AI for AUs: Challenges of Creating Interactive Virtual Characters for Immersive Fanfiction Sandboxes

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I discuss the potential of social and immersive virtual worlds as platforms for immersive fanfiction. In particular, I consider the unique difficulties of creating interactive virtual characters that can act as participants in immersive fanfiction and propose several potential directions for future research in this area.

1 INTRODUCTION

The *metaverse* is an ill-defined science-fictional grand narrative that has recently captured the imagination of certain tech executives [22]. One recurring feature of imagined metaverses [7, 14] is their potential to serve as environments for the construction of immersive *fanfiction*: stories that are based on settings and characters established in earlier narrative works by a different creator [9, 18].[1] In this vision, the metaverse would serve as a common platform on which users could inhabit fictional universes (or *storyworlds*) that they know and love from existing stories; interact with characters native to these storyworlds; and even blend aspects of these storyworlds together, perhaps casting several characters from the *Pride and Prejudice* storyworld into a modern-day coffee shop setting (a frequently-selected *alternate universe*, or *AU*, in fanfiction communities [16, 17]) or attempting to form romantic pairings between characters from the *Star Wars* and *Star Trek* storyworlds (in what is known as *crossover* fanfic [23]).

Characters [1], their relationships [9, 25], and their inner lives [9, 10, 12, 18, 25] are generally central in fanfiction, often to a greater degree than in the stories on which fanfics are based [1, 12]. This suggests that the kinds of people who are interested in the metaverse as a platform for immersive fanfiction will be especially concerned with the modeling and portrayal of character. A great deal of research has been done on how to create believable virtual characters [15] that can interact with players (in videogames) or human participants (in other sorts of virtual worlds). However, the challenges of creating virtual characters with which it is easy to construct fanfiction has not been much investigated, and the unique characteristics of fanfic as a form suggest several new difficulties for virtual characters research.

In this paper, I briefly catalogue several open challenges that appear when attempting to create virtual characters that can participate effectively in immersive fanfiction. Beyond defining a few potential directions for future research,

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[1]In this regard, the metaverse shares some similarities with the earlier science-fictional vision of the *holodeck*, which can also be viewed as a platform for immersive fanfiction to some extent: see, e.g., the titular scenario of Murray's *Hamlet on the Holodeck* [20].

I also hope that this paper serves to spark discussion on the questions that arise when the metaverse is taken as a platform for fanfic authoring—as it has sometimes been *implicitly*, but perhaps never before *explicitly*, presented.

2 OPEN RESEARCH QUESTIONS

2.1 Crossover Potential

Crossover fanfiction is a genre in which characters from multiple different storyworlds are brought together and allowed to interact with one another [23]. Part of the appeal of imagined immersive fanfiction platforms is their potential for crossover—for instance, the possibility of bringing a single character into multiple different storyworlds [14]—and recently, AI-based visual art tools that can create images based on text prompts (such as DALL-E mini) have been widely used to create images of improbable character crossovers [3], suggesting a high level of demand for character crossover among certain audiences.

From a technical perspective, interactive virtual characters in the past have largely been created under the assumption that they would remain within a single storyworld. This allows developers to make many simplifying assumptions about the domain of a character's behavior: a character authored for a particular videogame, for instance, could be expected to only interact with other characters in the same videogame, and would only need to respond to the particular kinds of player interactions that this game's mechanics permit. For virtual characters to participate in crossover fanfic, they would need to be able to operate over a much wider domain of potential inputs—so the rules that govern their behavior and personality would need to be authored in a highly general way. The necessity of generality, in turn, may make it difficult to design characters with the kinds of *legible* and *proactive* personalities that generally make for the most compelling play experiences [24].

This difficulty was anticipated to some extent by the developers of the Versu interactive storytelling platform [5], which aimed to allow all characters to be played by either a human being or an AI agent and to permit characters originally authored for one storyworld to participate freely in others. However, Versu's approach was only ever applied to turn-based text games (rather than visually immersive virtual worlds), and the potential for crossover was not explored in depth before the Versu platform was discontinued. Consequently, although the Versu AI architecture may serve as a useful jumping-off point for future work in this area, many open questions around authoring virtual characters with crossover potential remain to be addressed.

2.2 Tweakability

Fanfiction as a form is valued for its liberatory potential, particularly in how it allows members of marginalized groups to rewrite their favorite storyworlds to include them in some form [1, 4, 9]. Additionally—because fanfic builds extensively on existing worldbuilding and character definition—it can be viewed as lowering barriers to entry for inexperienced writers by giving them a clear jumping-off point for storytelling, thereby mitigating the fear of the blank page [11] and scaffolding the creation of more focused stories. To preserve these benefits of fanfiction in an immersive context, virtual characters must be easy for inexpert programmers to tweak and extend.

The requirement for character behaviors to be easily tweakable, especially via an approachable user interface, introduces significant difficulties from an AI programming perspective. Many existing frameworks for defining virtual character behaviors assume that every character is defined and maintained by a single programming-experienced author (or a small team of such authors working in close collaboration), and the formalisms in terms of which character

behaviors are defined may not readily permit a bricolage-oriented style of programming in which desirable behaviors are built up gradually by inexpert users through many small patches.

To realize the dream of approachably authorable interactive characters, it may be necessary to build on and further develop techniques for end-user programming [21] and programming by example [13]—in the latter case, perhaps allowing users to author character behaviors partly by roleplaying as these characters.[2] Alternatively (or in concert with more rules-based approaches), if character behaviors are defined through machine learning, tools for rapidly *fine-tuning* character behaviors and sharing fine-tuned variants of characters are likely to be important. Casual creator design patterns [2], especially related to modding, hacking, and sharing of creations, may also prove a useful source of inspiration in this area.

2.3 Ownership, Canonicity, and Fanonicity

The culture of fanfiction writers is often at odds with the capitalist formulation of intellectual property and the tendency of non-fan storytellers to position themselves as the ultimate authorities on the storyworlds they have created [1]. It is common for fanfiction communities to collectively overrule the officially endorsed "canonical" understanding of a character's motivation or background (for instance) in favor of a shared "fanon" that resonates better with the majority of fanfic writers [25]. Even when no shared fanon can be determined, individual writers often still develop a personal, canon-deviant "headcanon" about certain elements of the narrative work on which their stories are based. Attempts by the creators of upstream works to override fanon, or to shut down "misuses" of a character by fanfiction writers, are often met with significant resistance by the fanfic community—and the *fix-it fic*, a major category of fanfiction, specifically aims to patch fan-perceived problems with the original story on which it is based [6].

Consequently, a platform that aims to enable immersive fanfiction would likely benefit from adopting a communal model of character ownership, in which character tweaks can pollinate from one user to another in a distributed fashion, and the tweaks and updates made by a character's original author can be explicitly rejected by others who feel strongly about the character's true nature. This again suggests a model of AI programming as communal bricolage and tinkering rather than strong top-down behavior authorship, and it is not yet clear from a technical perspective how to implement such a model without introducing significant conflicts when attempting to recombine multiple different lineages of patches and tweaks into a single behaviorally coherent virtual character.

More generally, the values of the fanfiction community with regards to ownership are in direct conflict with the explicitly rent-seeking mode of character ownership envisioned by some would-be metaverse storytellers [14]. In the past, when the values of fanfiction platform holders have deviated from those of the fanfiction writer community, the community has actively developed new platforms more aligned with their values and discontinued use of the old [8]. To sustain a fanfiction-oriented metaverse, platform holders may have to give up on or compromise the model of centralized ownership that many tech executives would prefer.

3 CONCLUSION

Framing the metaverse as a platform for social, immersive fanfic creation suggests several new directions for research in interactive virtual characters. More broadly, it also suggests that the metaverse ought to be designed with the distinctive values of transformational fandom in mind [8] if it aims to achieve widespread adoption as an environment for immersive storytelling. These values, which include an orientation toward remixability and distribution of narrative

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[2]A roleplaying-based interface for authoring dynamically responsive character behaviors might build on the use of roleplaying to define static *animations* for virtual characters that are intended to be deployed in immersive virtual environments—see, e.g., McVeigh-Schultz et al. [19].

authority, represent a radical departure from a vision of the metaverse as the ultimate platform for centralized capitalist ownership of storyworlds—which may lead to conflict in the future.

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