

Graphics: The Language of Interactive Storytelling

by
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The Death of a Dream

The idea is appealing. Create a computer program that not only tells a story, but that allows the user to determine the events and the outcome of the experience.

The reality is depressing. Despite myriad attempts, ever-burgeoning computational power, and the best minds in the business, we're nowhere near being able to program a storytelling machine. In fact, we may never be able to.

Why? Well, it turns out that interactivity¹ and authorially-controlled narratives are mutually exclusive, diluting each the other in equal measure². Worse, the very medium of expression which we use to relate and document narratives in all passive forms - language itself - cannot be reduced to a set of rules which can be computed by machines. All of which means the dream of creating interactive stories by wedding interactivity to narratives is dead.

Today we mark the burial.

Doubt and Determination

But wait.... How can interactive storytelling be an impossibility when so many people can clearly see the potential? Haven't we all played a computer game which affected us in a way that was different from anything we'd experienced in a passive medium? Didn't some of us become developers because of those moments?

The short and comforting answer is that we haven't been deluding ourselves. There *is* something to interactivity as a medium which is adaptable to a narrative experience. The problem is that it's not going to be the kind of narrative experience we had in mind.³

1 By interactivity I mean *real* interactivity, where user choice actually determines outcomes, as opposed to simply revealing predetermined events or scenes. It is axiomatic that the only way to create real interactivity is to use rules, because the outcome of rules-based choices can be computed. Unfortunately, critical aspects of storytelling including plotting, character development and dialogue are currently determined not by rule, but by editorial sensibility, which cannot be handled by a machine in a way that supports the user's suspension of disbelief.

2 Because of time and length constraints, and the very nature and complexity of the issues at hand, I am prevented in this article from supporting a number of the conclusions I have reached in the past five years of interactive theory and practice. Documents containing arguments in support of my conclusions can be found at Ditchwalk.com.

3 Unrelenting exposure to stories in passive mediums is the single biggest obstacle we face in trying to create an interactive narrative experience. From the time we're born we're peppered with stories in which our role is simply to witness, the result being that we're conditioned to view stories as both removed from us and determined by others. Getting past the idea of a story as a construct, and replacing it with the idea of a story as a personal journey, is critical to us not as users, but *as developers*.

In place of our dream of an infinite plot machine, and as a result of the fact that we may never develop believable human language interaction, we are going to have to come at the very idea of interactive storytelling from the opposite direction. Instead of starting with story, we must start with interactivity, and make *it* our foundation.

From the Ashes

Seen from this perspective, the narrative aspect of interactive storytelling will come not from predetermined elements, but from the actual *experiences* of the users. Unlike passive mediums, interactive storytelling is described not by the recitation of event triggers over time, but by decisions *made* over time, which can necessarily only be told in retrospect:

“I had him in my sights, but he jinked left and went into a cloud! I pulled up and rolled inverted, then suddenly caught a glint and saw him through a rent, banking left! When he came out the other side - I flamed him!”

Interactive stories are not scripted events in which the user is offered choices. Interactive stories are the sum of the actions taken in an environment pregnant with potential, regardless of whether those actions are ever related to another person. They are journeys, and personal ones at that - and still capable of powerful emotional effects.

The key to harnessing those effects is graphics.

A Picture is Worth a Thousand Words

Why does the switch in emphasis from focusing on narrative to focusing on interactivity demand that graphics step to the fore? The answer is that we need graphics because our first choice - interactivity based on spoken or written language - will not support suspension of disbelief when used as the method of interaction. Graphics, on the other hand, can meet this test.⁴

Although interactivity is our goal, the arbiter of which design elements actually are and are not interactive is consistency. Only by offering the user freedom to choose from *all* of the possible choices logically inferred by a given design element will the user become imaginatively involved. Because we know that a computer can't allow a user to ask any question they want at any time, language is rendered inconsistent as a design element.

In order to use language, developers must present to the user not true interactivity, but a limited subset of logically possible choices.⁵ Examples include branching dialogue trees in adventure games, which allow the user to choose from a small selection of possible

⁴ Sound engineers may be speaking up about now, and not without cause. Sound gets short shrift in many interactive works, which is unfortunate because sound is often more *emotionally* compelling than imagery. The point I am making about imagery is that we can use it as the foundation upon which to build our interactive works, not that it is sufficient for producing them. It is not.

⁵ Granted, genre conventions can disguise the inconsistency and allow for an entertaining experience - that is not in dispute. But our goal is not to simply entertain: we don't need interactivity to meet that standard. Our goal is involving the user emotionally through the medium and process of interactivity, and language simply cannot be used to that end.

questions or replies, and canned bits of in-game commentary which are regurgitated randomly, or after specific events. The aftertaste of such limitations is familiar to us all.

In contrast, consider the consistency inherent in a graphical environment. A graphical space can be explored with complete freedom: no limitations need be placed on the user as to where they can go and what they can see.⁶ For example, a level in a first-person shooter is finite and created by an individual who might be likened to an author, but the user's movement within the level is not scripted, or limited beyond the implied means of locomotion. Where the user cannot choose whatever sentence they would like to utter, they can choose whatever location they would like to visit.

Akin to techniques in passive works, we can also use imagery to portray meaningful symbols (weather, fire, animals, etc.), as well as character interactions (fighting, kissing) and states (happiness, sadness, anger, etc.), and we can do so using rules that the computer can interpret. And because we can do that, we can also get the computer to react to the user using those rules, providing outcomes determined by the user's choices.

Limiting the Limitations

Clearly, there are limitations inherent in abandoning language as a means of interaction and interactivity. But are they as daunting as they really seem? While it's true that language in the form of dialogue or authorial comment is quite often used to add emotional punch to a narrative event, it's equally true that language is often used to relate images or events - to another character, or to the audience - which in and of themselves involved no use of language. To the extent that we will have to give up the former, we will actually be removing an unnecessary layer of translation between the works we produce and the people who use them. No longer will authorial voices be needed to communicate the experience: now users will experience it themselves.

In addition, it's very easy to attribute a number of aspects of passive storytelling to language, when they are not actually language-based. While plotting and pacing present many problems, it does not necessarily follow that because we can't use language as the medium of interaction that we won't be able to have overarching plots or a compelling pace.

Consider as well that the great majority of all passive forms of entertainment that speak to us as art or entertainment have a visual component. To the extent that we're unable to use language, the most complex method of human interaction, in computerized entertainment, yes - it's a loss. But it's not a total loss. Not even close.⁷

⁶ Yes, there are practical limitations based on horsepower. Many games use a finite physical world simply because that's all the user's hardware will support, but this is not an inherent limitation of graphics. Given enough horsepower, we can create infinite spaces, but the same is not true of language interaction. We don't need more clock cycles to process language, we need rules, and we don't have them.

⁷ To some, losing language *will* be a total loss, and that's okay. Not everyone is cut out to work in the interactive mines, and if there can be disagreements about worth in passive forms, then the inability of some to appreciate or understand the merits and strengths of interactivity as an expressive medium can hardly be condemned.

The Language of Interaction

The language of imagery is going to be the language of our new storytelling medium. If it seems as if the commercial interactive industry is already headed in that direction, that's because it is. Computer game players have tasted the same fruit we've been smitten by, and they know what they want: choices which determine outcomes. The results of this demand can be clearly seen in a number of developments in computer gaming over the past five years.

- First-person point of view eliminates the need to translate game events through a separate character. The user doesn't have to wait to interpret game events through the in-game character's limited language capability, but can instead experience events themselves - through imagery.⁸
- Action games have become successful because they omit language interaction almost entirely, instead emphasizing conflict in virtual spaces - all of which can be determined by rules which can be computed.⁹
- The clamor for multiplayer in every genre is a direct result of the industry's failure to either deliver language interaction, sufficiently complex AI, or both.

Unfortunately, despite this natural drift toward image-driven experiences, we're still woefully lacking in our ability to deliver emotional involvement. Too often the experience is taking place on the monitor, not in the user's head, which is the direction in which we need to move. In pursuit of this goal it turns out that some graphical advances will yield substantial returns on investment, while others will yield little of use.

What We *Don't* Need

If we're striving for interactivity, through consistency, and we can't use language as the basis for that interactivity because it must always be predetermined in order to support suspension of disbelief, then pursuing graphical techniques which necessarily demand human orchestration is a similarly flawed approach. We are not establishing graphics as the language of interactivity simply to shift the role of impeding interactivity from storytellers to image-makers.

Again, our goal is delivering interactivity to the user. The following pursuits move us little closer to that goal.¹⁰

⁸ Even third-person in-game characters have been adapted to the limits of language interaction. In the past, in-game characters had more scripted commentary, while they now respond to events with gestures or postures. Again, the trend in design is away from the inherent limits of language, and towards visuals.

⁹ It's true that much of this rules-determined combat takes place in static, pre-designed environments which a developer created not by rules, but through sensibility. However, it's not *necessarily* the case that believable environments can't be generated by a set of rules - which is our frustrating problem with language. Moreover, it's not our objective to eliminate all hand-made aspects of interactive works. As long as the environments don't promise interactivity themselves - that is, they're the background or context for the interactivity the user is engaged in - there's no problem. (Pre-designed narrative elements can also be used in this way, as they are now, to frame the user's interactive experience. This framing, in turn, can heighten emotional involvement.)

¹⁰ Note: it's not wrong to pursue these avenues of interest. It's just wrong to say you're doing it because it will make interactive works better or more emotionally involving.

Realism

The pursuit of photorealistic computer graphics has little to do with the creation of interactive works which are emotionally involving. Worse, not only is there no real correlation between how realistic an image or object looks, and how compelling the viewer believes it to be, but photorealism can also work to our disadvantage.

If we're trying to create a consistent world in which the user can become imaginatively involved, it makes sense that using imagery which is not directly equivalent to that in everyday life would be of help, simply because the user would have fewer external referents clouding their mind. On a practical level, hardware limitations will keep photorealism from being implemented consistently for a considerable time, which should be sufficient reason to look elsewhere.

Inconsistency

We're gravitating to images as a language because we can't generate real interactivity from our spoken and written forms of communication. It makes little sense, then, to turn around and allow authorially-determined inconsistencies to have the same negative effect on the user's imaginative involvement.

Every work has its own look and feel, and it's important to make sure those identifiable traits are handled consistently. Obviously anything failing to live up to the standard set forth will draw attention to itself, and need to be fixed. What isn't so obvious is that the same thing is true of aspects that are overly-grand, calling attention to themselves by the very nature of their superiority.¹¹

Special Effects

Quite often special effects are registered by the user as impressive detail, which is just what we don't want: the world should be seamless to the user, and the effects displayed organic to the place. Unfortunately, special effects often seduce individuals into elevating their contribution over the whole of that work, either through vanity, genuine intellectual interest, or both.

In no case is this beneficial to our goal. Individuals contributing to imagery - whether 3D engine programmers or graphic artists - must subordinate their skills to the whole of the work at every opportunity.

Hardware Adoration

What we create now, and what we will be able to create in the future, is in important ways determined by what the hardware will support. This does not mean, however, that all hardware features are equally important to our goal of creating emotional involvement for the user.

Like special effects, hardware capabilities are interesting to the people who are

¹¹ Of the same disconnect in literature it's often said that you must "kill all your darlings." Meaning anything that stands out must be excised, including aspects which are apparent because they are too good.

charged with creating them and using them as tools, but they may be of secondary or lesser importance to the user. Hardware capability should not lead our pursuit.

Dominating the CPU

The call to make graphics the language of interactivity should not be construed as a license to dominate whatever processing power is available. Sound and AI are going to be just as important in creating the final effect on the user, so we should always emphasize clean, tight and *controlled* implementations.

Tools for Interactive Storytelling

Whether immediately attainable or not, the following areas of interest will expand the vocabulary of graphics-based interactive techniques, or hone them to a finer edge. Advances in these areas can only enhance the quality and impact of the user's experience.

Consistency

No surprise here, but let's follow the thread for a moment. The cornerstone of consistency in a graphical environment is freedom of movement, which *is* interaction. It follows that the more we can provide consistent spatial interaction, the greater the user's sense of place will be, which will in turn have a positive effect on the user's imaginative involvement.

One of the simplest examples of how this can be done is by introducing rules-determined weather and time of day into an environment. Not only do these additions convey a greater sense of place, but they have deep symbolic meaning as well, which is a real aid in helping us create what the user will remember in retrospect as *their* story.

Also, because these elements of place are rules-determined, we as developers can transparently link them to actions that the user might take, in order to add to the mood or feel of the moment. For example, when a user defeats a foe after a very tough battle against overwhelming odds, we could cause a gap to appear in a layer of overcast, bathing a distant vista in sunlight.

Aspects of a graphical environment which we can depict consistently, and determine by rule, are fertile tools for designers seeking to provide users with powerful emotional choices, and powerful effects resulting from those choices.

Plasticity

However simple the graphical environment we're creating, the design possibilities grow exponentially if the environment can be changed by the user. Not only might a rocket slamming into a wall do visible damage, or bombs falling to earth leave a crater, but the user could also be given the ability to cut marks in a tree, or scratch signs on rocks. Because of the way in which plasticity deepens the user's sense of involvement in a virtual space, any way in which we can let the user affect the world they're inhabiting should be viewed as a positive

The ideal implementation of plasticity, as with spatial attributes, is the use of plasticity as a design element, such that it impacts the user's decisions and changes the world they are exploring. A simple example is the ability to bash down doors in an RPG, if the user's character has the requisite strength or tools. Care needs to be taken, however, to make sure that plasticity is consistent. If some doors can be broken down, but other similar doors remain unaffected, the inconsistency will shatter suspension of disbelief.

Persistence

A corollary to plasticity, persistence etches the user's experience into the world itself. By making changes in the world persistent where it would be logically consistent, graphics reinforce the user's sense of participation, place, and relevance.

Without persistence, the creation of basic narrative and emotional constructs - the experience of tragedy, for example - is almost impossible. By supporting persistence graphically, the user is able to, *and forced to*, confront the meaning of their presence in the world they're inhabiting. Both the outcomes and long-term effects of choices the user makes become part of the fabric of the user's experience, reinforcing emotional and imaginative ties.

Scalability

The ability to view from near and far with no indication of transitions in level of detail, and no degradation of image quality, will go a long way toward supporting suspension of disbelief. The ability to discover more in an image upon closer examination will add enjoyment, and can also be used as a design element.

Complexity

By overloading the user's ability to understand the rules which drive the environments they're interacting with, we can compel them to believe in the space as long as we maintain consistency. For example, combining weather effects with changes in plants states, plant types, water levels, soil condition, and animal activity, could all be done by rule, and could all be related to the user graphically, so that they would know changes were taking place. The fact that they could not perceive the rules defining those changes, but could only perceive cause and effect, would make the world seem alive.

Organic Detail

Saying that we don't want inconsistency and that we prefer images which are derived from computable rules does not mean we should eschew detail. Any organic detail that we can add is to the good, provided it doesn't impinge on other aspects of the design. In a flight sim, clouds are a good example of organic detail, and in flight sims which do not make use of radar clouds become an aspect of gameplay.

Character Interaction

While we may not be able to get actual character-to-character speech, that doesn't mean we can't model and depict emotions between life forms, or even machines. The majority of users enter virtual worlds predisposed to sympathize and empathize, and we must give them ways to do that which do not involve five-minute cutscenes about how an evil wizard caused someone harm.

Having a foe become enraged at the death of a comrade - and seeing that rage in the face of the foe - would add real depth to the environments we're trying to create. Having a life-form shed a tear at the death of a comrade would carry similar weight.

The Power of Restraint

It is the nature of the beast that no matter how much time we have to complete a project, we're not going to be able to do everything we can or want to do. Deadlines, budget pressures and the risks inherent in the unstable platform we create for (including consoles) all demand that product be pushed out the door.

The effect of this practical limitation on our ability to create compelling works using the language of graphics is that we must exercise control and restraint from the outset. The sad truth is that we are, and always will be, trying to develop imagery as an interactive language in an environment which does not support such initiatives. Editorial sensibility and managerial efficiency, will, for any given project, produce as many gains for the user as will theoretical or applied technical advances.

Keeping the End in Sight

The solution to the dilemma of limited resources in an immature medium is the adoption of a palette of techniques optimal for a given genre, and the application of those techniques within a house style particular to your development group. Just as Disney and Warner Bros. animations are vastly different, yet both effective, so too can individual developers emphasize a specific approach within a spectrum of possibilities.

At all times, however, it is important to keep the user's experience in the forefront of development, because there is simply nothing more important. Users are not demanding photorealism, and they are not demanding the latest and greatest effects in each work. What they want, more than anything, is to care about the places they are exploring, and to feel as if their presence has an effect on that environment.

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