When associated with emotions, this attribute can be influenced by several types of emotions according to character traits. If the character trait is grumpy then HP and MP can increase once induced by angry emotions. For other characters, sad emotions can also be a trigger for increasing HP and MP for the ones who have sad traits. The last attribute, that is endurance, will increase if the character experiences angry emotions because they can cause impulsivity and increase adrenaline. The relationship between the types of emotions and NPC attributes is shown in table 1 below:

TABLE 1: Emotion and attribute relationship.

Emotion/Attribute	Strength	Agility	Intelligence	Hit Points	Mana Points	Endurance
Happiness	+	-	+	+	+	-
Sadness	-	-	-	+/-	+/-	-
Anger	+	-	+	+/-	+/-	+
Fear	-	+	+	-	-	-
Disgust	-	+	-	-	-	-

Determining the relationship between emotions and alteration in character attributes can shift depending on the type of character and the needs in the game. The autonomy of game designers allows them to create characters according to the needs of the story. As explained by [16] that character types can be divided into three, known as primary, secondary and tertiary. What is more, the application of emotion into game characters does not have to be applied solely to primary one. Secondary and tertiary characters also have the opportunity to be given emotional features so that they can add the forms of interaction between game characters. Typically, the interaction between characters is merely done with simple dialogue that has been scripted. Nevertheless, by applying emotional elements, the interactions between characters can be more complex since the characters will be able to respond according to the emotional conditions they are experiencing.

## 4. Conclusion

Applying emotions to adapt game characters is done by first identifying the influence of emotions on humans. The influence of emotions on humans is the basis for creating models of character behavior that are impacted by emotions. Changes in character behavior will be regulated through the attributes possessed by game characters. The alteration of the behavior exhibited by a character is accomplished through the modification of the attribute's value. Through the appropriate application of rules, there exists the potential for elicitation of alterations in the conduct of characters in response to the corresponding emotional stimuli. The implementation of emotional stimuli is possible across primary, secondary, and tertiary character classifications.

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