Automatic identification of secondary narratives in videogames*

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Abstract

Computational narrative is a complex field. While the computational processing of narratives has been tackled from different perspectives, the literature has focused on the analysis of a main plot, even if it is composed of different narrative sub-plots. However, modern narrative often involves additional threads that complement, justify or enhance the main narrative. This is commonly observed in narrative in video games. In this paper, we present a computational engine that can automatically differentiate between primary and secondary stories. This differentiation is based on the identification of a number of features that are believed to be key factors in the classification. We have analyzed a number of stories by using a simple game prototype with several stories, and a prototype assessment of the effectiveness of the system with human players has been carried out. Results indicate the hypothesized features can certainly be used to identify or produce secondary stories linked to a main plot.

Keywords

computational narrative, secondary plot, videogames, narrative features

1. Introduction

There exist many efforts towards achieving rich narrative generation, particularly in videogames[1, 2, 3, 4, 5]. In an interactive system like video games, factors such as the designer and the player are added. The narrator (designer) communicates a series of narrative events to the reader (player), and their interaction alters the state of the events, creating or advancing the events. An artificial intelligence can intervene or assist in the process, either by controlling the world and characters to create new situations (simulation-based model), or guiding the player by generating partial stories to maintain the designer's original idea. Telling stories is always and complicated, but doing so in videogames has an added difficulty and that is that the player, the audience of said story, has the option to interact with the videogame and thus affect

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the narrative in some way [6]. This offers many possibilities, since the experiences that some players have will be unique from those of others simply because they will have made different decisions. However, managing all the stories that make up a video game is complicated. This is due to all of the different ways to present a story within it, related with all of the different genres that exist. In Half Life, the story is presented as if the player was the main character and is the one provoking all of what is happening within it, but it doesn't give that much of a choice on how the story will develop. However, games like Fallout: New Vegas and Persona 5 which are Role Playing Games, give the player the opportunity to choose how they want to experiment the story. All the stories in these games are still all planned by the developers. From a narrative perspective, there are different levels of importance attributed to different storylines. The most important is the main narrative, which is considered the most significant by both the author and the audience. This narrative typically serves as the catalyst for the plot and everything that follows. On the other hand, there are some side stories that accompany the main plot and occur normally at the same time, which are considered as secondary narratives. In this work we look for a way to develop a system capable of classifying the different stories of a video game into main and secondary ones and that can then provide these stories to the player.

2. Features used to differentiate between narratives

In order to differentiate the narratives that make up a video game into main and secondary ones,this research proposes to represent stories and narratives in a classic way, observing the writing style of certain novel authors who structure their stories through chapters that are in turn composed of different scenes using the following structure: Story - Chapters - Scenes [7]. The presence of characters and the places visited through out the story, due to the tendency to open worlds within video games, is also considered. Therefore, the following starting hypothesis was established: the main narratives are those that are the longest in terms of the number of chapters, those that visit a greater number of places and those that contain a greater number of characters, compared to the rest of the stories that make up said video game. More formally, we compute the next formula for each subnarrative in order to identify the most prominent ones (CW is the *relative weight of chapter length*= 33.3%, CL represents the *number of chapters*, NCW is the *weight of the number of characters*= 33.3%, NC represents the *number of characters*, PW is the *weight of places visited*= 33.3%, and PV represents the *places visited*). The weight values correspond to the values assigned in the experiment: $\frac{(CW*CL)+(NCW*NC)+(PW*PV)}{3}$.

3. Prototype, experiment and results

In order to test the hypothesis, an simple videogame in which to develop the plot has been developed. This environment includes a main story together with the necessary requirements, and several secondary stories. The content of the stories was given the same amount of semantic relevance in the story. Only the values of chapters, characters and places were different. The story was implemented in a simple prototype, using a 2D style with RPG modality to develop each of the plots in a setting set in medieval fantasy. Only two small cities, a forest and a

dungeon that connects them and a maze were present in the prototype. In addition, the game implements some systems necessary to progress, such as the player's interaction with the game elements and control system, as well as managing the progress of the stories by starting different dialogues, advancing between the different chapters of the plots. The main story is loaded and executed from the beginning, while the secondary ones are executed by interacting with specific elements of the setting, such as some NPCs or some object. In order for the results of the experiment to be as objective as possible, the game was organized in a way that the players would not know which was the main story and which ones were the secondaries. Therefore, all stories started at the same town talking to different NPCs and triggering their respective storyline. A total of 10 people (3 women and 7 men, from 19 to 63 years old) participated in the experiment. The participants were given access to a questionnaire gathering the time spent in the game; perception of the game as a whole, such as the number of stories he/she has been able to identify and which of all those he/she considers as main; and analysis of each of the game to know how involved the variables of the hypothesis are in identifying stories. For the first story, which was designed to be the main narrative for this prototype, 9 out of 10 players found it and completed it and 8 of them considered it as the main narrative. Then they were asked for more information and why they considered this story as the main narrative of the game. The reasons why this was considered were because of the narrative importance, the characters involved in it and the objects that took part on it. It is also relevant to point out that 7 out of the 8 people who considered it the main narrative, was because this story is the first one to be played in the game. As for the length of the story it was considered to be of a medium duration. Most of the people found it to have a normal length. As for the number of characters involved it was also considered to be of a normal quantity. The second story was played by 9 out of the 10 total players. However, none of the players that found and played this story considered it to be the main narrative of the game. When asked if this story could be considered as the main narrative only 22.2% of the players considered it to be relevant enough to work as a main narrative plot. The people who considered it said that it was the most developed story, while the rest of the players said that it was too short to be the main plot. It was mentioned as well that this story's ending is not very open and is hard for it to be continued. For the duration of the story, as mentioned before, it was considered by most of the players to be too short. As for the characters quantity, it was considered to be enough and normal. In he third story only 70% of players interacted with it, making this story to be not very well situated for the players to locate it. Also, it was not considered to be the main narrative by all of the testers who found it, making it's design as a secondary narrative correct. However, contrary to the second one, 100% of the players said that it couldn't be the main plot of the game. One of the arguments given for this was that there was too many characters and with little narrative relevance, which gives the result that it does not matter the quantity of the characters, but the narrative importance of those characters. This will be important because it will affect the final equation. The fourth story, it was played by the 80% of the players, which made it the second most played secondary story. As for the classification of the story, seven out of the eight players considered it as a secondary narrative. However, three out of eight said that it could be considered as the main narrative. This was because of the open ending and the possibility to continue it. As for the length of the story and the quantity of characters it was considered to be of a medium-short length with a small quantity of characters. This reinforced the idea that the

quantity of characters was not that relevant against the narrative relevance. Table 1 shows the results.

Story	Chapter	Characters	Places	Classification	User classification	Hypothetical classification
1	33	26.6	50	34.13085178	44.4	44.4
2	33	9.39	42.85	18.73401452	0	11.1
3	22.2	37.3	28.5	28.05248018	0	0
4	11.1	22.8	28.5	17.74754558	6.3	18.8

Table 1
Result values of the experiment, including user and computed secondary story estimations.

4. Conclusions and future work

An automatic story categorization model, capable of differentiating between main and secondary stories has been developed, and a simple experiment has been run. The results are partially positive and the model is scalable, but the experiments are limited by the number of participants and the impact of the hand-written narratives. Other aspects could also help to refine the approach. For instance as the importance of objects, which according to the surveys carried out with the players in both phases of the experiment could be just as important as the variable centered on the importance of characters. It was observed that stories with open endings have also captured the attention of respondents, who considered that the stories could continue and be much larger than what was seen in the prototype. Finally, the location of the character that starts the story is also very relevant, since if the NPC in charge of said task is near the player once the game starts, the player has to relate it to the main story.

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