

# Creativity Support for Story Construction Play Experiences

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## Abstract

My research involves the design and development of mixed-initiative AI tools that provide players with creativity support in the context of story construction play experiences, especially those driven by malleable simulations that the player has a chance to help design or configure. To that end, I also study existing storytelling practices within game communities as a way of understanding what a desirable computational creative partner might look like; what features of computational systems tend to facilitate and frustrate creativity in their human partners; and what new creative practices might emerge as we create computational creative partners for new domains.

## Introduction and Background

Recent work on *retellings* (Eladhari 2018) has called attention to a family of deeply computationally engaged storytelling practices around digital games, particularly those that make extensive use of artificial intelligence and procedural content generation. Players who participate in these practices seek games out primarily for their potential as storytelling partners, and shift smoothly between several distinct stages of creative play: defining a storyworld (including its rules, locations, characters, factions, and other entities) in a way that permits computational simulation; passively observing the simulation as it autonomously runs; actively seeking out sites of narrative potential and information about what has happened within the simulation; intervening within the storyworld to provoke change; constructing stories based on the events that have transpired within the simulated world; and refining the simulation to better support the kinds of stories they would like to tell.

My research aims to provide explicit support for this form of computationally engaged creative practice through the development of AI systems that function as storytelling partners for the player, reframing the role of the human interactor from that of a player who experiences (and perhaps makes limited interventions within) a designer-defined story to that of a co-author who constructs narratives from the raw material of a simulation they helped to define.

My work draws substantial inspiration from Ryan’s notion of *curationist emergent narrative* (Ryan 2018), and es-

pecially the class of systems he describes as *story recognition* (Ryan, Mateas, and Wardrip-Fruin 2015) or *story sifting* systems, which are used to locate narratively interesting situations or sequences of events within a larger simulated world. Although Ryan seems to suggest that it would be especially beneficial to develop story sifting systems that can function in an autonomous context, he also briefly introduces the possibility of using these systems to provide support for a human curator. These mixed-initiative story sifting systems are of particular relevance to my own work.

My work is also directly inspired by Samuel’s notion of *shared authorship* (Samuel 2016), which describes co-creative processes in which neither the computational system nor its human user could have produced the resulting artifact alone; Liapis et al.’s definition of *mixed-initiative co-creative* systems (Liapis et al. 2016); and Compton’s notion of *casual creators* (Compton and Mateas 2015), which describes a class of playful creativity support tools intended for casual and non-goal-directed use.

## Past Work

(Kreminski and Wardrip-Fruin 2018a) presents a brief design analysis of a class of games that I refer to as “gardening games”. These games make use of procedural content generation in unconventional ways, not providing players with an “infinite frontier” but instead using generative methods to gradually evolve a closed simulated game world over time. This has the effect of creating worlds that seem to have lives of their own, with elements that continue growing, changing, and becoming more interesting over time, regardless of whether or not the player is active in the world at any given moment. (Kreminski and Wardrip-Fruin 2019) extends this design analysis with an explicit focus on creativity support, and suggests that many gardening games feature elements that help players overcome common barriers to creativity, including writer’s block and the fear of the blank page. In keeping with a long tradition of slotting co-creative systems into specific metaphorical roles—from the “clerk, partner, wizard, surrogate, and accountant” roles proposed in the context of AI-supported architecture (Vardouli 2012) to the “friend, collaborator, student and manager” roles described by users of the co-creative 2D platformer level editor *Morai Maker* (Guzdial et al. 2019)—this gardening metaphor may serve as a useful source of inspiration for interactive digi-

tal play experiences that look less like traditional games and more like digital co-creative partners.

(Kreminski and Wardrip-Fruin 2018b) presents a design analysis of the space of interactive narrative games that structure their narrative content in terms of *storylets*: atomic units of narrative content associated with preconditions, which dictate whether a given unit of content can be presented at any given moment. In particular, this work introduces the term *parametrized storylets*: storylets defined in terms of “slots”, which may be filled by any game entity that meets certain preconditions (e.g., any character that possesses a certain specific trait). Structuring narrative content in terms of storylets with defined preconditions and effects has several advantages: primarily, it enables greater flexibility in overall story structure (since the links between nodes are no longer static, as they are in branching interactive narrative structures) while also making story content more amenable to computational reasoning—including by computational processes intended to provide support for authorial practices of play.

(Garbe et al. 2019), to which I contributed, describes an AI storytelling system that uses planning—in conjunction with a library of user-supplied storylets—to generate interactive choice-based narratives, and to repair the generated narratives as needed in response to player actions. To date, this system has only been used to present players with generated stories in a traditional choice-based interactive narrative context, but by allowing players to modify either the library of storylets or the system’s planning goals directly, it could be used to create something closer to a shared authorship play experience. This may be a focus of future work.

(Kreminski et al. 2019a) reports on an ongoing project within my lab that aims to use AI and generative methods to provide creativity support for players in the context of a tabletop story construction game, where two players work together with a simulated storyworld and a set of AI-based coauthoring tools to tell a collaborative story in the cozy mystery genre. This work is inspired by the interactive AI-supported theater experience *Bad News* (Samuel et al. 2016), as well as by analog story construction games such as *The Quiet Year* and *Microscope*.

(Eladhari 2018) calls for the use of retellings—the stories players tell about their experiences in games—as an instrument of critique. Building on Eladhari’s suggestions, (Kreminski et al. 2019b) makes use of grounded theory methods to analyze retellings posted to public forums. We used this analysis in conjunction with player interviews to conduct a human-centered evaluation of two AI-based commercial games (*Civilization VI* and *Stellaris*), as well as experimental AI-based research game *Prom Week* (McCoy et al. 2013).

## Future Work

Beyond Eladhari’s suggestions, my interest in retellings also stems from my belief that the construction of these retellings represents a new form of deeply computationally engaged creative practice; that some players are already seeking games out primarily in order to use them as storytelling partners, despite the games in question not having been explic-

itly designed for this purpose; and that we should be explicitly designing to facilitate this emerging style of computationally engaged creative practice, rather than designing traditional games and hoping creativity support simply falls out as a side effect. Therefore, as an extension of my existing work on retellings, I intend to conduct expert interviews with a number of creators of unusually well-known and well-made retellings. I will use these interviews to gain further insight into why players seek out certain games as storytelling partners over others, what features tend to facilitate and frustrate player creativity in a story construction context, and to conduct a requirements analysis for computational storytelling partners.

*Alice and Kev*—a lengthy serial story about the experiences of a homeless family in *The Sims 3*—is one example of a retelling whose creator I intend to interview: Robin “roBurky” Burkshaw has also created a number of other *The Sims 3* retellings, and more recently has undertaken a project<sup>1</sup> to modify *The Sims 4* to improve its effectiveness as a storytelling partner. However, high-quality retellings are also prevalent in some other game communities, such as the *Dwarf Fortress* community, which has produced a number of lengthy multi-author retellings—some with multimedia additions such as illustrations or an original soundtrack. Several professional sportswriters have also produced elaborate retellings of their experiences in sports games, and would be ideal candidates for this study.

Outside of retellings, I intend to continue work on the ongoing project within my lab that aims to provide computational support for player creativity in tabletop story construction games. This will involve the development of a story sifting system targeted at mixed-initiative rather than autonomous use, with the goal of surfacing sites of narrative interest within an evolving simulated storyworld on the player’s behalf. The same story sifting system, or a similar one, may also find application within *Diarytown*, a game being developed by one of my labmates that uses players’ real lives as material for play via diary entries crafted from a symbolic action library. In this context, a story sifting system will be employed to find patterns of narratively interesting events within player diary entries, and to prompt player reflection on the different narrative frames they could use to make sense of events in their lives.

Finally, building on my earlier work with storylets and the StoryAssembler system, I aim to create an approachable authoring tool for simulationist storyworlds that enables users to create their own storylets. This is inspired both by Martens’ Ceptre language (Martens 2015), which permits users to specify the rules of an interactive simulation in a way that closely resembles the structure of parametrized storylets, and by Samuel’s Writing Buddy system (Samuel, Mateas, and Wardrip-Fruin 2016), which permits users to author a library of parametrized story beats. The ultimate goal of this project will be to realize a malleable simulationist storytelling tool that facilitates users in shaping the simulation to better support their own storytelling practices.

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<sup>1</sup><https://roburky.itch.io/sims4-meaningful-stories>

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