

Simonstown: An AI-facilitated Interactive Story of Love, Life, and Pandemic

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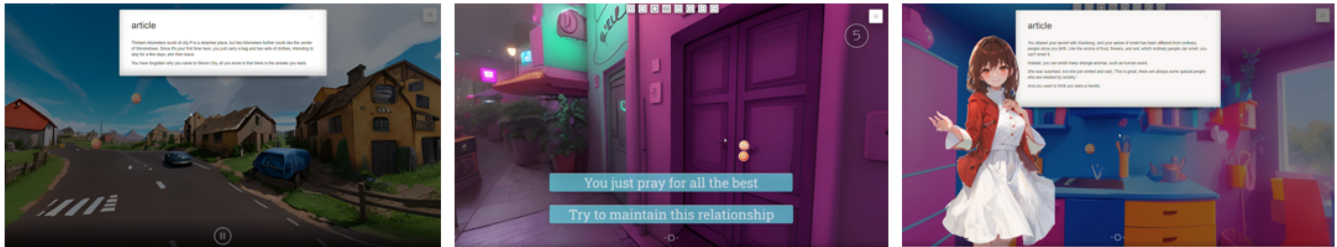


Figure 1: Some example interfaces of our interactive film. Audiences can explore multiple scenes (left), make individual choices that will affect the plot (middle), and interact with virtual characters (right).

ABSTRACT

We present an interactive story named *Simonstown* that demonstrates the love and life of ordinary people in the fictional setting of a fatal pandemic. Technically, the artwork integrates different Artificial Intelligence (AI) technologies in the whole production pipeline, including concept formation, creation, and presentation stages; artistically, this interactive film explores the relationship between human and environment in the contemporary context, especially infused with advanced technologies in daily life. The project serves as a demonstration and case study of AI-facilitated interactive storytelling, including better control with AI and how they integrate with live image projects, as well as using the stand-alone camera for real-time synchronization. Our results highlight the significant contribution of AI in visualizing intricate story branching, translation, and adaptation, presenting AI visualization as a distinct, specialized, and well-suited tool for interactive filmmaking.

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1 INTRODUCTION

The art of storytelling has always been a powerful medium for expressing the complexities of the human experience. With advancements in technology, the field of interactive storytelling has emerged, offering new opportunities to engage and immerse audiences in narrative experiences. In this paper, we present an interactive story titled *Simonstown* that explores the love and life of ordinary people in the fictional setting of a fatal pandemic. The project aims to demonstrate the integration of different AI technologies in the entire production pipeline, from concept formation to creation and presentation stages.

Drawing inspiration from the real-world experiences of diseases such as Acquired Immune Deficiency Syndrome (AIDS) and the recent Corona Virus Disease (COVID-19) pandemic, *Simonstown*

dives into the profound impact of fatal infectious diseases on individuals and society. By examining the themes of love, resilience, and the relationship between humans and their environment, the story invites audiences to reflect on their own experiences and moral choices. Our artistic approach combines elements of contemporary technologies, focusing on the often-overlooked perspectives of Third-World countries and disadvantaged groups.

To bring the story to life, we employ AI tools and generative models throughout the creative process. Hypertext serves as the foundation of this interactive story, utilizing symbolism, rich imagination, and multiple story paths to engage the audience. Choices have been intricately designed to facilitate the transition from passive viewing to active decision-making [22]. Visualization of the scenes and characters are created with the assistance of AI techniques, such as panorama generation and character illustration. The result is an immersive and interactive film that allows for personalized exploration and engagement.

In this paper, we outline the background and motivation behind *Simonstown*, discussing the artistic prototype and philosophical stance that underpin the project. We then describe the story design and generative pipeline, highlighting the integration of AI technologies in each stage of the production process. Furthermore, we delve into the text-based story, scene generation, and character design, elucidating the creative choices and AI tools employed. Finally, we present a comprehensive analysis of the project's impact and significance, shedding light on the potential of AI-facilitated interactive storytelling.

2 BACKGROUND AND MOTIVATION

2.1 Story Background and Artistic Prototype

Diseases are one of the most common adversities that humans encounter. Even in the modern era with advanced technology, the topic is still closely related to our lives. Just a few years ago, the globe underwent COVID-19, a pandemic that greatly influenced and shaped our ways of living. If we focus on a longer timeline, many more chronic diseases are affecting our perceptions and values more profoundly, especially those fatal or infectious. First discovered in the 1980s, AIDS is one of them that received the most attention for its near incurability.

By comparing these two kinds of diseases in their features, effects already made, and historical implications, we may notice that they in some way constitute the twists and turns in the civilizational process of humankind. COVID-19 majorly reflects short-term panic about the original unfamiliarity and unpredictability of its effects; AIDS, on the other hand, symbolizes the anxiety and helplessness brought and acquired by the fatal consequence. Similar descriptions can be found in different documentary or fictional works, such as *La Peste* by Albert Camus [10], *Diary of a girl with HIV* by Julia [15], and *And The Band Played On* by Randy Shilts [19]. Moreover, it is a classical theme in literature to complement those striving to stand against fatal disease, whose lives composed an anthem for resilience and vitality.

Different people have different choices and responses when facing such difficult scenarios, but there are also some macro and common trends. For example, during the COVID-19 period, the break-up and divorce rates increased greatly, and people tend to be

more cautious about building up a relationship. Similar patterns are found in both individual and collective encounters, either historically or artistically. For example, *Gone with the Wind* by Margaret Mitchell [18] describes a love story in Atlanta, Southern America, during the Civil War (1861-1865); *Love in a Fallen City* by Eileen Chang [11] is based on the Second World War (1931-1945) in Hong Kong and Shanghai, China; and *Love in the Time of Cholera* by Garcia Marquez [16] is set in Columbia, South America. In whichever context, love is connected with social affairs and crises such as war and disaster, and the artistic prototype of Love in a Chaotic Era often constitutes a mirror to humanity.

2.2 Philosophical Stance and Artistic Style

Just as all humanities disciplines inevitably encounter the problem of value choices, we also have to clarify our stance in designing and implementing the project. For one thing, similar themes have been discussed in different historical contexts with different settings and features. Even with unprecedented technological and medical advances, we are experiencing the powerlessness of modern social patterns and scientific rationality in the face of COVID-19. Also, the pandemic has brought complex geopolitical and national identity issues, which are exacerbated by globalized public opinion space. Finally, we prefer to focus on the generally overlooked part of it, especially the Third-World countries and disadvantaged groups, to conduct a deeper reflection on humanity.

Meanwhile, literary genre and writing style are important in storytelling and greatly affect the reception and interpretation of the artwork. We learn from the well-known Columbian writer Garcia Marquez for plot setting, social background depiction, as well as writing techniques. Specifically, we derive extensive use of symbolism and absurdity from his *One Hundred Years of Solitude* [17] and incorporate them into our interactive story. In this way, we hope to bridge audiences' real-life experiences with transcendental philosophical themes.

3 RELATED WORK

The integration of AI technologies in interactive storytelling has been a popular topic in both the research and production communities. Many projects have explored the use of AI in forming story ideas and creating immersive narrative experiences. We discuss some relevant works in the following sections.

3.1 AI-Facilitated Interactive Storytelling

The concept of AI-facilitated interactive storytelling has gained traction in recent years. One notable project in this domain is the movie *Sunspring* by Oscar Sharp and Benjamin [4], which combines AI screenwriting and fictional film techniques to create a dynamic narrative experience. The system utilizes natural language processing and machine learning algorithms to generate stage directions and dialogues based on user prompts, resulting in a collaborative storytelling experience.

Another noteworthy project is *Façade* by Michael Mateas and Andrew Stern, which explores AI-based interactive storytelling [1]. The video game uses AI planning algorithms and natural language processing to enable real-time character interaction and story progression. Users can engage with the characters through natural

language input, shaping the narrative through their actions and dialogue choices.

3.2 AI in Visual Scene Generation

AI techniques have also been applied to visual scene generation, enhancing the immersive nature of interactive stories. *Text2light* developed by Chen et al. leverages generative models to translate textual descriptions into visual scenes [12]. The approach bridges the gap between textual descriptions and visual representation, enabling the creation of rich and detailed environments.

Ullah et al. also present a method for generating realistic and detailed panoramas [20]. The system utilizes a cost-effective multi-camera system and stitching software to enhance the visual quality of generated scenes. Super-resolution and stylization using convolutional neural networks further contribute to the realistic and artistic appeal of the panoramas [21].

3.3 AI-Enabled Storytelling in the Context of Pandemics and Diseases

Exploring the themes of pandemics and diseases in storytelling is not new. However, the integration of AI technologies in this context is an emerging area. Projects like *Foldit* by Zoran Popovic and his team focus on creating educational experiences that simulate proteins and allow users to make combinations to test possible cures [13]. The system employs AI algorithms to model disease dynamics and simulate realistic scenarios, enhancing the educational value of the narrative.

Furthermore, video games such as *Plague Inc.* [2] and *The Walking Dead* [3] investigate the use of online games to raise awareness and promote behavioral change during disease outbreaks. The games leverage AI techniques to model the spread of diseases and provide players with insights into the effectiveness of different preventive measures.

These projects demonstrate the potential of AI-facilitated interactive storytelling in engaging audiences, providing personalized experiences, and promoting awareness and understanding of pandemic-related themes.

4 STORY DESIGN AND GENERATIVE PIPELINE

Based on the previous analysis, we summarize the story theme and writing presets of our artwork. Our story is expected to explore the love and life of ordinary people in socio-environmental crises, especially a fatal infectious disease. The style of writing should incorporate rich imagination and symbolism, as a homage to post-modernist writers from the Third World. We want to focus on the relationship between people and their environment and amplify the connection between personal experience and social destiny, in an attempt to stimulate empathy in our audience and help them reflect on making individual moral choices and their consequences. To make the story richer and more three-dimensional, we may highlight more presumable themes, such as the insignificance of man in the face of nature, as well as a lack of truth, consensus, and certainty transcending faith in the contemporary world.

Figure 2 displays our generation pipeline, including different creative stages and how AI can be integrated into each stage. Our

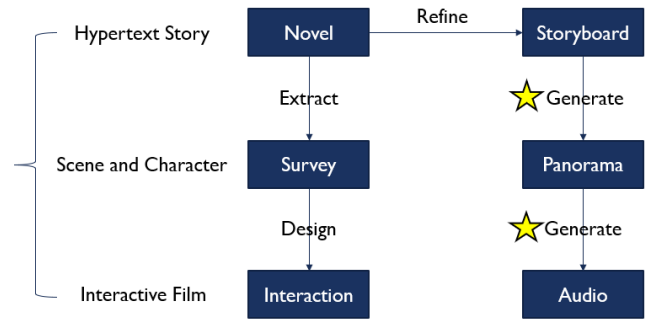


Figure 2: Generation pipeline. The stars indicate AI integration or assistance in the process.

project is mainly comprised of three parts: hypertext story writing, scene and character design, and interactive film production. Each part utilizes AI tools (especially generative models) to assist human creativity, and they combine into a film-based story with different plot branches, numerous characters, and elaborate scenes, supporting individualized immersive exploration.

5 HYPERTEXT STORY

We first wrote a hypertext story to concretize our design concept and creative goals. The story is originally presented in the form of a traditional novel. Then, the novel is processed and converted to a storyboard that mimics the setting of a movie. The two textual forms reflect characteristics of different media to achieve the transformation between them.

5.1 Novel Design

The social background of the story is shaped by the fusion of AIDS and COVID-19, resulting in a unique setting. In the once peaceful city of P, known for its radical left-wing ideals, life takes an unexpected turn when a rainstorm introduces a virus transmitted through sexual contact. The disease is characterized by distinct external manifestations, such as emitting an unpleasant odor and gradual decay of the flesh. These dramatic features of the virus bring the disease to life in a tangible way. As a consequence, the people of P face a prolonged period of blockade, isolation, and discrimination, leading them to establish a social organization called Simonstown. This historical context reflects the struggles and challenges faced by the community in their fight against the virus and its societal consequences.

The characters in the story carry symbolic and metaphorical significance, contributing to the depth and meaning of the narrative. The audience (you) of this interactive story embodies the role of the protagonist, a responsible researcher and an empathetic expert in the science of smell. Your expertise in this field becomes crucial in the unfolding events. Your ex-girlfriend represents the lover from your past, with whom a relationship did not materialize due to various circumstances. She serves as a poignant reminder of missed opportunities and unfulfilled desires. Another significant character is your high school classmate, who previously worked in

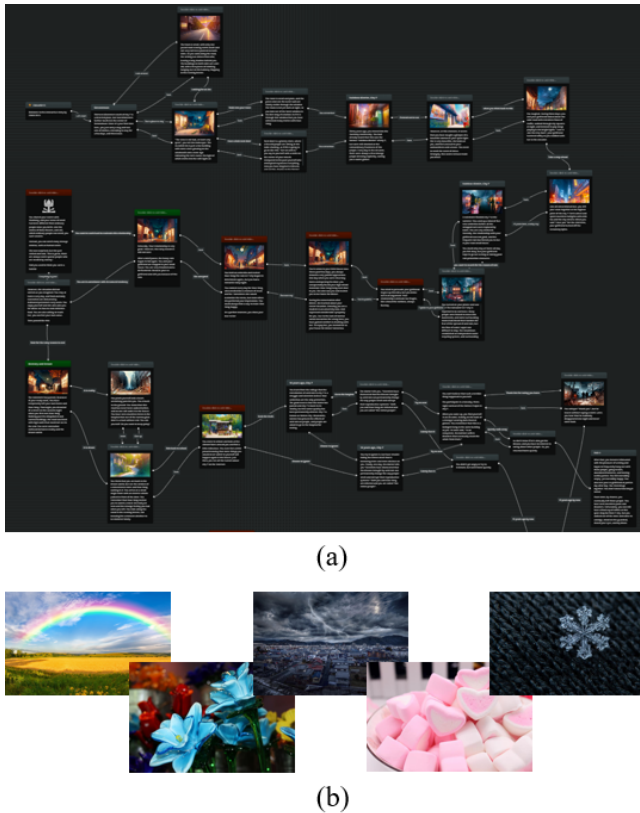


Figure 3: (a) Demonstration of part of our storyboard. (b) Some core imageries are used as story elements and symbols.

a spice factory. Throughout the story, she evolves into your soulmate, representing a union that goes beyond initial expectations and blossoms into something extraordinary. Lastly, your neighbor, a biologist, makes brief appearances in your life but leaves a lasting impact with prophetic predictions, adding an element of intrigue and foreshadowing to the narrative. These characters, with their symbolism and metaphorical qualities, contribute to the rich tapestry of the story, shaping its themes and driving its emotional core.

5.2 Storyboard Design

The storyboard design of the interactive story undergoes a transformation from a hypertext narrative to a choice-based visual experience, refining and structuring the storytelling process.

The story is built upon a well-defined structure. The outermost layer is the setting of a dream, which adds a sense of plausibility and intrigue to the overall narrative. The second layer revolves around the memories of the main character, delving into their past experiences and personal journey. The third layer is composed of memories contained within each token, further enriching the story's depth and offering opportunities for exploration and discovery.

Figure 3-a illustrates part of the storyboard with major plots and the connection and transition between them. Specifically, scenes

and plots within our story are structured with essential elements and core imageries (Figure 3-b) [9]. Among them, rainbow symbolizes youth and beautiful fantasies, adding a touch of wonder and optimism; glass rose represents delicate and fragile love, evoking emotions of vulnerability and tenderness; rainstorm signifies chaos and crisis, driving the tension and conflict within the narrative; marshmallow serves as a metaphor for memory and sweet dreams, offering moments of nostalgia and comfort; lastly, snow represents serenity and retrospect, providing opportunities for reflection and introspection.

Also based on these imageries, the story is divided into five parts, each containing distinct plot developments and contributing to the overall narrative arc. These segments lead to five different endings, adding variability and replay value to the interactive experience. To ensure a polished result, the story undergoes proofreading with users, allowing for feedback and perspectives from the audience's point of view. The aim is to enhance audience involvement and provide an immersive dramatic setting.

We intentionally enhanced the situational choices that lead to different plots. For example, the most difficult choice for the main character is whether to embrace a new life or cling to the old ways, represented by two girlfriends. The first girlfriend symbolizes passion and impulsiveness, while the second represents plain and ordinary love. This choice challenges the protagonist as it involves abandoning a sweet dream for reality and signifies the divergence between idealized romance and real love. The choice arises during a major historical event, where water contamination and a fatal disease isolate people and impact their relationships, triggering reflections and reevaluations. The consequences are not based on strict cause-and-effect, as we prioritize exploring ordinary lives and the growth that comes with necessary losses.

The theory of Cognitive Development (balance-crisis-rebalance) by Piaget [8] is applied throughout the story, creating a sense of equilibrium, disruption, and resolution. This ensures a satisfying and engaging narrative flow. Additionally, emphasis is placed on enhancing the contrast and interaction between the protagonist and antagonist, allowing their dynamics to shape the story's conflicts and resolutions.

Finally, we also conducted some proofreading and collected user feedback to improve the storyboard. Users expressed strong preferences for the immersive narration, appropriate choices, and aesthetic features. Based on their comments, we enhanced the brevity of background descriptions and added the function of return-key and re-selection to the plot. Overall, the text-based story design incorporates a thoughtful structure, memorable symbols, multiple story paths, and considerations for user feedback and dramatic impact. These elements combine to create an interactive story that captivates and engages the audience.

6 SCENE AND CHARACTER

After defining the story structure, social background, and plot, we focus on the major scenes and characters to translate and adapt hypertext to visuals. In this process, we not only implement the plot branching but also leverage AI techniques to generate High Dynamic Range Images (HDRI) for interactive visuals with virtual navigation.



Figure 4: Comparison of scene generation results. The implemented tools are (a) Text2light, (b) Stable Diffusion, and (c) Skybox AI. The final one also supports day-night or cross-style conversion.

6.1 AI-facilitated Scene Generation

To conduct AI-facilitated scene generation, various attempts at panorama generation are explored to enhance the immersive nature of the interactive story (Figure 4) in its visual form. One method employed is Text2light, a text-to-panorama generative tool that translates textual descriptions into visual scenes. This approach aims to bridge the gap between text-based storytelling and visual representation.

Another attempted method involves fine-tuning a Stable Diffusion [14] model, which allows for the generation of more realistic and detailed panoramas. The process incorporates text-to-image techniques and is optimized in image-to-panorama translation with regard to the current clipping limitations. Super-resolution and stylization using convolutional neural networks (CNNs) further enhance the visual quality and artistic appeal of the generated scenes.

To refine the methods, combination and composition approaches are explored, leveraging techniques such as ControlNet [23]. This enables finer control and customization over the generated panoramas, resulting in more tailored and cohesive scenes. Additionally, all-in-one tools like skybox AI [7] offer a comprehensive solution, consolidating various panorama generation functionalities into a single tool. This streamlines the scene generation process, improving efficiency and accessibility.

The implementation of scenes is achieved through AI-generated hypertext, utilizing the Blockade Labs [7] as the tool. The production approach revolves around creating a usable and interactive panoramic map, for which the Lapentor [6] is utilized. Each corresponding panorama in the story is enhanced with hotspots, allowing the display of story progress and enabling scene transitions. Although Unity engine and krkr engine are options for building panoramas and interactive games, the decision is made to use Lapentor directly.

The advantage of employing all-in-one tools lies in their ability to simplify and optimize the panorama generation workflow. These tools integrate multiple techniques and functionalities, providing a seamless and user-friendly experience. They offer a unified platform for scene creation, reducing the need for separate tools or complex



Figure 5: Examples of character illustrations. The features are designed to change according to time, plot, and emotion. (a) female character I, left: sad, right: happy (night); (b) female character II, left: unhappy, right: happy (winter).

workflows. By utilizing all-in-one tools, the process becomes more streamlined, allowing storytellers to focus on crafting engaging narratives and immersive experiences for the audience.

6.2 Character Design

Based on the previous storyboard, we design both the appearance and identity of each character and implement them in the film context. The character’s fundamental traits are determined according to the nine alignments of Dungeons & Dragons (DND) and the MBTI personality test, which serve as the reference for character design. The production process involves using Stable Diffusion to generate the base graph, implementing local modifications with ControlNet, employing Photoshop for painting, and applying post-processing techniques to capture different lighting and shadow effects for both day and night scenes. These techniques culminate in the creation of character illustrations.

To differentiate the two stages of emotions of the protagonist, a contrast between warm and cool color tones is utilized in the character design. This distinction helps convey the different emotional atmospheres. Furthermore, changes in the color tones of the characters’ clothing are employed to signify their respective emotional states. For instance, the ex-girlfriend initially wears a dress adorned with patterns and white lace accents. However, as the story progresses and her emotions and the ambiance turn gloomy, her dress gradually transitions to pure black.

By incorporating these design elements, the final illustrations (Figure 5) effectively capture the essence of the characters and their emotional journeys. The use of color tones and variations in clothing not only differentiates the two main female protagonists but also reflects their personality traits and symbolic meanings throughout the narrative. The combination of graphical techniques, thoughtful design choices, and post-processing effects adds visual richness and emotional depth to the interactive story.

It is worth mentioning that our scene and character design is also an integral part that seamlessly blends with the plot. For example, the most intensely emotional moment in our story occurs when the city faces continuous torrential rain disasters, leading to the protagonist’s deteriorating mental state and the collapsing relationship with his ex-girlfriend. This moment is the story’s lowest

point, where players must choose between indulging in despair or finding the strength to persevere. At this time, the visual style of both environment and ex-girlfriend shifts from bright tones to dark and cold hues, emphasizing the hero's plight and creating a beautiful yet melancholic atmosphere.

7 FILM-BASED INTERACTIVE STORY

In this section, our focus is on the seamless integration of diverse hypertext and visual forms into a coherent and meaningful interactive film. With AI participation in both production and post-production processes, we highlight the expressive and transmissive features of the film medium and implemented another transition from discrete elements to an immersive experience.

7.1 Production Details

In this part, we discuss the general process and specific methods and tools used in the interactive film production pipeline. In general, the final product is a combination of designing the flow and branching of the story (section 5) and revolving key points around the scene and character construction (section 6). Based on them, the inclusion of additional scenes beyond the main ones enhances the project, and numerous interactive hotspots are added. Video editing is employed to separate different story paths, enabling the audience to make choices and reach different endings.

Within a story segment, the characters follow the exploration step by step, using hotspots to observe the story and reach a decision point. Based on the events preceding this point, the characters make their choices, leading to different storylines. The story continues as the characters make new choices, ultimately leading to various endings. To design the branching story flow based on videos, Eko Studio [5] is used, allowing for the creation of the final project that aligns with the approach described in section 5.

By incorporating these production details, the interactive story gains a dynamic and engaging narrative structure. The utilization of AI-generated scenes, interactive hotspots, and video-based branching flow enhances the viewer's experience, offering the opportunity to explore different storylines and reach diverse conclusions.

7.2 Post Production

In the post-production step of the film-based interactive story, several elements are incorporated to enhance the overall audio-visual experience.

For one thing, different scenes are filtered and adjusted to create a cohesive visual aesthetic and appropriate transitions are applied to ensure smooth scene changes. Specifically, we emphasize the context and time changes between different scenes through visual cues, such as fading filters and prominent subtitles. By providing more specific clues for scene backgrounds and divisions, we can minimize the ambiguity and confusion caused to the audience.

Moreover, Some sections may be removed or combined to create a more harmonious flow. Character illustrations are added, accompanied by post-processing and animated entrances and exits to bring them to life on screen. To complement different emotions, suitable background music (BGM) is added. Special sound effects such as thunder, rain, and shattering frames are included to create a more immersive environment. The BGM undergoes editing and

rearrangement to align with the pacing of the storytelling in the video.

For the post-production process, the video editing software used is Adobe Premiere (Pr), which provides the necessary tools for refining and polishing the interactive story. Through these post-production techniques, the audio and visual elements of the interactive story are further enhanced, creating a more immersive and engaging experience for the audience. The combination of carefully chosen BGM, sound effects, scene filters, transitions, character illustrations, and animation contributes to the overall atmosphere and narrative flow of the story.

8 DISCUSSION

8.1 Contribution

The interactive film presented in this paper explores the potential future directions of AI technologies, particularly in terms of higher knowledge and higher-level controls. It achieves this while staying true to traditional film storytelling principles and techniques. The project serves as an extension and reflection of the advancements in AI and its collaboration with human creators in content creation and artistic design. AI functions primarily as a controllable generative tool throughout the process, enabling the creation of diverse and immersive experiences.

The implications of this interactive film project lie in understanding the engagement of AI in different stages of content generation and assessing its performance. The incorporation of user feedback becomes essential as it demonstrates how AI facilitates effective communication between creators and the audience. However, certain limitations still exist, such as the unpredictability of generated results and the lack of precise control. To overcome these challenges, future work may involve leveraging more state-of-the-art tools and incorporating a procedure of modification beyond AI generation.

8.2 Future Work

Moving forward, there are several areas that warrant further attention and refinement in this interactive story project.

In terms of plot refinement, the focus lies in refining the narrative arcs and uncovering details that may be overlooked. The aim is to create a captivating and meaningful experience for the audience, with specific elements and choices leading to different outcomes. Ideally, the story revolves around one optimal ending that represents the right choice for maintaining a meaningful relationship. This emphasizes the importance of thoughtful decisions and nurturing connections. Conversely, the possibility of a quick end highlights the consequences of apathy and selfishness. Further exploration of the plot's structure and the impact of choices can enhance the overall storytelling experience. On the other hand, we may also conduct more comparative validations on AI's improvements in the efficiency and quality of storyline creation over existing approaches using state-of-the-art digital tools, to provide a more solid benchmark for reference.

Scene refinement is another area for future work. Utilizing 3D graph remix tools, the visual elements of the story can be enhanced. The emphasis is on creating scenes with different styles that emphasize time change rather than space change. The inclusion of specific

decorations, attention to shadows and colors, and the representation of each character’s environment contributes to the immersive nature of the story. Further exploration of these tools and techniques can result in more visually engaging and meaningful scenes. It is also worth mentioning that for each design stage, there may be multiple tools applicable for similar tasks. We are looking forward to more comprehensive analyses of updated AI tools to demonstrate their potential in interactive story production.

Additionally, AI’s role in facilitating reflection on the ever-changing spiritual culture is worth exploring. Similar to traditional art forms like architecture and sculpture, literary art evolves and adapts to address the questions and concerns of the times. Beyond the pursuit of literary skill and expressiveness, AI can serve as a valuable resource for exploring new expressions of our age by utilizing historical knowledge within pre-trained models.

Finally, as technology continues to advance, we envision a future where AI-driven narratives become even more immersive, adaptive, and personalized. With the ability to analyze user preferences and behavior, AI algorithms can dynamically tailor stories to individual users, creating unique and customized experiences. Furthermore, the integration of natural language processing and sentiment analysis can enable AI systems to respond intelligently to user input, fostering truly interactive and responsive storytelling.

Overall, our future work would focus on continuously refining the narrative, improving scene design, exploring advanced software tools, and addressing the limitations and challenges posed by AI technology. By doing so, the interactive story project can evolve into a more immersive and engaging experience for the audience, pushing the boundaries of storytelling and human-AI collaboration.

9 CONCLUSION

In conclusion, the interactive story *Simonstown* demonstrates the transformative potential of AI-facilitated storytelling by integrating AI technologies throughout the production pipeline. In this paper, we focus on employing AI to address the challenges of visualizing extensive story branching, especially in the context of translation and adaptation between different media. We utilize AI to meet the demands for visual branching and offer insights into this process. By employing AI tools such as panorama generation and character illustration, *Simonstown* creates visually captivating scenes and characters, enriching the narrative experience. The results of this project highlight the power of AI to enhance creativity, expand audience engagement, and pave the way for further innovation and exploration in the realm of interactive storytelling.

As AI continues to evolve, it holds the promise of breaking traditional storytelling boundaries, transcending mediums, and delivering narratives that engage, challenge, and inspire audiences in ways we have yet to imagine. The journey of *Simonstown* is just the beginning, and we eagerly anticipate the future of AI-powered storytelling and its transformative impact on the entertainment industry.

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