EG UK Computer Graphics & Visual Computing (2025)
Y. Sheng and A. Slingsby (Editors)

The Persistence of Agency within the Virtual World

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Abstract

This paper explores player agency in video games to consider the impact of visual persistence within the virtual environment. Drawing from philosophical, psychological, and game design theory, we argue that a player's perceived impact on the virtual world, manifested through visual change can strengthen engagement and immersion. We support this with examples from commercial games. We propose that reactive environmental design, supported by approaches like agency informing techniques and player modeling systems, can reinforce a player's sense of agency through persistent visual feedback. This paper argues a direction for future research into this novel research space.

CCS Concepts

• ***Human-centered computing*** → ***Visualization theory, concepts and paradigms;***

1. Background and Motivation

Agency has been a key part of games research for many years [WFMDS09a, Mur17, Chu99] with a focus on how we can make players feel like their actions and choices have impact. Defined as the ability to witness the results of a meaningful action [Mur17], Mateas posited that "If, every time a player enters the dramatic world, roughly the same story events occur regardless of the actions taken by the player, the player's interaction would seem inconsequential; the player would actually have no real effect on the story." [Mat01], highlighting the importance of a player being able to gain feedback from their actions but also has repercussions for the persistence of said feedback.

Agency is a term that was first introduced within the field of Philosophy to explore why we make choices and how they impact life [Fer22, Hie19]. Significant work has been carried out to explore the phenomenon of agency whether it be older works establishing why humans decide to perform an action [Bro09] or recent work on the complexity of the intention behind a choice [IN14].

Agency within video games has been explored from several angles such as transformation [Mur17], measurement [TODE17, KPB21], and player experience [MSP07, WTCD18, BSS25]. Within the literature, discussion is often centered on the exploration of Agency on the narrative of a game or the player's character. Despite agency being a core part of virtual worlds, little work has been done discussing the player's effect on the world they inhabit and the effect that has on the player's journey.

Modern video games are a visual art form with the environment being a key element in their construction [Sch08]. Within some games, events occur that demonstrate the players visual impact on the world that they inhabit, potentially giving the players an emotional, empathetic relationship with the digital environment. Established literature within the field of agency portrays that the perceptions of that impact is an integral part of agency [TBSR10, RSDA08].

This position paper argues the need to discuss agency from a wider perspective than that of the player's controlled character and how we can visualise the player's impact on the world around them and the repercussions going forwards as a way of increasing player agency without the need to instead give the illusion of agency.

2. Concepts of Agency in Literature

In literature, agency can be defined as "the satisfying power to take meaningful action and see the results of our decisions and choices" [Mur17]. In literature it is a challenge for anyone other than the author to have agency over characters due to the non-interactive nature of the medium. Murray makes the argument that if the audience of a performance of Peter Pan decided that they did not like Tinkerbell and thus did not clap to revive her, the play would not branch down a different path of narrative. Games on the other hand have the addition of the player into the mix who typically decides the actions of the player, within the world of the player.

Murray adapted her definition of agency within the updated edition of her book; "When the action is motivated by something in the story[...], and when the response rewards the anticipation in an appropriate way, then the interactor experiences Dramatic Agency" [Mur17]. Whilst Murray's definition comes from a slightly different context, her definitions align with established definitions from psychology in that Humans, when influenced to do so by an external source, will perform an action and when the situ-

DOI: 10.2312/cgvc.20251213

(a) *Prior to the Stormcloack rebellion questline* **(b)** *After the player has invaded and taken the city*

Figure 1: *Impact of player decision making during the Stormcloak Rebelion on the City of Whiterun, Skyrim 2011*

ation around them responds to their action whether visual or not, they experience Agency.

As part of her work, several key characteristics of a digital environment are outlined with Transformation being of particular note, outlining how an interactor's experience of a story can differ based on a change of the environment despite the same actions taking place. Another characteristic is the idea of Procedural authorship, in which a writer/designer must be able to anticipate an interactor's actions and author events to correspond with those actions. One way in which Murray proposes these multiform experiences is through the concept of frames in which an object has its own frame of memory which can be further split into individual states; for example, a toaster is a common object which would have its own frame of imagery, but then that toaster could be working or broken, old or new and so on. That same method of thinking can be found in some games that already implement elements of reactiveness within their environment such as Dying Light 2 [Tec16] and Dishonoured 2 [Lyo16],

Murray's work is referenced throughout games research as a basis for the subject of agency, with aims to expand Murray's definition to understand the phenomenon of Player agency [WFMDS09a] [Bod21]. Through the concepts of an iteractor performing meaningful action, the concept of agency is closely linked to the topic of Effectance [FPRW19]; the ability to have an effect on one's environment, which results in the phenomenon of efficiacy in which the player believes that their actions do have an impact on the world around them [Whi59] [KHF07]. Within the work, Effectance is described as a motivation, in that if an organism believes that their choices will have an impact on the world around them then they will be motivated towards performing similar actions and thus expecting to see similar reactions from the world.

3. Agency in Psychology

Within psychology, agency is typically defined as the ability for human's to have an impact on their lives [Bro09] or a human's ability to act within the world [Hol83, Bru93]. Brockmeier drew connections between the idea of human agency and meaning via the example of Koffka's mailbox [Kof35], within the paper it is proposed that a human's actions are influenced by the meaning of their surrounding environment, previous actions and experience. This proposes a loop of meaning in which an object's meaning informs our actions, then the resulting action will create further meaning to then inform our next actions; this concept is supported within games design by a concept called the Player model or 'gameplay atom' [Coo07] in which a player's action causes some form of visual feedback within the game that will then create a new model to inform the player for their next action.

Bandura et al break down the definition of human agency down into four distinctive properties [Ban06];

- Intentionality, the idea that there is a reason behind the action that someone plans.
- Forethought, the action was planned ahead of time with an idea of what the outcome would be.
- Self-Reactiveness, the ability to perform the action as well as the steps that lead to that event.
- Self-Reflectiveness, the ability to reflect on their actions to inform their next steps.

These four properties refer directly to the meaning behind an action taking place, once again linking into the topic explored by Brokmeier and Koffka, but also re-enforcing this root definition from Murray in that the sense of agency within a digital environment revolves around a meaningful action, an action full of meaning and intent.

Whilst human agency explores the impact one can have on their own lives, player agency can be interpreted as the study of the impact that a player can have on the lives of the character they inhabit within a game [Eng20], this can be explored in a variety of ways whether it be Player Agency with the player's journey within a game or World Agency with the players impact on a virtual world.

4. Agency in Games

Skyrim is renowned for its player agency [PO21], placing the player in the role of a hero destined to save the world from dragons [Stu11]. Alongside the main questline, players can pursue side quests that deepen their understanding of the game world. One such

example is the 'Stormcloak Rebellion', which not only offers lore insight but also allows the player to significantly alter the world (see Figure 1). Depending on their allegiance, players engage in a civil war campaign that results in visual changes such as ruined cities and the deaths of key characters. This quest exemplifies Murray and Holzkamp's definitions of agency by offering meaningful choices that reshape the game environment.

On the other hand, Mass Effect [Bio21], a game similarly known for its player agency particularly with player choice [Kac13] and its impact on the narrative and the world around, affords the player quite a lot of choice with little impact on the world. These choices can range from decisions that affect the player's companions paths or deciding whether one species in the universe should survive instead of another [Roi15]. Whilst these choices have significant impact on the narrative of the game, little impact is demonstrated via visual cues in the environment due to the fact that exploration within the game is limited, as opposed to the open nature of Skyrim, meaning that once a quest is complete the player does not get to see the results of their actions within the world itself beyond a cutscene. This concept contradicts Murray's definition of Dramatic Agency in that detaching the player from the character and their interactions can also detach the player from that connection to the world and result in a reduced sense of agency.

Mass Effect's use of player agency becomes particularly divisive in its final act. As players progress through the third game, choices become increasingly limited, culminating in a conclusion where the protagonist alone must make a final decision, seemingly unaffected by prior actions. While this shift frustrated many fans [BBC12, Tas21], it exemplifies how the restriction of agency can heighten narrative impact, confronting players with the inevitability of a fixed outcome.

That same logic can be applied to the visual side of agency, whilst it may be apparent through the narrative that the player's choices have an impact, the pay off from that choice may not always be immediately evident.

4.1. Designing for Agency in Games

When Designing games there are many concepts that revolve around giving players a sense of Immersion, Agency or Efficacy [Bod21], Bodi definines agency as something that "[...] can be conceptualised as the possibility space for meaningful choice expressed via player action that translates into avatar action, afforded and constrained by a game's design.". Here, the idea of agency being restricted wholly to narrative is challenged and instead applied to multiple aspects of a games make-up whether it be control over the character or even the visuals of the game world.

Schell [Sch08], explores games development through a variety of lenses, three of which relate closely to agency; The Lenses of *Freedom*, *Emergence and Consequences* and *Meaningful Choices*. These lenses serve as tools not just as forms to analyse games but also a set of questions for developers to ask themselves when developing these features into their own games. In a game such as Skyrim if the player were to clear a raider camp but finds after 10 minutes the player returns to find raiders have reappeared, is there meaning behind the players actions or has their effect on the world been diminished? Freedom and Emergence as lenses can be linked together nicely here, with Emergence involving the amount of actions that a player can perform at any one time and Freedom referring to the players ability to have free choice within their game.

Within Bodi's expansion of the understanding of Agency within video games, he frames agency as a possibility space with the idea that its not just about the ability to take meaningful action but the freedom to choose to take that action [Bod21]. Freedom is often developed into games in a few different ways whether it be the offering of multiple paths to a player's objective, offering more methods of interaction to the player or through branching narratives [Kli09]. Kline identifies a flaw in these methods in that the more freedom the player is offered, the more work that creates for the developers, this can also be reflected through Schell's discussion of the Lens of Freedom [Sch08]. Schell suggests that constraints are an important factor to consider when designing for agency; giving players options as opposed to completely free choice still gives the player the same sense off freedom whilst also keeping grounding the player within the rules of the game world [Ada13] and easing the burden on the game developer through the reduction of complexities from the technical implementation [Mur17, Dom13].

4.2. Reactive Agency

To circumvent the technical limitations of implementing a wide variety of choices within games, recent works attempt to facilitate methods of increasing percieved agency through a variety of means such as the use of AI or advanced technical frameworks [TBS08, TBSR10].

In 2017, Agency Informing Techniques (AITs) began being explored, defined as "a technique used by game designers and developers to convey a sense of agency to a player" [DZ17]. Their work revolves around examining methods of increasing a player's sense of both Theoretical Agency and Perceived Agency.

Perceived Agency is defined as the player's perception that the actions they take do have an effect on the world whereas Theoretical Agency is defined as the player's ability to actually affect their experience [TBSR10]. Within their work Day and Zhu examined a variety of methods for enhancing the perception of a player's agency within games through UI, Player appearance and branching narrative points, however the potential of conveying a player's agency via the virtual world as is present in games such as Skyrim and Dishonoured are not discussed here, instead focusing on communicating to the player that the player's actions do have an effect either with minor changes in aesthetic, User interface or narrative choices.

However, AITs can have a mixed impact on Player Agency within a Narrative Experience, particularly when a UI Cue tells the player that there will be a consequence [DZ17]. Telltale's The Walking Dead [Gam12] is used here as an example where such UI cues are used to inform them that their choices matter however during the time that they played the game, the perception of how that choice effected the game is not revealed. This relates back to Schell's work within game design specifically to the Lens of Feedback [Sch08]. Here Schell discusses how immediate and continuous feedback are essential components towards motivation, encour-

agement and to give the player a sense of progress. This idea once again can be seen within the example of Skyrim in which the player chooses to invade Whiterun, the player then finds the city under seige and ablaze, then once the seige is concluded the city remains with the scars of the battle, serving as a consistent reminder for the player.

Furthering the work of Reactive Storytelling, the PaSSAGE framework was developed [TBS08], Using an AI system, the player's actions and choices will result in narrative and events adapting to create a unique experience. When a player hits a trigger within the game world, the system evaluates the player model to decide what should happen next, that next event is decided based on their choices as well as their preferences in gameplay, so that if the player prefers an aggressive play style they are more likely to encounter combat scenarios. This framework hinges on the idea that for perceived agency to increase, the consequences of the performed action must also be desired [TBSR10, TBSR11], showing that when the events that occurred correspond to the expectations of the player and their previous experience they do result in the positive feeling of agency as supported by both works in Agency [Mur17, WFMDS09b] and game design theory [Sch08].

5. Discussion

The literature surrounding the topics of agency as well as game design theory portrays agency as a key factor for player motivation as well as an intrinsic pleasure of the digital environment. In games development, there are established examples where the game world can tell stories or imply them, this is referred to as 'Environmental Storytelling' [Ste15] or 'Narrative Intelligence' [RSDA08]. This is where a carefully placed object within the game world can be used to convey stories to the player. The example of a skeleton in the bath tub in Fallout 4 [Stu15] is a standout example of its usage, from those carefully placed objects, we can infer a story of a person taking a bath before the bombs dropped, On closer inspection however you see a toaster also in the bath revealing a more tragic story. Visuals through environmental storytelling are a key part in creating emergent stories within the digital world, meaning the stories that the player interprets based on their encounters [Mar20].

Whilst these terms are linked to games development as a method for designers to establish stories within the world, there are common threads existing between the topic of reactive agency and environmental storytelling, with the idea that the player's actions can cause an effect on the game world, those effects could serve as scar tissue that tell a story of the players journey throughout the world, all told through the world that the player's character lives in.

The established literature in both the fields of psychology and digital literature frame the visual component of the world, both digital and physical, as a key part of the player experience when it comes to their perception of their experience of agency but also the further development of a motivational loop that pushes the player towards their next actions.

Within reactive agency research, preliminary work has been done to identify areas in which games visualise player agency to increase its perception during gameplay, serving as a starting point for us to identify methods in which attention is drawn to these visual techniques. Further research has also been carried out when it comes to creating more tailored experiences based on a players agency which gives us some indication of how such agency rich gameplay moments could be created through the use of player models and AI systems, whilst these systems relate more-so to creating narrative moments for the player rather than the visual elements that we wish to investigate, the background theory and formulas used to create PaSSAGE serves as a starting point for us to look into implementing our own methods for creating reactive environments.

5.1. Future Work: A living Digital World

The goal of our work is to investigate agency within games separately from the narrative of the game and instead focusing on the visual affordances that an agency rich digital environment could offer the player.

To further our work the possibility of environment based AITs need to be explored, we need to examine how effectively reactive environments can be perceived by the player and to what extent. Change blindness is a phenomenon that is quite common within digital environments [SL97] where if a player is focused on a specific object or goal, any change outside of that focus can go unobserved. To that extent we need to examine what change the player will observe and how we can increase that perception.

We propose a framework to visualise agency on a controllable scale, expanding on the subject of framing as mentioned in the work of Murray. In which we can create parameterized objects within the world which as the results of a players actions we can change the descriptors of an object to coincide with the expected consequences from an action.

6. Conclusion

Within this paper we have broken down the discussion of agency in its multiple forms and used the definitions within that discussion to re-frame it away from a position of narratology but as an aspect of visual change, this lays the ground work for us to investigate ways in which we can create a more substantial relationship between the game world and the player through an increase in perceived agency as well as further investigation around to what extent that environmental changes can affect the player's sense of agency but also their player experience throughout the game from an emotional standpoint.

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