

The Self, Presence and Storytelling

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Who am I?

I am Thomas Grip, creative director at Frictional Games, a company most known for *Amnesia: The Dark Descent* (2010). I have been doing commercial horror games for over 6 years as part of Frictional Games and have over 10 years of experience as a hobby developer in the same genre.

Introduction

This paper is essentially an extended version of a talk that I first gave at the Game Developer Conference Europe (GDCE) in 2012. The goal is to present a new way of designing games that can give rise to better storytelling. It represents an accumulation of knowledge from creating horror games and has been reformed into a more general theory. Hopefully, it can be used for any sort of game that wants to tell a story.

The paper is structured so the basic information is given in the first part of each section. It then presents more in-depth information in "Further Information" at the end. This can be skipped for readers that are only interested in a general idea of the design approach.

Stories and Black Boxes

Story does not really have an objective definition, nor do I think there needs to be one. Still, in order for this much of the content below to make sense, a definition is required. The one that will be used here is one that is common in both film and literature. Basically, a story is something dealing with: theme, setting, characters, plot and narration.

The theme is whatever it is that the story is trying to tell the audience. One could also call this essence or meaning. The setting includes things such as the environment and background information, i.e. data on the world that the story is set in. Characters are the people¹ that make up the story. Plot is a string of events that happen over the course of the story. Finally, narration is the way in which the story is told to the audience.

This means that any game that has a focus on one or more of these elements is a game with storytelling. For instance, *Final Fantasy* (Square Enix, 1987) has plenty of storytelling and *Tetris* (Nintendo, 1989) has none.² There is, of course, not a binary division to this, but more of a spectrum

¹ If you want to be more technical, I guess "actor" or "agent" are better words.

² Although one could argue that *Tetris* does have some tiny fragments of a story (given the definition) I think that is simpler to just say it has no storytelling at all. Another important point is that *Tetris* has no intent of telling a story,

with games that are entirely about storytelling on one end, none at the other, and everything else in between.

In this paper I will discuss video games with a focus on storytelling. This is important to keep in mind as some examples are not really valid for video games that have minimal storytelling efforts. There will, of course, always be borderline cases, but I do not think that will be a problem for the issues discussed.

Crucial to keep in mind is that the story is *not* just the plot or a set of predefined events; it is anything that deals with the elements listed above. Here is where the interactive part comes in. There is not much interactive that can be done with a plot other than choosing paths from time to time. But characters, setting and so on are things that we can properly interact with. *Interactive* storytelling means we want the player *play* the story, not just passively observe it.

It might not be apparent at first glance, but horror games are very focused on interactive storytelling. By this I do not mean the plot, but the goal to put the player inside a narrative. Horror games really thrive on this and fail without proper horror themes, characters and settings. This has led to us at Frictional Games to struggle with interactive storytelling for some time, and the experience and research we have gathered serves as a foundation for this paper. The goal is to present an alternative way of designing games, but before going into that the current state of storytelling must be discussed.

The first and most common type of storytelling technique is to have a linear string of gameplay sections bound together with cut-scenes. These games almost always begin with a few basic mechanics (usually jumping and shooting) that create the core gameplay experience. The game is then divided up in sections where the player is engaged in these mechanics. In order to tie these together or just have the protagonist perform other actions, some form of cut-scene³ is used. Examples of games using this are: *Uncharted* (Sony, 2007), *Another World* (Interplay, 1992), *Call of Duty* (Activision, 2003) and *Half-Life* (Valve, 1998).

The next type is quite similar to the previous. Again, it starts off with a few basic mechanics, but instead of a linear string of sections, the player is set loose in an open world to explore. To handle things unrelated to the core mechanics there are quests and expositions scattered throughout the game. Video games built around this concept include *Skyrim* (Bethesda, 2011), *Bioshock* (Irrational Games, 2007) and *Ultima* (Electronic Arts, 1980). The important take away here is that in both these techniques most of the gameplay time is spent repeating the basic mechanics. The other parts are just non-interactive (or at least severely less interactive) filler.

If we move away from these kinds of storytelling, games tend to remove all of the dynamic gameplay flow and interaction happens at a much higher level. The player tells the avatar to go here, chooses from a list of actions and so forth. All of these actions are very discrete and lack the flow that you can see in the games mentioned above. Controlling Nathan Drake in *Uncharted* (Sony, 2007) as he jumps and shoots bad guys is very different from how you control Guybrush in *Monkey Island* (LucasArts, 1990-2011). There is a much greater sense of fluency.⁴ However, all of

while the opposite is true for *Final Fantasy*.

3 I consider the type of scenes you see in *Half-Life* to be cutscenes. It might be in-game, but the player cannot really do anything besides stand and look.

4 Note that this is different from flow as coined by Mihály Csíkszentmihályi in *Flow: The Psychology of Optimal Experience* (1990) for when you are really into something. While the type of gameplay that I discuss can, and often has, a sense of flow in Csíkszentmihályi's sense, this is not what I mean. By fluency I mean that there is a constant flow of input to the player and the feedback is very responsive. There are all sort of degrees of this and not just a

these games focus on combat; they lack the range of actions that can be done in games like *Monkey Island*.

Looking at the history of these fluent games, we see that that the storytelling has remained very similar. *Uncharted 3* (Sony, 2011) uses the same some kind of technique that *Another World* did, and *Skyrim* is not all that different from a game like *Ultima*.⁵ This means that for the past 20 – 30 years very little has changed in how stories are told. There are many aspects of gaming that have gotten better, but the basic storytelling structure is essentially the same. It is quite clear that something is holding back progress, but what?

My suggestion is that the problem lies in the foundational design principle for these games. At the core of this design is a black box, a system unknown to the player. The goal is to intuitively figure out and master this box by interacting with the game's mechanics. For instance, in *Super Mario Bros.* (Nintendo, 1985), the mastery of jumping allows one to better traverse the games many chasms. Another example is how intuitive knowledge of the weapons in *Counter-Strike* (Valve, 2000) gives the player an edge over her opponents. I will refer to this as “black box design” throughout this paper.

When designing a game using this approach, it is essential that the mechanics of the black box have certain properties. They must be crafted in a way that makes the kind of intuitive learning and mastery previously mentioned possible. For this to happen the output from the mechanics must promote intuitive understanding. They must also include some form of mastery that the player can improve on after practice. Both of these requirements reinforce one another and almost always lead to some sort of competitive gameplay. In the end, only specific kinds of actions fit these requirements, reducing the space of activities possible.

Also, black box design encourages an optimization of focused play style where choices made are based on the mechanical gain instead of emotional attachment. For instance, the player will be drawn towards using the weapon that is most effective mechanically, rather than the one with most pleasing aesthetics. Because the design rewards mastery, any suboptimal decisions should give the player negative feedback. The player can, of course, to try ignore the feedback, but as this leads to a less engaging experience, it is very hard to do for any longer period of time.⁶ In order to have good storytelling it is imperative that the path of optimization is the same as the emotional one. For instance, when a player kills the bad guys from emotional instinct in shooter, this is also in line with the optimal strategy.

That sums up the biggest reason why storytelling games end up the way they do. With these limitations it is very hard to come up with good black box mechanics besides combat and movement.⁷ The rest of the paper will now present an alternative to this black box design. My hope is that the theory will allow games having a large set of actions feel fluent and be *playable* all the way through.

Further Information

I think that Raph Koster's book *A Theory of Fun* (2004) is a good introduction to black box design.

binary property, but I still it is possible to in general terms speak of gameplay of either fluent or not, as the occurrence of a middle ground case is rare.

5 The first *Ultima* from 1980 is really simple and is missing many of the finer points in the storytelling; it is mostly about combat. So I can understand that it might feel a bit far-fetched to compare *Skyrim* with it. But one only has to go to *Ultima VI* (1990) to find as good as elements from *Skyrim*.

6 And it may actually be impossible if the player needs to achieve optimal results in order to progress.

7 Unless you do something very abstract, but then it gets much harder to tell any kind of story.

While it makes the mistake of claiming that all games must be based around this concept, it sets up good goals for this approach. My paper casts this type of design in a negative light, but it is far from being intrinsically bad. There have been great games released using it. Raph also outlines how this kind of design is fantastic for learning and can help us change the way in which we view the world. My point is merely that it is not suited for a wide range of interactive storytelling, but only for those games that involve killing.

Jesper Juul uses a similar case to show how games can never tell stories. I agree with nearly everything he says, apart from where he concludes that games are incompatible with storytelling. Jesper's view on story is also very plot-centric which I do not agree with at all. See [here](#).

A Sense of Self

Before describing the actual design approach, the human mind must be discussed. This will include a lot of neurology and some philosophy, but will eventually come back to video games. The goal is to give a quick overview of how the mind works⁸ and use that to give a basic understanding of how immersion in games is created.

It is very easy to think that what makes up your self is a fixed entity that is not possible to change. When you consider the expanse of your self (your arms, legs, etc.), you have a very firm picture of what is *you* and that it is something set in stone. The reality is quite the opposite; what you consider as your self is highly malleable. What constitutes *you* is constantly in flux and far from a static phenomena. There is a great experiment that shows this in action.

Begin by putting a rubber hand on a table, and then ask the subject to put her real hand next to it. A screen is then set up in between to block off the subject's view from the real hand, allowing her to only see the rubber one. The rubber hand and the real one are now continuously stroked in the same place, and after a while the subject will feel as if the rubber hand is her own.

This impression can be tested by taking a hammer and quickly hitting the rubber hand with it. The subject will then pull back her real hand, feeling as though it was targeted. This is an unconscious reflex and the same action would not happen if the table was hit further from the hand. It confirms that the subject really believes—not just on a conscious level—that the rubber hand is hers.

A more subtle test is to measure the galvanic skin response (palm sweat)⁹ when threatening the rubber hand with a knife or other weapon. Again, this will produce a response as if the real limb was being threatened.

What happens in the experiment is that the continuous stroking of the real finger and the rubber one changes the brain's body image. This unconscious action of pulling away from danger is based upon a new sense of self. This is made possible by the repeated feedback loop that is created by feeling the stroke and seeing where the stroke is being made. If the stroking stops, the illusion quickly fades away. This shows how what we believe to be ourselves can be changed, and that it is the current state of input-output that matters.

The same technique has been used to transfer a person's sense of self to different objects.

8 Which, while not very common when thinking about the mind in ordinary life, is where all the scientific evidence points at. Some of the views are up for more discussion, but generally what is presented stands on solid ground. This is what 400 years of continually revised science of the brain points towards.

9 This is wildly used as a measurement for both stress and arousal.

Experiments have transferred people into dolls, allowed body switching, induced out-of-body experiences, etc. All this has been done with a feedback loop similar to the rubber hand experiment. It has also been shown that tool usage changes our body image to include the tool. For instance, when a hammer is wielded for long enough, the brain will make the tool part of itself. This is a bit different from the rubber hand illusion as there is no longer the same touch-see loop, but instead there is a feedback loop of doing and seeing. The result is nearly the same; the brain incorporates the tool as a part of its body image.

There are even more extreme examples of this, such as people that lose their sense of self completely after brain damage. There are even clinical reports of people who have denied that they exist all—this is called the Cotard delusion. The sense of self can be extended, but it can also disappear.

It is contrary to our everyday experience that we exist in this changeable self. We tend to believe that we perceive reality as is. But really what we perceive through our senses is just a simplified version of what is really out there. The reality really out there is an ocean of quantum waves that our senses, also just collections of quantum waves, gather and process. What we feel as this lush and colorful world our vision provides is just whatever scattered light waves happen to be collected by the small, movable holes in our skull.¹⁰

Our own sense of self is also made-up, based on input-output and pre-wired information in our brains. What we feel as “living in reality” is just our constructed virtual selves in a virtual world. What makes it all “real,” and not just a hallucination, is this feedback loop which supports what we see. This is used for our perception of the outside world and the representation of our selves. If you kick a rock, your foot stops moving and it hurts. Signals are sent to your brain indicating that all of this is happening, and if unsure, you can repeat the kick and the same signals will be sent. This means that you can be fairly certain that there really is a rock there and not just some figment of imagination. This sort of probing happens constantly and it is how we determine the basis of reality, both in terms of the outside world and of our sense of self.

But, as we have seen with the rubber hand experiment, this probing can fail quite drastically. To understand how this happens we need to quickly discuss how the brain works. The information siphoned into us (mostly from outside world, but also from inside ourselves) is often incomplete and our brains do their best to make a coherent picture from it all. Looking at the operation of our brain functions, there is actually equal activity going both ways. This means that not only is the brain processing information from the outside world, it is feeding just as much data back into the system—this happens on all levels. Whenever one part of the brain gets input from another part, it sends back the same density of information. This outgoing information is then used to make sense of any future data. For instance, it can be used to predict what will happen next and establish patterns. This means in order to properly build up an outer and inner model of the world, the brain needs to take previous data into account. A lot of what you experience is really just the brain guessing.

The neurologist Vilayanur S. Ramachandran has an analogy that the brain is like a general who is given large amounts of information just before going into battle, and then has to make a decision based upon what the different, many times conflicting, intelligence sources tell her. This process happens constantly and is beyond our conscious control. Usually the brain is quite apt at this and makes correct assumptions; we rarely notice anything strange. But at times there are situations like the rubber hand illusions, where the brain's guesses fail spectacularly.

¹⁰ [Here](#) is Richard Feynman going into more details on the weirdness of seeing.

In conclusion, our selves and sense of an outside world are something that is not firm, but constantly changing depending on what input the brain receives. Our brain is constantly evaluating and building up our mental picture of reality. Most of the time, it is beyond our conscious control. However, this model in our minds can fail if manipulated in the right way. What this means is that we can change what a person experiences as reality, not only in the outside world, but also about their own sense of being as well.

Further Information

A good summary of how our virtual selves are created can be found in the book *The Ego Tunnel* by Thomas Metzinger (2009). He calls the virtual self in a virtual world an “ego tunnel” and explains where it comes from and how it is constructed. It also includes fun information on false awakenings, happiness machines and other similar topics. For a summarized account on the book check out his [TEDx talk](#).

To read about the various ways in which our world view can break down, I would recommend *The Man Who Mistook His Wife for a Hat and Other Clinical Tales* by Oliver Sacks (1985). It has some great stories about people with various clinical problems and how they have changed their view of themselves and their world. I think these examples illustrate the fragility and subjectivity of what we call reality.

The information stream in our brains is neatly described in *On Intelligence* by Jeff Hawkins (2004). It even specifies how to implement this kind of system into artificial intelligence (AI). The book gives a good account of how the brain processes information. Also interesting is that all parts of the brain seem to process data in a similar fashion, meaning it can cope with input it is not normally used to. For instance, when you blindfold subjects for a longer period of time and teach them Braille, reading Braille will light up the visual cortex. This also shows how clever the brain is at processing new sources of information when evaluating the world.

Describing reality as an ocean of quantum waves is, of course, extremely simplistic and it actually gets even more weird. Every particle that we know is governed by the Schrödinger equation, which formulates the particle as a multidimensional wave. (You can visualize it as a ripple on pond, but that is just in two dimensions; in reality, this wave has far more dimensions than we can imagine.) You can then calculate how the particle's wave moves forward in time and interacts by applying the equation. However, we do not see the world as quantum waves. What we see is just a random cross section of the wave. Why we only see part of the wave has two possible explanations. One is that it is that some kind of collapse of the wave that happens when we examine it. Exactly what “examining” means is fuzzy and there is no consensus on how it would work. Another explanation is that every possible slice of the wave is real. This means that for every possible action a particle might take—like the direction it travels in—there is a parallel universe where this is true. Even though this is bizarre, it is the best explanation we have currently.

Science is not done probing the depths of reality, and if history tells us anything we are bound to discover more crazy features as we learn more. What you imagine in your head to be the world is just not there. And just as the world is completely different from what is imagined, so the self is different from what we think it to be.

Presence

So what does this changing sense self have to do with video games? The answer is that video games

provide the same kind of feedback loop that has just been discussed. It does this in a mixture using both the stroking (like in the rubber hand illusion) and tool reshaping of the body image. It is not something one consciously contemplates, but whenever you are playing a game with a tight enough feedback loop you change your sense of self.

All other media do this in part as well and it is mostly referred to as “presence.”¹¹ But what is missing from media like films and books is the feedback loop that games provide to the player. A movie or a book can only send signals in one direction. It sends you whatever it contains and you are unable to respond and influence future output.¹² Because of this, film and books can never stimulate us in a way that drastically changes our sense of self. This truly separates video games from other storytelling media.

A great example of this at work is in *Slender* (Parsec, 2012).¹³ This game is simplistic, but still manages to be quite scary. I think this is highly significant and not something that has gotten nearly enough focus. Over the years there has been a lot of discussion about how video games should try to achieve the emotional responses provoked by other media and how they have not accomplished this yet¹⁴. However, when it comes to feelings of fear and terror, video games are already there.

If a movie or book wants to build the same kind of emotional response as *Slender* does, a lot more work is required. You would have to spend time building a sense of place and a connection to the lead character. Much of this can be very hard to pull off effectively. In a game it is simply enough to put the player in an environment and the atmosphere comes almost immediately. It is the interactive feedback loop that makes this possible. To confirm watch someone play the game instead of doing it yourself. Interacting with the game is a totally different experience.

The way that video games can suck us into this virtual world and reshape our sense of selves is something I find profoundly important. So far we can see this best in horror games, but I see no reason for it being confined to this genre. Video games can produce love, sadness, amusement and all the other emotions that we experience from interacting with other media.

The main reason why horror is at the forefront is simply that it the easiest one to do. As mentioned when discussing *Slender*, simply putting the player in an environment with the right mood makes the feeling of fear arise almost instantly. Other emotions do not come this easy and require a more complex setup. For instance, it is very hard to give the player a feeling of being in love with someone by crafting a simplistic environment. This does not mean it is impossible. Though it has not been tried, it might end up not being that hard.

11 I do not have a good source on what to call this exactly and it seems like there is a lot of confusion within psychology as well. I first started using "presence" because of [this article](#). But as I started to research a bit for this paper it was harder to find sources. In virtual reality the concept of telepresence is wildly used, but when it comes to the immersion of other media there does not seem to be something similar. Because what I talk about is connected to telepresence, I thought the word could still be used. Just recall that when you consider other sources of media; presence is a much fuzzier concept (and it is very fuzzy in virtual reality too).

12 Actually, you can and this is an interesting sub-discussion on what makes a game. For instance, in a magazine you can decide where to turn your gaze, and you have some sort of interactivity. Further still, you can easily implement a "choose your own adventure" in a book. This shows how unclear any lines we draw for separating media will be. I will have to leave further discussion to another paper.

13 Check it out [here](#).

14 Guillermo Del Toro's silly comment that there is still not a *Citizen Kane* (1941) of games yet is an example of this. For some reason filmmakers like to make comments like this. A few years earlier, Steven Spielberg said an indication of maturity would be when "somebody confesses that they cried at Level 17," which again is a silly thing to say for many reasons.

The recently released *Journey* (Sony, 2012) is a good example of a game with a different emotional theme. It has managed to provide an experience many people have reported as being quite profound and spiritual. This has come from the feeling of being there together with another lost or helpful soul. And this is achieved by creating a strong sense of presence using interaction.

The important point is that this feature of video games does not come from the mastery of a system or from challenges. It arises as an intrinsic property of the interactive feedback loop. Black box design does not address this, but instead can actually be counter productive for the creation of presence (which I will get to later).

What all this leads to is the first axiom for my purposed design theory:

The main purpose of interaction is to create a feeling of presence.

Further information

Another reason why horror games have been so early and successful at evoking emotions from presence might be because they are much easier to frame. In order to tell a story in a video game you cannot use the same structure as in a movie. This makes it hard to lay out some kind of foundation for a game with an emotional theme and have something to start working from. With horror games this comes easily. For instance, almost all horror games rely on the “Enter Haunted House” scenario (early horror games like *Sweet Home* (Capcom, 1989) and *Alone in the Dark* (Infogrames, 1992) serve as examples). The game needs to play out quite differently than a film or book in the same setting, such as *Haunting of Hill House* (Jackson, 1959). Instead of having the book or movie as a starting point, one can simply imagine going into a haunted house and have that as a base. Many of the mechanics come easily from this concept and it is still able to evoke similar emotions and discuss themes similar to the movie or book. This is not easy with something like a Jane Austen novel. Having a mansion filled with suitors and some basics mechanics for interacting with them do not have the same feel.

Another interesting area of research to be explored is how hypnosis relates to games. In very basic terms, hypnosis is when a person agrees to join in and play with a leader (which could really just be oneself). While under hypnosis—it is undetermined if there really is a hypnotic state—people are highly susceptible, more keen on making things up and more open to taking part in various acts. This might be a state that is very useful for games. To enter hypnosis, again in basic terms, one just relaxes and focuses on something (normally someone talking, but anything can do as it is possible to hypnotize yourself). This sounds like playing a game. Actually, watching television and reading a book is said to be similar to being hypnotized, only lighter. Perhaps video games provide a stronger hypnotic trance than other media as well? If so, does this tell us anything useful? I do not have any answers here, but just wanted to put it out. I want to dig more into this if I have time, so if anyone knows of any research in this field, please contact me.

Maintaining Reality

While video games get the initial sense of presence almost for free, it is big challenge to maintain it. Looking at horror games, this is a big problem. Many of these start out really scary, but when you have played them for a little while the tension goes away. Why does this happen? What is it that makes you lose the feeling of presence that you had at the start of game?

The problem is how we evaluate our reality. Like mentioned before, we have a constant stream of

perceptions that we use to create our own virtual world. So, when immersed in a video game, you are really inside your own virtual representation of the game's virtual world. What this means is what you think of as the game world is really just what you perceive in response to the output that is given to you. This is just like with reality; you do not see what is really out there, but only experience a mental model based on the sum of all sensory input.

After the gameplay has gone on for a bit, you reevaluate your initial assessments of the game's world and start to see behind the curtains. This happens when AI is active, when characters repeat themselves, etc. What was once modeled by you as a living breathing world is uncloaked and a mechanical world is revealed. In a game that relies on having a strong sense of presence, such as a horror game, this is often devastating. It is the main culprit in why horror games lose their impact after some play time. This does not only apply to horror games, but also any game that relies on an emotional response from the player. The player is greatly affected if presence cannot be maintained.

This problem of the virtual worldview breaking down is well known in the industry. It is not commonly viewed as the presence feedback loop breaking, but usually just that the game is losing a sense of "reality" (real as in what makes sense to the game world). It is the same problem though. The normal way to fix this is to add more complexity to the system. If the AI does not behave like a proper human, it needs to be better; if the facial animations are not lifelike, we need to make them better, etc.

The problems here are manifold. Improving many of these issues causes an exponential increase in development time, assets and code. It simply gets harder and harder to do. The more complicated any system gets, the harder it is to predict, and you can get all sorts of unwanted behavior. This will work against what you were after in the first place. Finally, the more lifelike you make something, the higher the standards are set. It becomes easier to accidentally break the illusion.

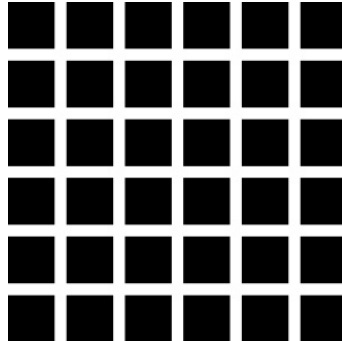
Many of these improvements usually mean some decline in another area. Take the evolution of dialog as an example. In the old days when there was only text and no animated faces, there could be many dialog options, the player could name characters whatever they pleased, and so on. But now, with new technology like proper voice acting and lip-synching, these things are too expensive or no longer possible. So by trying to make something seem more lifelike, other aspects have become more mechanical, which simply pushes the main problem elsewhere.

There is another problem in video games that adds to this. Pretty much all games are based on black box design, which means player strive to optimize the output of the system. The better the player is at predicting and using the rules that are in the black box, the better they are at the game. This means that most games implicitly task the player to unravel the systems that support them, thus breaking the spell of presence. The only way to stop this from happening is to have systems that can deal with close scrutiny. This is often hard to do, adds more complexity and sometimes does not even result in appropriate mechanics. In the end, it is really hard for a game system not to be viewed mechanically. In order to make a system that is fool proof, it needs to be extremely complex. But then it tends to become so chaotic that control is lost.

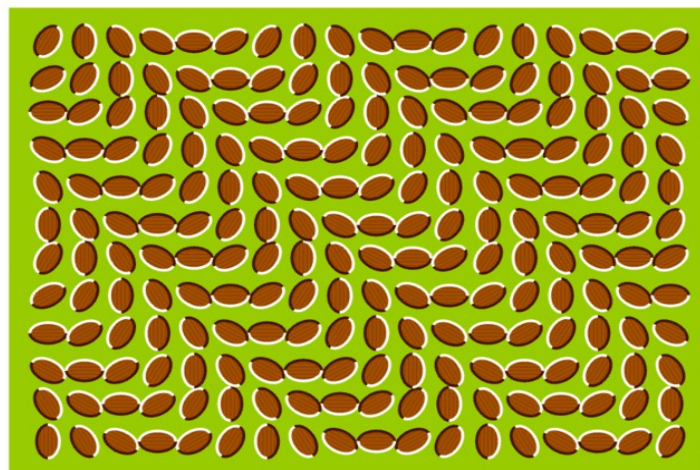
There is a solution to this problem: keep things simple, let the player fill in the blanks for themselves and make the systems seem more complex than what they really are. Our brains come to the rescue as they are very apt at this. The mind constantly takes incomplete data and makes a coherent picture of it. For instance, when looking forward you think you see a large detailed canvas of what lies ahead, but in reality your eyes are only able to clearly see a small fraction of the field of view. Only through many tiny movements, called saccades, is it possible to get a full picture. So

most of what you think you see in front of you is just the brain guessing based upon what was previously seen.

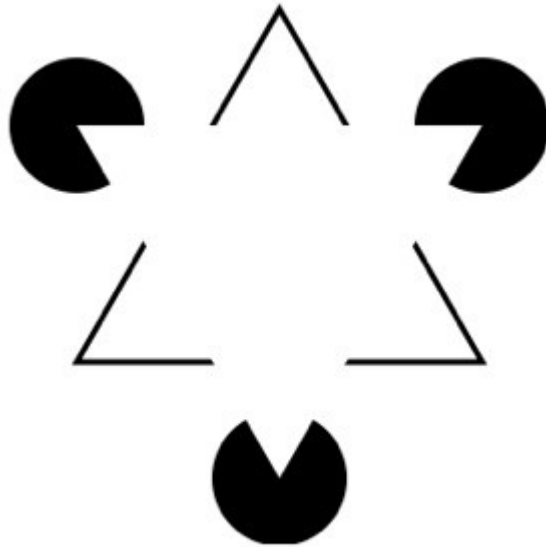
Visual illusions also demonstrate this quite nicely. The brain will simply make up things are are not there. Here are a few examples:



Notice the black spots between the squares?



A wave motion is created just because of the pattern.



This is perhaps the most important. A triangle shape is constructed merely from the outlines of the shapes in the image.

Movies rely on visual illusions a lot. Good films have the action built up around the editing. When you watch a movie—it is not something you think about—you fill in between the different shots. If you see a car come rushing by in one shot and in the next you see a damaged traffic sign flying through the air, you will assume the car hit the sign. Every time a new shot is shown you weave together the ones you have just seen and do your best to construct a narrative. Not only casual connections are made this way, but also more complex ones like the emotional state in character. The Kuleshov effect shows this effectively:



By having the same face juxtaposed against different scenes, different emotions are projected on the actor. All kinds of thoughts are imagined in the head of the character when seeing the imagery in sequence. It forces us to create our own mental narrative. It is almost impossible not to do so.

Most of the time, we do everything we can to make what we experience fit. This means that movies can often get away with inconsistencies of various kinds, because we are keen on wanting our reality to make sense. For instance, we almost never notice the length of cigarettes or water level in glasses changing between clips in a restaurant scenes. It can be taken even further; experiments have shown that most people will not notice when an actor is changed between cuts.

Complex systems can easily get out of hand, and in the end they do not help to increase immersion. We should instead try to use the player's imagination more. And this leads to the second and final axiom of the design approach:

Keep systems simple, and extend them using imagination.

Further Information

An interesting story of how the mind fills in blanks can be found in Oliver Sack's *The Mind's Eye* (2010). In a personal account of eye cancer, Sacks describes how he lost much of the visibility in his right eye. However, rather than have a black spot in the visual field when his left eye was closed, the brain filled out this empty space by guessing. Sacks tried to push the limits to see how far it would go. For instance, he found out that it could create the patterns of leaves on a tree, and it could even fill in animated imagery like ripples on water. Actually, the brain does a similar feat for all of us. Taking up a small bit of the visual field is the blind spot, a part of the eye that contains no receptors. The reason we do not notice this is because the brain fills out the space, and Sack's account is exactly the same, just over a larger area.

That we miss parts of a scenery during cuts is a part of a phenomena called change blindness. A good experiment of this is that if you show an image, then a black screen and then the first image with some change, it is very hard to determine what has changed. If the images were close to another, it would be much easier to see the change, because it was registered as movement. But when a black screen is in between, you need to rely on your detailed memory of the picture, something that you never had in the first place. This makes it quite hard to spot differences. Here is a [video](#) where you can try it yourself.

There is a nice talk by Chris Hecker that goes over similar things to what is found in this section. His focus is on human interaction and how it does not need to be perfect to have a profound effect. For instance, the hand-holding mechanic in *Ico* (Sony, 2001) is very simplistic in terms of inverse kinematics. Even so, it achieves what it intended and works great. There is no need to solve hard AI problems to move on, but very simplistic implementations do the trick as well. See more [here](#).

I cannot really mention "filling in the blanks" without bringing up Scott McCloud's excellent *Understanding Comics* (1993). In it he goes over the idea of closure, describing how much of a comic book really takes place in between the pictures. The book also goes through how the simplification of art into more symbol-like pictures can help evoke emotions, which also relates to this section.

Summary of Approach

The foundation for the new design approach is now complete. It consists of these two axioms:

- The main purpose of interaction is to create presence.
- Keep systems simple, and extend them using imagination.

This sounds strange and is quite different from what is usually thought about in game design. Can they work in practice at all?

We have actually tried this a bit in *Amnesia*, and we have had great success with it. Both the sanity systems and enemy AI are based around the notion of creating presence. Neither have any proper competitive elements and are also very simple systems.

The sanity system is a meter that keeps track of how many horrible events the player has been exposed to. It then shows all sort of visual effects, and it affects the game in various ways. At first this was done with a normal black box design and it was meant to be a challenge. However, since players ended up playing quite differently, the sanity system resulted in varied experiences, many that were engaging. Worse still, since the system was global and lasted the entire game, it was very hard to balance.

In the end, we simply skipped having any normal game elements to it and saw it as a mood feature instead. Our new design was that the system auto-balanced itself according to gameplay style. It was never really dangerous, apart from making the player slightly harder to control at times. This worked a lot better than before. The experience from players was lot better and more consistent. The system was also a lot easier to tweak.

The enemy AI had a similar evolution. It first started out as competitive, but then changed into more of an ambient feature. Enemies do their best to not be spotted by the player, but at the same time walk really close to her. This can create very tense situations that were not possible with what we started out with. Since the player does not see much of enemies—looking at them blurs the vision and decreases sanity and much of their movements are inferred—she imagines more depth than what is in the system.

There are also games that give up on the notion of competition and instantly make it possible to play themes in a way that black box designed games cannot. For instance, *Passage* (Rohrer, 2007) has you walking through a lifetime, *Dinner Date* (Stout Games, 2010) has you wait for a date to show up, and *Every Day the Same Dream* (Pedercini, 2009) is about being stuck at the same job.

I want to be clear that I do not think any of these are perfect examples of how to use this approach. But they have still managed to evoke strong emotions and show the breadth that opens up when you leave competitive design behind.

I also need to point out that this approach does not rely on the availability of advanced technology. It is not about making better AI, skin shading or inverse kinematics. It is all about art and design. We do not have to wait for any breakthroughs; it can be tried out right now.

It is important to know that I am not advocating some kind of return to *Dragon's Lair* (Cinematronics, 1983) type of games. That is, sequences of linear material where the player does simplistic quick-time events occasionally. I will present some more practical information which makes this more clear. But before that, there is an issue that needs to be dealt with.

Best Use of the Medium

There is bound to be some suspicion to the fundamental axioms of the design approach, especially the first one. It might seem like a waste to use something as fantastic as interaction only as a way to create presence. One can argue that this is not the strength of our medium, and thus not what we want to pursue when trying to evolve video game storytelling. But when you look at other media that does storytelling well, their obvious strengths are not used either.

First, consider film. When people first made motion pictures, it was in order to copy motions from the real world as exactly as possible. One of the very first usages of film was to see if a horse had all of its feet on the ground when trotting. The answer turned out to be yes, and it was discovered by filming it—exactly capturing the motion. Since then, film has been used to great success to capture various events in great detail. This is also its main scientific usage. It can record: behaviors of animals, a landscape's transformation over seasons or a bullet piercing an apple.

With this in mind, one might think that when doing storytelling in movies, the medium's obvious strength should be used—to capture a sequence in great detail. But that is not how it has evolved. As mentioned earlier almost all film is built upon some kind of editing, and much of the action happens in between the cuts. This is almost opposite the original and most obvious usage of film. No longer is the focus on replicating motions exactly, but instead on being ambiguous, not showing and letting the audience fill in the gaps.

Looking at literature a similar evolution is noticed. When writing was first discovered, it began as a way of keeping track of items. Lists could be made of how much people owed each other or people could write down events. Writing has also been a tool to preserve knowledge and a means to write down ideas as clearly as possible.

But in the storytelling medium, writing thrives on ambiguity. Writers try to keep details to a minimum and let readers fill in most of the information. Again, when used as a storytelling medium it goes counter to the original usage. Here are some examples of good storytelling:

"For sale: baby shoes, never worn."

- Ernest Hemingway

"A rose by any other name would smell as sweet."

- William Shakespeare

"The building was on fire, and it wasn't my fault."

- Jim Butcher

Important to note is that in both film and literature the original usage of the medium is still present, but it is not used as the main axiom on how to create good storytelling. This does not mean that the same should be true for games, but it certainly means that we should not dismiss it.

Another point to consider is that the feeling of immersion in a virtual world is one of the main reasons why many people play games. Having completed an area of the game, there is some satisfaction for having beaten it, but the main gain is the actual journey—the experience of having lived through this scenario. For many games, when one looks at fan art and generally reads about peoples' in-game experiences, there is a huge focus on the virtual worlds themselves and almost nothing on the abstract systems or challenges. One might argue that this feeling would not be the same without a focus on challenges, but having to beat the game is what makes it feel important and

real.

First of all, most victories in games are fake. It is not like climbing a mountain, because most challenges in games are set up in order for the player to complete them. There is never any uncertainty if an area can be passed or not. Games are tested and it is made sure that objectives can be completed if one simply tries hard enough.

There are also plenty of examples of games without any competitive edge that still evoke a strong sense of importance. *Journey* has been mentioned, and *Dear Esther* (thechineseroom, 2012) is another example. These games do present much of a challenge, but have still evoked powerful emotions in players. We have also had similar experience in *Amnesia* which people find really scary and tense, even though there is very little challenge involved.

I think that focusing more on creating this presence is something that many people want. It is also something that is very unique to games and might even be the most important storytelling device the medium has.

Now that we have discussed the best use of the medium, let us return to the new design approach. Given these two basic axioms, what does that tell us about designing games?

Further Information

Another interesting aspect when comparing to film and books is that both of these have a retrospective feature. When you watch a movie, the way you interpret an earlier shot will change when you view a later one. If you first see a facial expression and then see the motive, the motive will change your feelings towards that face. This is even more obvious in literature. When you start reading a book, the description of a character can be very vague. But as you later on learn more about the same character's appearance, you will think of the earlier scenes in a different light as you now have more information. Basically, you change your memory to fit the narrative. This hints that video game storytelling should perhaps have a similar aspect to it. The agreeable outcome that is discussed in the next section might be something to do that. But anything that works by having the player filling in the gaps could have a retrospective feature. If such an aspect really is needed, it is most certainly far from obvious. Still, it is at least interesting to keep in mind, and some kind of research into why both film and books use it might be enlightening.

Practical Usage

What now follows is some more practical advice. It will include techniques that we used in *Amnesia* and that we are using in our upcoming game.¹⁵ Think of this as a road map on how to start with this design approach.

Transparent Controls

In order to create a strong sense of presence it is imperative that the player feel like they have direct control over the avatar. In order for this to happen, there cannot be any focus on how the control is supposed to be working. The player should not think of how to make a certain input, but instead have a direct connection between her will and the avatar. Until this happens, a strong presence-maintaining loop cannot be created.

Simple controls are subjective though. For players who are used to first-person shooter (FPS) controls, these are really transparent, but if not they can be a bit of hassle at the start. However, a

¹⁵ Note that this game is not *A Machine for Pigs*!

general rule is that no matter the complexity, the player should know all the game's actions and be using these as early as possible.¹⁶ Every time new inputs are introduced, the focus is turned towards the control instead of making a connection with the game's character.

A great example of a game that does this well is *Limbo* (Playdead, 2010). All of the input required is introduced within the first few minutes, and the rest of the game is spent building up a connection with the avatar. Even so, the character's actions keep on changing throughout the game.

Constant Input

What made the rubber hand illusion disappear was that the stroking of the hand stopped. The feedback loop was broken and the body image returned to normal. What this tells us is that we need to be sure that the player is constantly engaged in the feedback loop and has as little downtime as possible. Once we have established a feeling of presence, we need to work hard at maintaining it, and making sure that there is a regular exchange of input-output is fundamental to that.

This regular input is also important for specific actions. For instance, instead of simply having the players press a button to move a lever, it is better if they mimic the activity by pulling a stick at the same time. Again, *Limbo* does this to great effect.

Agreeable Action Outcome

When an input is made the player must agree with the resulting output. This means that the output does not have to be exactly what the player intended or that the player had absolute knowledge of would happen. She just needs be able to weave whatever happened into a consistent narrative of her own experience.

Using this properly is important because if we want to keep transparent controls, we need have few and intuitive inputs. But at the same time, we want to have a wide range of possible actions. So being able to choose for the player without them knowing can become necessary, and I think it is essential to use this design approach as much as possible.

While this might sound strange, remember that our brains are wired for this. We want the world to make sense and do our best to keep it so. And this is not only in the input we get, but also our own intentions. Much of our feelings, desires and actions come from parts of us we have no access to; we constantly create explanations for we why behave and feel as we do. This kind of design is just a matter of taking advantage of that.

Assassins Creed (Ubisoft, 2007) has good and bad examples of this. A good example of this at work is when the avatar jumps over an obstacle when running at it. The player never specified this action, but she still totally agrees with it. A bad example is when the avatar tries to climb a wall when the player just wanted to walk up and inspect an object.

Heavy Rain (Sony, 2010) also has good and bad examples of this. Sometimes when performing an indicated action it is different than what the player expected. Other times, she feels it is exactly what she envisioned. However, the game might have played a trick on the player. Though what she felt in retrospect was exactly what she wanted to do, it might not have been what she wanted from the start. But the action was agreeable, so it gets incorporated into her personal narrative.

Deterministic Mechanics

One of the main reasons for mammals to evolve their intelligence was probably so they could

¹⁶ I just have to mention [this video](#) which covers this quite nicely!

predict more than their water-living ancestors. The ocean is a murky place and you cannot see very far, but on land it is possible to view large areas. This makes it possible for humans to have a much clearer picture of the situation, predict what will happen and make plans for the future.

Continuing this tradition, we need to make sure that the player is able to plan on a larger scale what they should be doing. In order keep a sense of presence, the game must evolve in a predictable fashion. Note that this is different from previous points that deal with short time-spans and direct causality; this is about moving forward in time and about sequences of events.

There are many bad examples of this. For instance, in a role-play game (RPG) the player might just want to inspect an item, but as she picks it up she is accused of stealing. This does not fit with the player's imagined vision of the world and breaks the illusion.

Heavy Rain also has a deal of this. In one scene the player has the option to look in a box or attend to a wounded man. If she decides to help the man first and look in the box later, then once she starts helping the avatar falls asleep. This spoils her plans. Outcomes like this make the player's sense of agency go down quite a bit, because she cannot not even make the simplest plan.

Hidden Actions

Having all actions available takes away from the feeling of being an agent in the story. The player will see the system much more clearly and it breaks immersion. For a feel of the issue, try the interactive fiction game *The Colder Light* (Ingold, 2012)¹⁷ which lists all possible verbs on screen. I think it really breaks the feel that other interactive fiction has,¹⁸ even though the actual space of interaction has not changed at all. Not knowing what one can do gives a larger sense of presence. I would think this is also true of games that have visible icons for interaction hot spots, versus those that do not. This depends, because if the player knows what she can interact with, she will not try and interact with objects that she cannot and avoids breaking the sense of a living world. So this means that hiding the actions trivially is not certain to increase presence, but showing all possibilities is not good either. Some kind of middle ground is probably needed.

No Repetition

There is no greater threat for exposing the underlying mechanics than having the game repeat itself. This come in two types, explicit and implicit. Both are problematic.

An explicit one is simply when a part of the game repeats itself in a way that gives the whole deal away. Humans are expert at recognizing patterns and we cannot help noticing these sort of things. An example of this is when you meet characters in RPGs that repeat the same line over and over. It is impossible to view these as thinking beings. Another explicit example is when the same section is repeated over and over without any meaningful changes. The player knows what to expect from these encounters and the fantasy of a living world goes away. Yet another example of this is the ventilation shafts in *Dead Space 2* (Electronic Arts, 2011); they are great the first time, but then become tedious, and it is hard to keep up role-playing.

Implicit repetition comes directly from black box design. It is any mechanic that forces the player to overcome a problem and blocks progress until she does so. The “die and repeat” design is a common example of this. What happens is that you basically force the player to see the underlying system, and this removes any imagined features she might have for it.

¹⁷ Get it [here](#).

¹⁸ If you have never played interactive fiction, this will not be that apparent.

Consistency

If the player is to be able to make a mental model of the world, it must be kept consistent. If the players cannot rely on their experience as base for a mental world model, they will have no choice but to look at design and mechanical aspects. Keeping consistency is crucial for success with this design approach.

We had many problems with this in *Amnesia*. We have physics for most objects, but for various reasons we made the same objects static at some points. For instance, a rock that could be picked up at one place was just part of background in another. This is quite a dissonance for the virtual world that players have built up in their minds.

Responsive World

Another way of making sure that the player builds up a mental model of the world is for it to be responsive. The more the player can learn about the world by interacting with it the better. This is also important for the storytelling aspects as cut-scenes should be used a minimum (hopefully never). All information needs to be exposed as the player interacts in the world.

This is also important because it might otherwise break the sense of a living world. For instance, if you throw a brick at a guard, the player will beforehand make a mental model of what will happen. Once that brick hits the guard, she needs to react in a manner that feels coherent with the player's model of the world. If it is impossible to have certain reactions, then it must be established beforehand and be part of the players mindset of what will happen in these situations.

Aesthetics Matter

With a simple system graphics, sound or whatever output you give the player plays a huge difference. A game cannot be made with this design approach using colored blocks since the system would be too easy to figure out. You need to have the proper output to hide your systems, and you need it to provoke an emotional response in the player. For instance, when making *Amnesia* a section could go from bad to great when the art and audio were improved, even though the systems remained the same.

Avoid Fail-Safes

Many games today are designed in such a way that no matter how you choose to play, it is still possible to complete the experience. This leads to many of the problems discussed. Clues are designed to be repeated, and players are boxed in by killing them off at the slightest wrong move. One might also be so afraid that the plot will not be followed that the player is drowned in cut-scenes.

I think that we need to ask more of players and give them greater responsibility. It might even be worthwhile to have specific instructions on how to play the game. The players will then know how to act in situations, instead of the game forcing them along a set line. Having the player learn rules might seem strange as it has been a foundation of most game design that you can get into the game by simply playing. Abandoning this might be another step in evolving storytelling.

For instance, in *Amnesia*, we started the game with a few directions such as “try and live the game instead of trying to beat it.” This seems to have worked to put players in the right frame of mind. It is probably also the reason why the non-competitive mechanics (AI and sanity) worked at all.

Local Activities

A lesson that we have learned over the years is to stop thinking in terms of puzzles or generic

challenges. Instead, we approach every scene by defining the activity the player will be carrying out. “Activity” is a less loaded word and makes one less prone to construct black box mechanics. We have found it better to have these activities local, making it much easier to figure out their boundaries and giving one a simpler overview of the player's possible paths. If your activity takes place in a too large of a space, then it will be much harder to keep in line with all the above rules. Note that this does not mean the game should consist of extremely simplistic tasks, or that you need to divide the game into levels. It just means that when you have an area where interactions take place, focus on what you are trying to achieve. Do not try to do hundreds of things, but limit your scope as much as possible.

There is No Silver Bullet

Now I will talk about final rule. This means that there are no easy solutions to implementing all this. In the classical black box design, you start out by making an engaging core mechanic and then have the entire game based around the player repeating that. That kind of thinking will not work with this approach. You cannot rely on the same basic gameplay to work for everything you want to do. In order to ground the game in a strong feedback loop, you still need some basic mechanics that are repeated throughout the game. But apart from this, you cannot rely on using some generic design over and over. In order to maintain a sense of presence and the illusion of a complex and living world, the game needs to be kept fresh and the player engaged. Common tricks like filling rooms with enemies in various configurations will no longer work. This puts pressure on making every area in the game count. Actually, embracing this thinking alone is bound to improve storytelling.

Further Information

The agreeable action outcome is probably one of the stranger suggestions in the list of rules found above. However, there are plenty of experiments to support this notion. In [one experiment](#) subjects were shown two photos and were asked to choose the one that they found the best looking. Having chosen, the experimenter took the photos back and returned a bigger version of the person they did not pick. When given the other picture, 80% of the subjects did not notice anything and proceeded to explain why they had chosen that picture, even though this was not what they chose. This is very close to the kind of effect that we want to recreate.

Another phenomena that is closely related to the agreeable action outcome, is misinterpretation of emotions. For instance, experiments have shown that when subjects meet a woman after having walked on a high and brittle-looking bridge, they are more likely to feel attracted to her than men who walked on a safe one. What happened is that the subjects interpreted the adrenaline in their body as arousal and thought it was due to the woman they were looking at. More info can be found [here](#).

There is even more on the agreeable action outcome to discuss. The creator of *Dinner Date*, Jeroen Stout, has written a very interesting [paper](#) that has this sort of design as one of its main focal points. It is well worth reading for another look at the problem.

Conclusion

I am not the first to complain about the lack of progress in video game storytelling. But there are very few suggestions on how to fix it. This is our attempt at just that. As with all new ideas, it is impossible to say if it will succeed, but we at Frictional Games will try and take this approach as far as possible and see what we get in result.

Thanks to

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