

Active Storytelling

Andrew Glassner

Microsoft Research, USA

EXTENDED ABSTRACT

Introduction

People love to exchange stories. Stories provide a context for the events, feelings, ideas, and relationships that make up the fabric of our daily lives. When we describe an important experience in our life to another person, we often shape it in the form of a story. Stories are a means of communication.

We are on the threshold of a revolutionary change in how people will communicate with each other and the environment. A global wireless communications network, coupled with computational devices that know where they are and are in contact with the network, will knit together individuals and groups in ways we have never seen before. These devices will employ speech recognition and synthesis, algorithms for vision understanding and graphic synthesis, and algorithms to extract meaning from text, images, and sounds. When these devices mature, they will be small, portable, wireless, and ubiquitous. They will have a deep impact on our cultures, and our stories.

These technologies will not eliminate other, more traditional media, just as television did not eliminate film, and film did not eliminate novels. But they will open the door to new kinds of stories that can be told in new ways. Because these new approaches will rely heavily on underlying technologies, it is exciting to try to anticipate new ways of storytelling, in the hope that we can influence the development and engineering of those technologies to keep the doors of possibility and exploration wide open.

The Technological Promise

As software and hardware improves, we will reach a point where a person can enter a highly detailed, impeccably simulated immersive environment. Eventually, we will communicate with computers via direct cortical stimulation and sensing, but until that day there will be a series of increasingly non-intrusive and higher-resolution display and sensing mechanisms. Whatever the hardware, the sights and sounds presented to the person will be a quality indistin-

guishable from natural vision. Ultimately, haptic feedback will join that list. Dynamically-generated taste and smell appear to me to be unlikely in the near future.

This synthetic world will be populated with autonomous, simulated people that look, sound, and act in ways that are indistinguishable from other, real people sharing the space. A real person can hold conversations with these simulated characters, carry out plans with them, and treat them as completely first-class citizens on a par with other real people. The fact that the character is synthetic may be immediately obvious on first meeting, always left ambiguous, or only revealed under certain circumstances.

A more sophisticated class of character is the procedural hybrid, which is a synthetic character that is based on a real person, who periodically takes over direct or indirect control of the presented character. Again, determining if or when a character is being directed by a real person, and to what extent, will depend on the nature of the environment and the desires of the people involved in it.

The Story Contract

Authors are constantly seeking new ways to express themselves and capture audiences, and audiences are seeking works that move or entertain them. Authors have constantly experimented with the structure of stories, and audiences have proven more receptive to some experiments than to others.

When we think of what new forms of fiction will arise in the next few years, there is value in knowing how much of the past we want to keep. I think we can find some guidelines by viewing modern fiction as the current state of an ongoing evolutionary process.

The traditional Darwinian model known as phyletic gradualism states that evolution advances by favoring for reproduction one or another minor variation from a large pool of candidates. Over a great period of time the best traits are reinforced and survive, leading to an accumulation of traits

that lead to a successful organism². I assert that artists, authors, playwrights, and even six-year-olds all have a pressing need to find the best ways to tell their stories, and often experiment with form and structure to find those ways. This seems to parallel natural selection; the traits of stories that we see today are by definition the traits that have worked best in the past, and are working the best today. They are the fittest, or best, story structures for here and now.

Of course, radical change may always be around the corner. A more recent evolutionary theory known as punctuated equilibrium asserts that actually most of the time populations are in a period of minor development or even stasis, broken only infrequently by short bursts of radical change¹. This theory presents a natural way to understand how new media change fiction.

For example, consider motion pictures. The technology for publicly showing a motion picture was first used in December 1895. Eight years later, Edwin Porter made "The Great Train Robbery" for the Edison company; this was arguably the first dramatic motion picture. In 1915, D.W. Griffith's film "The Birth of A Nation" was released - this is widely regarded as the first great motion picture³, and established film as a serious artistic medium.

In the years since then we have seen many technical improvements, such as better cameras and projectors, color film, soundtracks, and digital effects. But these refinements, though they have greatly expanded the palette available to the filmmaker, have not changed the essential characteristics of the motion picture form. We could argue that in only twenty years the story species called film found its niche, and the basic form has remained stable since then.

Working with this analogy, we can look back over the structure of stories in different media and ask what features, if any, they share in common. The features that I have found to be important can be summarized in terms of a relationship between the author and the audience which I call the story contract. By "author" I mean the creator of the work, whether it is one person or a collaborative team. By "audience" I mean those who are not primarily charged with the design and creation of the work, but have come to the work to be engaged by it and in it. I think that there will be some blurring of these roles over time, but the general categories will remain.

In the story contract, the author and audience both have certain responsibilities. If either party fails to fulfill its roles, the work fails, because the communication between the two parties breaks down. An author has two essential responsibilities.

The author's first responsibility is for the integrity of the psychology of the lead characters, and the actions those characters take as a result. These actions include internal mental decisions, conversations with other characters, and physical actions in the world.

By making these the author's responsibility, it is clear that the audience must never explicitly step into the shoes of one of the lead characters and make decisions on their behalf.

One reason for this prohibition is that such a decision will likely not be the result of an integrated personality. We are all bundles of contradictions, but we are also consistent in some important ways - otherwise we would never be able to sustain relationships with other people. It is the work of the storyteller to build and maintain the empathic connection between audience and characters by creating and maintaining an interesting and appealing - though not necessarily likable - character that behaves in a rational, roughly consistent manner.

The author's second responsibility is for the sequence of plot events that involve those characters. Some of these events may simply befall the character (e.g. an earthquake), and some may be a direct or indirect result of the character's prior actions. Plot sequencing is vital because it moves the story in the right direction: towards increasing conflict, tension, and risk. It also reveals the personalities of the characters in a controlled way: actions advance the plot, but they also reveal character. In many fictional works, the climax involves the lead character making a difficult and risky choice. If that choice is made at the start of the work, then the work is structurally damaged from the outset.

The audience's side of the contract has only one element, but it is a daunting one. An audience member has the responsibility to grant the author the freedom to manipulate him or her intellectually, emotionally, and spiritually. This is actually quite remarkable - most people are wary of being manipulated or controlled, and are rarely willing to let someone else tell them what to think and feel. But the moment the novel is opened or the curtain goes up, that is precisely what audiences do. There is a certain safety in the process, because the audience is in control and can always mediate, reduce, or sever the connection. Experiencing the flow of emotions inherent in a story is one of the reasons for engaging in a work of fiction in the first place. The feelings may be vicarious, but if the audience member isn't along for the ride, the experience is a shallow one.

The popular notion of the required "willing suspension of disbelief" is part of the audience's responsibility, but refers only to the intellectual component. The audience must also grant emotional (and even spiritual) control to the author, or the piece won't work. An audience engages into a story primarily by emotional identification with one or more of the characters. The audience must be willing to give the author the opportunity to build those emotional ties and then yank them around. If a story is meant to move an audience emotionally, to make them laugh, or cry, or be worried or proud or ashamed, the audience members must grant the author the power to move them - that is, emotionally manipulate them. Some stories also work on a spiritual level, where the stakes are higher but the principle is the same.

The story contract is very simple - it only has three clauses, two for the author and one for the audience. But as an analysis tool it provides a way of understanding why some story variations work and others fail, and I believe can guide us in developing new story structures.

Active Storytelling

I believe that with time, computer systems will be able to carry out most production skills such as cinematography and lighting automatically, in a tasteful and competent manner (whether computers will ever be inspired is another question). I also believe that creative professionals will always find ways to push the boundaries of these fields and assert their individuality and imagination. But there will come a day when most of jobs of production could be handed to a computer, and the results will be acceptable. Already we are seeing some mainstream commercial products that dynamically handle lighting and cinematography⁴. Admittedly these are simple games, and the simulators are crude, but I think it's reasonable to expect the quality to improve to a professional level with time.

I believe that computers will eventually pass what I call the Video Turing Test. In this test, the computer plays the role of a person on one end of a video telephone call, conversing with a human judge. The video image will be created synthetically with real-time computer graphics, the voice will be the result of vocal synthesis, and the conversation itself will be the result of a combination of natural language understanding and synthesis, real-world knowledge, and a personality program. In a successful test, the judge will be unable to reliably distinguish whether the person he or she is speaking to is a person or a computer. The mechanics of getting to a Video Turing-compatible computer simulation are formidable, and it will take some time, but that time will come.

When procedural environments are rich enough to contain simulations not only of physical objects but also thinking and feeling characters, we open the door to a new form of fictive structure.

In active storytelling, the author creates not only the structure of a story, but also the cultural and physical climate in which the story takes place. The author is responsible for creating the characters, the essential plot events, and the world of the story. The computer brings these all to life in a fully simulated, visually and sonically rich synthetic environment. And the audience joins into that immersive environment, participating or observing, influencing or just watching, and dealing with the other people and characters and events as scripted by the writer and interpreted by the computer and other audience members.

The basic idea is that the author creates the story and a place for it to unfold. Using very high-level tools, the author specifies the characters and the action, and lets the computer fill in any details required by the audience as the story is told. In addition to the general tools, the author can provide additional, important details that completely specify characters, objects, and plot developments. The audience can be a single person, or many people involved simultaneously.

This vision is similar in spirit to many avatar-based systems that have been built recently. Where it differs is in its use of the story contract to assign a few specific responsibilities

to the author and audience. Thus such a system has a lot in common with traditional forms of fiction.

The Audience as Participant

Participants in this environment can participate in many ways. If they choose to engage actively, they can take on the role of a character. An author may present a set of pre-constructed characters, which an audience member can adopt wholesale, or modify as desired within limits set by the author.

Each character has a built-in set of actions, movement, and personal behaviors. A participant can accept them as-is, delete them all, or accept some and replace others with personal design. For example, suppose that an audience member named Paul has taken on the character of a pirate. This pirate has a visual tic that causes him to wince in one eye every few seconds. The character that other audience members see and interact with will possess that tic, whether or not Paul actually winces his own eyes. If Paul is wearing a sweater and slacks, he could still appear in traditional pirate's costume in the environment. The pirate may have Paul's face, or a completely different face, or a face somewhere between the two. When Paul is not keen to exert much energy, the character can sustain itself according to a combination of Paul's personality and the one built into the pirate. But Paul can override the character's actions any time, add new ones, delete old ones, and take over the character. Normally the pirate's facial expressions will directly track Paul's own. But Paul can also "map" his actions. For example, when Paul scratches his head, his character scratches his head. But if Paul hiccups, his character combs his hair. Not all of Paul's real actions are echoed, and some are replaced by other actions. If his pirate limps, then when he moves from place to place he limps, favors one leg when stepping over things, and so on, even when Paul is sitting in his chair.

To help stay in character, participants don't have to say everything just as they would in the scene (though of course they may if they wish). Suppose Paul is in his pirate environment, and someone picks up his favorite ivory sculpture and threatens to throw it overboard. At home, Paul might shout, "Put that down!" The system hears the exclamation, and translates this appropriately, so his character shouts, "Drop that egg, ye scurvy dog, or I'll slice y'er ears off!" Of course, Paul can select whether he wants a lot of this translation, only some, or none. A nice side-effect of this (when it fully matures) is automatic translation, so each participant hears all the other characters speaking in his or her native language.

Finally, audience members and story characters share first-class status in this environment. The characters have their own agendas, but so do most of the other members of the audience. The audience can participate in the story, wander through the environment, and even engage and distract the characters as well as other audience members. But eventually the plot points set by the writer, and the internal psycho-

logical needs of the characters, will drive the story forward, pulling the audience along with the flow.

An interesting opportunity is to create stories with a collective protagonist (and a collective antagonist as well, of course). The role of the story's hero can be taken up by an ensemble, each of whom has his or her own goals, as well as a shared goal for the group. One or more other groups share the environment, each with their own agenda. Each group will naturally see itself as the protagonist and the others as antagonists. The author may choose to actually select one group for this role, or leave it unclear. Typically the goals of the characters in each group will sometimes be cooperative, and sometimes contradictory. Similarly, the goals of the antagonists will be in opposition to the goals of the protagonists. This idea has some similarities to the small collaborative groups posited for procedural fiction⁵.

This model is very similar to how political and economic groups operate today: citizens of countries often fight within themselves, but unite when attacked. Similarly, many corporations and other institutions house serious in-fighting, but often the conflicts are based on different ways of achieving a shared goal. The collective protagonist seeks its goal, while each individual follows his or her own course.

Acknowledgements

For discussions and suggestions, I thank Jim Kajiya, Curtis Wong, Matt Conway, Dan Robbins, and Maarten van Dantzich.

Web page and email of the author

Web: <http://research.microsoft.com/glassner/>

Email: glassner@microsoft.com

References

1. N. Eldredge, N. and S.J. Gould. Punctuated Equilibria: An Alternative to Phyletic Gradualism. In *Models in Paleobiology*, T.J.M. Schopf, ed. San Francisco. Cooper & Co., 1972.
2. G.G. Simpson, *The Major Features of Evolution*. Touchstone, 1953.
3. James Monaco, *How to Read A Film*, Oxford University Press, 1981.
4. Shigeru Miyamoto et al., *The Legend of Zelda: Ocarina of Time*, English version, Nintendo of America, Inc., 1998.
5. Janet Murray, *Hamlet on the Holodeck*, 1998.