Making NPCs Human-like by using ChatGPT-4

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Abstract

In the games, NPCs are used for immersing players in the game world. We aim to make NPCs have a human-like conversation by using AI. For our goal, we used ChatGPT-4 and the existing prompt. The prompt does not have the information about the characters. In this study, we added the guidelines for creating the character to it. As a result, the characters created from the prompt including the guidelines were good for playing the game, but the conversation created from this does not enable us to distinguish who talks. The less restriction the characters have, the more understandable their conversation is.

1 Introduction

In this study, we aim to make Non-Player Characters (NPCs) in Role-Playing Games (RPGs) have more human-like conversations by using AI. NPCs are one of the parts to immerse players in the game world. In the game world, NPCs tell the players their world. Also, NPCs cause events. For example, they summon the hero and ask the person to save the world. In addition, in the village, they sell some items, ask the player to do some tasks, and give specific items. Then, using AI, NPCs may become more human-like. It leads players to immerse themselves.

In recent years, the evolution of LLMs has shown the possibility that they can generate human-like conversation. However, research on using LLM against NPCs in the game is still in its infancy. Therefore, we search for whether LLMs can be used for NPCs in the games, and how to incorporate LLMs with NPCs to make NPCs have more human-like conversations. In this paper, we try to create NPCs empowered by LLMs to find out the possibility of its realization.

Qichen Gao and Ali Emami investigated the application of Transformer-based models like GPT-3 to the task of creating NPCs and generating believable scripts. Then, they developed a novel pipeline capable of automatically generating NPC scripts comparable or of superior quality to human-written NPC dialogue using transformer-based PLMs. With this result, their system can decrease the consumed time and resources of the game developer to create narratives [1].

However, we should make the time and effort of creating NPCs smaller. For generating believable scripts, preparing the schema that characterizes a given NPC is necessary. This takes much time if the game has large variations of NPCs. This is a problem. In recent years, the field where the player can explore has increased. Along with this, more NPCs are required. On the other hand, the schema is limited. Therefore, the possibility of appearing the much similar NPCs will increase. It will increase the possibility of increasing the tasks of the game creators.

Then, we considered that entrusting creating NPCs to LLMs would solve this problem. Creating NPCs takes a lot of time because NPCs have some necessary elements. NPCs play their roles in the game world. Also, NPCs show the game world to the players from their viewpoint. In addition, the NPC is different from other NPCs. These are tough tasks for the game creators. However, if human-like NPCs who are fitted into the game world are created by LLMs without preparing the schema, the time and effort will be shorter. It can decrease the consumed time for creating NPCs of game developers even more. The game developers have a lot of various tasks to create a game. Hence, using leftover time, the game creators can do other tasks to complete creating the game.

2 Background

We focused on Non-Player Characters (NPCs). This means all characters in the game world that are not directly controlled by a player [2]. Then, we used Detective Text Quest GPT [3] as the origination of this study. This prompt does not have details about NPCs. Therefore, we added and modified their original prompt.

2.1 Non-Player Character (NPC)

The Non-Player Character (NPC) means all characters in the game world that are not directly controlled by a player. They are controlled by a game master in a Tabletop Role-Playing Game (TRPG), an actor in a Live Action Role-Playing Game (LARP), or computer software in a Computer Role-Playing Game (CRPG), and a Massively Multiplayer Online Role-Playing Game (MMORPG) [2]. In many games, there are NPCs. For example, if there is a shop, the clerk is an NPC. In addition, enemy characters such as monsters, thieves, and so on are also NPCs. However, a player character is not an NPC. The player character means that a character in a game is directly controlled by a player [2]. For example, a player decides to attack a monster with a sword. Then, the player character does what the player decides in the game world.

Table 1: Character's features

Feature	Examples
Appearance	The eye color is blue.
Personality	The person forces others to speak politely.
Principle of the actions	Tom thinks money is the most important thing. Thus, he does the most profitable thing.
Backstory	John grew up in a small town with a close-knit family and studied law, but he always had a passion for painting.
Motivation and Goals	Emma is motivated by her desire to uncover the truth, driven by the mystery of her sister's disappearance.
Emotional	Despite her tough exterior, Maria is deeply affected by cases involving children due to her childhood trauma
Relationship	Alex has a complicated friendship with his colleague, Sam, filled with competition but also deep respect.
Dialogue style	Detective Brown is in the working class and speaks in a calm, measured tone, often pausing to choose his words carefully, uses vernacular language and dialect of Lisson Grove, the words used by the working class, and double negative in the wrong way a lot, and drops some h sound of the words.
Inner Conflicts	Despite being a successful lawyer, Sarah struggles with self-doubt and the fear of failure
Growth and Change	Initially skeptical and detached, Tom gradually becomes more empathetic and involved in his cases due to being admonished by the player.

2.2 Detective Text Quest GPT

This is a detective text quest. ChatGPT comes up with a detective story, tells the plot, and announces game locations and characters. Then everything is in our hands: we move through locations, look for evidence, and interview characters, trying to find out who had the motive for committing the crime. The goal is to figure out who the criminal is [3]. The prompt of this game is the origination of this study to make NPCs more human-like. This prompt does not include information about NPCs. Therefore, we added and modified their original prompts.

3 Method

In this study, we used ChatGPT-4. Firstly, we tried to use ChatGPT-3.5. However, it is not suitable for the game. There are some problems. For instance, hidden locations are already discovered. In addition, there are some contradictions. This is a fatal mistake in detective games. Furthermore, ChatGPT-3.5 sometimes does not give the game. This is also a fatal mistake in the game. Hence, we decided to use ChatGPT-4 in this study. Next, we added the guidelines for creating the character and modified the prompt of Detective Text Quest GPT. After that, we evaluated by ourselves whether the characters played their roles in the game. In addition, we ask 10 students to take a questionnaire.

3.1 Prompt Creation

Prompt Creation is based on the prompt of Detective Text Quest GPT. This prompt has no details about NPCs. In this study, we added the guidelines for creating the character to this prompt. Following the guidelines, ChatGPT determines the character's features shown in Table 1 and saves the information in association with the name decided by ChatGPT. For increasing accuracy, the guidelines have examples of the features.

3.2 Evaluation

It is difficult to judge whether the character is human-like because to define exactly "human-like" is not possible. Then, we think that the possibility of distinguishing who talks is important for judging. In the novel, people can understand who is talking now. Therefore, in this study, distinguishing who talks is considered an element of human-like and is focused on. For the evaluation, we compared three games based on different prompts. One of the prompts is original. Another prompt is the original prompt added the dialogue styles of the characters. The other prompt is the original prompt added the details of the characters including the dialogue style. Also, there are two steps to evaluate.

First, NPCs are a part of the game. Thus, they must be useful in the game world. It means they play their roles in the game world. In this detective game, their task is that some of them lie, and others tell the truth. To confirm this, doing the game created by ChatGPT,

we evaluated by ourselves whether the characters played their roles.

Second, we asked 10 students to take a questionnaire. Evaluating how distinguishable the conversation is depends on who read that. Thus, some people are necessary to avoid being biased towards one's own opinion. There are three questions in the questionnaire. Each question is based on different prompts. Firstly, they read the content of the incident, the monologues of the characters, and the conversation of the characters without using the characters' names. Secondly, they evaluate how they distinguish who talks in the conversation from one to five. Five means that they can distinguish who is speaking. One means that they cannot understand who the speaker is.

4   Results and Discussion

When playing the game, the characters played their roles. Some of them lied, and others told the truth about the incident. In addition, the more NPCs' details took shape, the more solid the content of the game is. The NPCs of the game created from the prompts without the guidelines for creating the character did not talk much. ChatGPT usually tells us the summary of the character's saying. In the game based on the prompts with the characters' dialogue styles, NPCs tell us the information about the game, but the relationship between them is ambiguous. Therefore, the game created from the prompts with the guidelines for creating the character is the best game of these games.

However, in the questionnaire, the result is different. Table 2 shows how distinguishable in the conversation. If the average is getting closer to 1, the conversation is indistinguishable. If the average is getting closer to 5, the conversation is distinguishable. Table 2 shows that the conversation without the guidelines for creating the character is the most distinguishable. The conversation with the guidelines for creating the character is the most indistinguishable. On the other hand, the averages are not much different. It means that distinguishing is a difficult method for evaluation.

Table 2: Average of how distinguishable

Game	Average
With the guidelines for creating the character	2.4
With the characters' dialogue styles	3.8
Without the guidelines for creating the character	3.9

Furthermore, we got some feedback from students. They told us about the difficulty of distinguishing who is talking. It is easy to find out whether the speaker is male, or female. If their monologues and their conversation are simple, it is easy to understand who talks now. However, determining who talks from their monologues is difficult because understanding characters' features takes time. Just monologues are not enough to understand the characters. Also, it is difficult to discern who talks in the conversation without using the characters' names.

Thus, we consider that the differences between the first result and the second result come from different preconditions. When playing the game, we can know who talks now. Then, we focused on the character's details. However, if we cannot know who is a speaker, we focus on the character's dialogue style. The more solid the character's details are, the more restrictions the character is subjected to in the conversation. If the character has a lot of restrictions, its monologue and conversation become more complex.

From the above, this result tells us that the way to evaluate whether NPCs who play their roles in the game world are human-like by the possibility of distinguishing who talks is difficult. If the conversation is distinguishable, it is good. On the other hand, if the distinguishable conversation is simple, the variation of the game is not much. That system is not useful for creating NPCs in the game. Therefore, if we evaluate whether NPCs are human-like, then we should choose another way. This evaluation method is not suitable for determining how human-like NPCs are.

5   Conclusion

In this paper, we aimed to make NPCs have a conversation that is distinguishable about who is the speaker without using their names. However, the way to evaluate it is difficult. The NPCs who played their roles well do not mean they have a distinguishable conversation. The fewer restrictions they have, the more understandable their conversation is. On the other hand, the more restrictions they have, the better they play their role in the game. Therefore, evaluating whether NPCs who play their roles well in the game are human-like by the possibility of distinguishing who talks is a difficult way. This evaluation method is not suitable for determining how human-like NPCs are. Nevertheless, we were able to accomplish to make more useful NPCs in the game world. NPCs having many features played their roles well and told the player the details of the game world more. Thus, in the future, considering this time, we will prepare another way to evaluate whether the NPCs are human-like.

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References

[1] Qichen Gao and Ali Emami, "The Turing Quest: Can Transformers Make Good NPCs", 2023.

[2] J. P. Zagal and S. Deterding, "Definitions of 'Role-Playing Games'" in Role-Playing Game Studies: Transmedia Foundations, Routledge, 2018.

[3] Valery Popov, "Как я сделал игру на ChatGPT" ["How I made a game with ChatGPT"], Habrahabr, 2023 [Online]: https://habr.com/ru/articles/776806/