# Toward Prose Performances: Reflective Practices in Social Simulation

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**Abstract**

Social simulation is a field with many challenges. On the one hand, simulations are deeply technical and challenging to work with, and yet they are also exceedingly varied. This position paper draws on existing literature to identify two 'simulation rhetorics' which enable interactive dramas, and other systems involving social models, to make compelling claims about our social lives. These are the appearance of emergent behavior and the experience of world-building, which each depend upon the dual role played by the interactive drama's author as both its designer and its critic. In the process, we identify both technical threats and evaluation problems facing social simulation researchers, due in part to the high bar set by prior art. This paper seeks to collect craft knowledge on social simulation from throughout its history, in order to address what simulation does for reflective practitioners by enabling deep forms of expression.

**Keywords**

Social simulation, Critical technical practice, Open-endedness,

## 1. Introduction

This position paper examines the expressive potentials of text-based social simulation from various lenses of development and design. Although social simulation work continues to enter the literature, it is hard to understand why we make these, or how we should evaluate them, without a clearer account of *what authoring does*. While the technical systems are artistically compelling in their own right, what questions are we trying to answer, and how will we know when we have answered them? This paper draws on prior works from diverse domains ranging from computer graphics systems, to natural language processing, and transmedial theories of interactive media. These sources of context enable us to address how the *critical technical practice* of social simulation may strengthen claims made by technical games research about its unique relevance to questions of deep personal expression.

This discussion is made more challenging by typical distinctions between *designers and critics*: the designer who merely creates the performance, and the critic who merely consumes it. An example of a videogame which queers this distinction is offered by The Elder Scrolls III: Morrowind (2002), a commercial immersive simulation which ships with the original content-authoring tools used by its development team. A metafictional flourish within the lore of the game-world is the concept of CHIM, a transcendent metaphysical state which obliquely describes a character who has realized they are the avatar of a developer or player with access to said authoring tools (e.g. the trickster-god Vivec, an NPC and the occasional avatar of designer Michael Kirkbride[1]).

Drawing on a term from Nordic live-action roleplaying (LARP), we see that CHIM may describe *bleed* between the author-as-player (who experiences the fictional world as their in-game character), and the author-as-designer (who experiences the game-world as a malleable fiction) [1]. According to LARP tenets, the player and the designer are never really separate people, but simply two roles that every co-author of the simulation game must shift fluidly between. Thus, we posit that practitioners of social simulation, as the authors of technical systems and role-playing games, are engaged in an reflective design practice with deeply interdisciplinary roots across both games and human-computer interaction.

This position paper is divided into four sections, each containing the requisite background to make its claim. **Sections 2 and 3** deal with the challenges of authoring for the complex technical systems which are used to produce both expressive character animations and speculative models of social worlds. **Sections 4 and 5** contain discussions of worlding through fictional role-playing, and what the strengths of text and prose might be in relationship to these forms of authoring. This paper's **conclusion** addresses social simulation authorship as a *critical technical practice*, drawing on Philip Agre's definition [2] of a reflective design process mediated by technical artifacts. By their nature, games and simulations require an experiencer; yet when author(s) themselves are the intended experiencer of a given artifact, what standard of evaluation is actually possible?

This paper addresses social simulation authors and other practicing artists, as well as social simulation researchers who seek to ground claims about the expressive potential of this emerging medium in the extensive literature of both technical games research and games media theory. This paper aims to support nuanced discussions of the deeply technical, richly expressive practice of social simulation, and to unpack the differences between research agendas that lead in this direction.

## 2. Character Behavior Authoring

People tell stories from a very young age. Imagine a child who has just thrown their dinner to the ground, screaming; perhaps you would like to know why? It is socially imperative to account for our own actions, past a certain age. Yet these explanations will require substantial introspection about internal faculties like righteous anger and existential dread that do not particularly like to explain themselves. Perhaps this explains a tendency among AI researchers to underestimate how incapable virtual agents are at accounting for their own behavior.

Based on her work with the Oz Project and notably prefiguring explainable AI, Sengers describes agents with increasingly large repertoires of behaviors as getting more and more obtuse: "Programmers can create robust, subtle, effective and expressive behaviors, but the agent's overall behavior tends to fall apart gradually as more behaviors are

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[1]https://www.imperial-library.info/content/trial-vivec

combined" [3]. She explains that divide-and-conquer methods of software engineering inherently tend to strip away the relationship of one action to the next, which is essential to integrating sequences of behaviors. Therefore, Sengers employs the lens of narrative psychology, which seeks to avoid reducing patients to a mechanistic set of rules. The agents should not forget what they were doing, nor fail to make up their minds. This lens in turn supports the design of *dramatic agents*, which must (seem to) possess their own narratives.

In the course of behavior authoring, it is critical to understand the legibility of individual character actions, regardless of graphical or textual representation. Even though domain-specific languages have been created which take up these concerns, such as ABL for joint character actions [4] and Gertie for character animation [5], they have not (to our knowledge) seen independent reproduction, at least not in the research literature, despite the technical problem evidently being tractable.

The high cost of graphical fidelity to action is another culprit in non-reproduction. It is more common to see fully-animated 3D characters in the behavior-authoring literature than say, 2D paper dolls[2] or screenshots of visual novels[3]. We argue that it is entirely reasonable and prudent to cut down the asset requirements of character drama - in the sense of *making behaviors self-evident through precise movement*, - because while animations do act as vital signifiers of activity and intent [6], not all signifiers need to be animations. Too many research projects fail (either completely or in gaining traction) because they try to emulate big-budget videogame development too closely. It is more prudent to adopt the strategy of the visual novel or interactive fiction, in which the same function is served by fixed poses and little dioramas of action, or by script and prose.

## 3. World-building as Reflection

We firmly believe that social simulation itself empowers authors to reflect on what is essential to different possible identities, in different possible worlds with their own social norms, according to their own interests. Azad and Martens are correct to note that any single social model necessarily privileges certain ways of being over others [7]. The anti-psychiatric line of critique, which concerns a carceral state operating on grounds of mental health, is deeply pertinent to AI as a locus of political power [3, 8]. In the context of *reflective design*, Sengers argues that metaphorical representations serve as a valuable tool for interrogating assumptions and articulating specific critiques of the built world [9].

Much like fictional writing, social simulation is usually purposeful and sometimes transformative. For example, a model of a small activist community produced by Dickinson et al. [10] describes positionality, relationships, and various internal factors as the multitude of forces which govern who may speak in a given meeting. We compare the act of authoring this model to Becca Schuch's retelling of her own ambivalence toward creating a 'painting goblin' in the Sims 2 [11]. A painting goblin is a Sim whose tireless labor enabled the author's other Sims to lead happy lives free of financial stress. Shuch's ambivalence toward the goblin - who seems content, albeit not included in the escapist revels of Schuch's other Sims, - demonstrates that Sims 2 does not merely replicate capitalism as a social order, but also serves as a vessel through which retellings authors articulate critique and imagine how things might be otherwise.

Simulations and retellings are not entirely extricable from one another. World-building itself is an act of transfictional storytelling [12], such as the multiple competing lines of in-universe propaganda which supported the launch of Deus Ex: Human Revolution. Maj goes on to argue that emergent narrative belongs not only to Umburto Eco and other authors, but also to readers who regularly produce crossovers between worlds, select personal vantage points, and otherwise immerse themselves in fictional worlds. Kreminski and Mateas likewise claim that interactive storytelling deliberately conflates player experiences with authorship, by cleverly inviting retellings of emergent narrative experiences within the bounds of a shared model of the world [13].

If social simulation models are really worth evaluating, then the element of reflection is impossible to elide. Murray's aesthetic categories of *immersion, agency, and transformation* are not structural properties of the narrative artifact, but rather aesthetic effects experienced by the critic [14]. Transformation, as Mateas interprets it, is a difficult category because it deals with the critic taking on other perspectives in a variety of ways. Bad News [15] models a large number of agents, but only embodies one at a time in live performance, placing them directly in conversation with the critic. By contrast, Why Are We Like This [16] encourages the critic to describe relationships between agents that may follow interesting trajectories, taking on an authoring role.

In a world with the technology of the novel—that is, the set of literary conventions that let us interpret text on a page as the interiority of a fictional character—it is not difficult to believe that the social lives of individual agents might be an interesting thing to simulate. It is substantially harder to pin down specific categories of action through which these agents may (autonomously) share space or information, and gradually come to hold intimacy with each other. Following Azad and Martens, we observe that the nature of spatial embodiment (and time), knowledge representation (and character personality), and relationship depth (and power dynamics) varies wildly across the literature. It is useful to invoke Lahey here, who positions social narratives themselves as sites of discourse (and not as impartial arbiters of truth), and illustrates how authors may engage deeply with text-worlds linked to their own real-world troubles [17].

## 4. Open-ended Possibility Spaces

*Emergent narrative* in social simulations arises from interlocking suites of autonomous behaviors belonging to various agents in the world [18]. In game design, *emergent gameplay* refers to goals that players are able to discover and strive toward, as a function of game mechanics and level design [19]. By analogy, emergent narrative is characterized by the existence of player retellings that are enabled by the game's worldbuilding and behavior models [13]. At this point, we can integrate Aylett's original definition of emergent narrative, which argues that agency is experienced more strongly by a player who defies prior narrative goals; yet too much player defiance makes the authored story fall apart, presenting a paradox [20].

If level design is progression design in a navigable space, then narrative design is progression design in the state space

[2]https://wildermyth.itch.io/wildermyth
[3]https://quakefultales.itch.io/tracks-in-snow-showcase

underlying a quest system or other social model. Works of interactive fiction are known for concealing their door-opening states behind puzzles, whilst the Metroidvania and survival-crafting game genres make 'player upgrades' more obvious. Even games without direct embodiment, like The Sims and most idle games, contain progression mechanics like 'skill levels' that conceal most of the affordances available to individual agents from the outset of the game. Recently, Soros and Guttenberg analyzed the state space of a homebrew NES game using the concept of door-opening states, which correspond to both topological bottlenecks ('get out of the starting area') and conceptual bottlenecks ('execute a wall-jump') in game progression [21], i.e. there is more to be discovered, but only if you manage to go somewhere new or find a new way to do things. Similarly, Dendryscope introduced a skein representation of state space in a choice-based interactive fiction which supports graphical query authoring [22].

Harris identifies Lucretius' *clinamen* as a key figure in Italo Calvino's writing, a generative trope that "marks both the unraveling of a dominant code and the passage from one code to another", containing multiplicities that exceed (and fall short of) what the text appears to represent [23]. This is a claim about the space of possible readings, in the context of one or more readings, which characterizes exquisite experiences of emergent narrative. However, we believe that existing tools do not suffice to make the vast possibility space of computational dramas accessible to most authors. Say Anything, an exceptionally open-ended mixed-initiative prose authoring tool [24], demonstrated that behavior authoring no longer requires large amounts of extremely specialized writing, as long as it is possible to ethically gather high-quality collections of prose fragments. As we anticipate that more social simulation authors will explore how to give voice to different types of characters, we argue that progression design will be ultimately responsible for making these experiences memorable.

## 5. Quickness as an Open Question

Mateas characterizes Laurel's dramatic patterns as a set of organizing criteria above and beyond narrative, lending stakes to a series of related incidents through higher-level structures such as scenes and episodes [14]. In film, breaks between scenes are commonly known as 'cuts', and play a vital role in the narrativizing process of 'the edit' (i.e. deciding which takes to keep, and in which order!). Yet the problem of *where to place the cuts* has not been adequately addressed by prior social simulation literature. Rather, duration has mainly been explored in the context of schedules and pathfinding. In Clockwork, Azad et al. suggest the example of a student who goes to sleep too late, and so cannot rest the full 8 hours before their scheduled waking time, which may negatively impact their capabilities the next day [25].

The agent given 'cooking tasks' in the scenario designed by Agre and Horswill [26] has the improvisational capacity to recover from intermittent interruptions to their plan; but they aren't equipped to deal with long-duration interruptions by say, turning the burners off to prevent a fire. (Sims also lack this capacity.) If simulation-time is the duration it takes for agents to do things, i.e. they are animated one-to-one with these timings, then there appears to be no representational skew and therefore no problem. The limitations of this strategy can be observed in both The Sims 3 and Elsinore, as Elsinore NPCs can occasionally be forced to teleport by their own schedule; whereas Sims simply don't get to places on time, which ruins their dramatic timing. (The Sims 2, which has a scene where Mary-Sue Pleasant walks in on her husband's affair, employs a rigged event to transport her home from work early.)

In SimSim, Charity et al. explore the design space of functional single rooms which may sustain a single occupant whose needs slowly deplete, encouraging them to use various furnishings at various times [27]. The duration of need-satisfying actions is directly proportionate to their effectiveness, and movement also takes time, so it is entirely possible for agents to perish of hunger if the fridge is on the far side of the room. Walking time has become the dominant factor in a lot of agent-based simulations, because the transport time is often wildly out of proportion with the time spent on the task. Viewed from the long aesthetic distance, this kind of domain-mismatch is very funny, but it impedes getting up close to the character drama [28].

We propose that simulation authors may find a craft-based alternative resolution to the hard technical problem of *timing and duration* through the unique capacities of prose. Calvino identifies narrative time in prose as deeply malleable [29]: "I do not wish to say that quickness is a value in itself. Narrative time can also be delaying, cyclic, or motionless. In any case, a story is an operation carried out on the length of time involved [...] either contracting or dilating it." Calvino's relationship with prose is especially interesting here because the Oulipan practice of constrained writing entwines it with simulation. Thus, prose equips us with two drama-sustaining moves as authors: characters may walk out of the scene and become unaccounted for; and a clever choice of actions may change the span of time that is implied to pass.

## 6. Conclusion

The critical technical practitioner plays a key role in games research, as well as it sibling domains in HCI such as computer-supported collaborative work [30] and critical code studies [31]. We have observed that social simulation is rooted in co-authorship with sign-making systems. As a storytelling medium which draws on historic traditions of computational drama, social simulation is exceptionally well-positioned to support arguments for the meaning-making capacity of reflective design; but only if our community identifies clear strategies to evaluate social simulation artifacts, which are constructed in many different ways, reflecting idiosyncratic design processes.

In Section 2, we examined the legibility of individual character actions. Because dramatic agents need to appear to possess their own narratives, merely combining individual behaviors can fail to create believable or interesting characters. There are past projects that address the challenge of integration directly, but as they have not seen widespread replication, this remains a weakness in social simulation research. Further, the focus on fully-animated characters has overlooked many avenues for lower-cost research. In today's video game landscape, many notable narrative games avoid AAA animation in favor of lower-fidelity approaches, with great audience response and narrative success. Researchers should similarly be open to more textually-focused simulation.

In Section 3, we looked deeper at attempts at holistic agent simulations. Emergent behavior won't save us on its own: the agency is found in the middle zone between defiance and conformance. Further, the topology of the possibility space should include bottlenecks; one use of progression mechanics is to facilitate the gradual revelation of affordances. Calvino's use of the *clinamen* to disrupt the expected pattern is one example of how to design for emergence.

In Section 4, we argued that simulation empowers authors to explore different identities, social norms, and possible worlds. The simplified representation of a social simulation is not only enough to let the author picture the social lives of individual agents, but it is also able to reveal non-obvious consequences of the position the agents end up in, and to demonstrate perverse incentives which the author had not yet worked through.

Finally, in Section 5, we looked at the organizing structure of the simulation, particularly in how it relates to narrativizing the continuous simulation via the (implicit or explicit) editing cuts that shape our interpretation of the story. The problems of timing and duration have caused many otherwise serious simulations to acquire slapstick pacing as the pathfinding and scheduling problems dominate the ostensible dramatic moments. Prose authors such as Calvino have discussed the malleability of narrative time, and a prose-centric approach to narrative simulation is similarly equipped for more effective pacing.

In this paper, we have sought to tell the story of how the social simulation empowers the author(s) to hold conversations with themselves about character behaviors. We hope to encourage social simulation authors to consider the benefits of prose-based performance for character agents, both in encouraging more widespread use of prose-based social simulations and in inspiring more explorations of these concepts.

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