1 Introduction

God created man because He loves stories.
- Elie Wiesel, from Souls on Fire: Portraits of Hasidic Masters

1.1 Thesis Statement

Media entertainment technology is rapidly evolving. From radio to broadcast television to cable television, from photographs to motion picture film to digital video disks, as the media evolves, so do the stories told through the media. We already share many more stories and more types of stories from many more sources than we did a decade ago. This is due in part to the development of computer technology, the globalization of computer networks, and the emerging new medium which is an amalgam of television and the internet. The storyteller will need to invent new creative processes and work with new tools which support this new medium, this new narrative form. I propose a name for this new narrative form—the *metalinear narrative*. The metalinear narrative is a collection of small related story pieces designed to be arranged in many different ways, to tell many different linear stories from different points of view, with the aid of a story engine which sequences the story pieces. My thesis is that a writing tool which offers the author knowledgeable feedback about narrative construction and context during the creative process is essential to the task of creating metalinear narratives of significant dimension.

1.2 Summaries

1.2.1 Context Summary

One of the challenges of writing stories in the last years of the twentieth century is the writer's awareness of the ever-widening diversity of characters and viewpoints which reflect our increasingly global perspective. The effort to include these multiple perspectives makes it very hard to maintain story coherency. The challenge becomes more difficult as we proceed through an information age where we know more intimate details than ever before about the cities, towns, and countries of our planet through the nearly ubiquitous media.

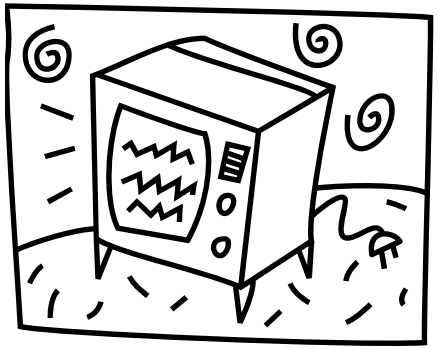

Fig. 1 Through television and a variety of other media, we now see more of the world than we ever have.

In the 1980's, significant historical events in China and Germany appeared in North American living rooms. During the Gulf War in 1991, events in New York, Washington DC, and the allied base in Saudi Arabia were shown by CNN in Baghdad. While the bombs fell in Baghdad, the world tuned in and watched. Perhaps for the first time in history, a military commander could gain valuable political if not military strategic information simply by watching TV.

The growth of the internet has accelerated our awareness of multiple cultures and made it easier for us to come into contact with one another. During the 1995 succession referendum vote in Quebec, Canada, anyone using a web browser could view an up-to-the minute tally of an extremely close political race upon which the future of a nation depended. Using personal computers and the internet, millions of people worldwide place themselves in countless special interest e-mail groups and share their personal narratives through tens of thousands of newsgroup bulletin boards. We can electronically label and

identify ourselves as having important similarities with people who are geographically and culturally distant. We are more aware of who we are globally and, therefore, simultaneously see ourselves as parts of our local subcultures and also as parts of larger global units. We are not as easily represented by a single leader's voice anymore, but instead recognize the multitude of our individual voices.

Fig. 2 Our writing needs a way of including more of the diversity of voices around us.

1.2.2 Problem Summary

Though we now see and experience the world as a much more diverse place, this worldview is difficult to represent in narrative. While there is more to know and more things possible to include, writing a traditional linear story is largely an exercise in editing out. In a world with so many different faces, how can the writing process and writing product include more voices?

While the computer can accommodate many voices through its massive digital storage and search capabilities, it cannot automatically make sense of those voices. This is the job of the author. Yet how does the author, trained to see uni-linear stories, shape these many narratives elements into a coherent form? Through the use of intelligent tools. There are already people using computers to author multimedia stories which incorporate multiple points of view. Projects from the Interactive Cinema Group such as It was a Knowledge War (Houbart, 1994), as well as the Apple Computer's Guides project (Oren, Salomon, Kreitman, & Don, 1990), are examples of multimedia projects which, among other things, incorporate multiple points of view around central issues. Other developers use what could be called a plot-based approach to authoring multimedia stories. Instead of focusing on characters and point of view, the author focuses on plot, and structures the story as an interconnected branching network of plot lines. The interactive laserdisc nar-

ratives of the 1980's used this method. But while these projects concentrate on the end-user experience, they do not recognize or facilitate the author's task. In the case of the plot-based approach, how does the author overcome the seemingly intractable problem of exploding combinatorics? (Bruckman, 1990 #23) And how is the author to make sense of a multitude of viewpoints? By not creating a single linear narrative, but by creating a meta-linear narrative.

1.2.3 Solution Summary

The *metalinear narrative* is a narrative form which addresses the problem of authoring and presenting multiple stories from multiple points of view. It provides the author with a web-like structure for storing story parts, from which many linear stories can be constructed. The metalinear narrative form is a collection of small story pieces stored in a semantic network and designed to be sequenced and arranged in many different ways, to tell many different linear stories.

The prefix *meta* comes from the Greek, meaning *above, beyond, transcending*—a higher state of development. Metalinear narrative, therefore, defines a form which transcends the typically linear sequential form of narrative in favor of an interconnected structure of small narrative pieces that can take on many different linear forms. To attain the multiple linear forms, metalinear narrative includes an integration of structural tools used in the linear construction process. These tools include an abstract story framework which describes a general linear form without specifying story content and a set of links for connecting story pieces together such that they are each defined through their similarity to other story pieces. An æsthetic choice for metalinear narrative is the narrative style of multiple first-person points of view. There is a strong fit between this style of relaying a set

of events through the eyes of many characters in the first-person and the technical structures of linking story pieces together in different ways. While there is no doubt that there are other narrative styles which work with metalinear narrative, the multiple point of view style is an obvious fit. An example will clarify this.

The fairy tale Little Red Riding Hood spans at least three centuries and is a common folktale told throughout European cultures. One of this tale's best known published versions is that by the Brothers Grimm (Zipes, 1987). In the Grimm's version<sidenumber>1, Little Red Riding Hood is a young innocent girl sent by her mother on an errand of mercy through the woods to bring food to her grandmother. She is instructed not to deviate from the path because the woods are a dangerous place full of nefarious wolves. When Little Red does leave the path, she catches the attention of the Big Bad Wolf, he ascertains her destination, runs ahead of her by taking a shortcut through the woods, beats her to Grandmother's cottage, eats the grandmother, lures Red into her grandmother's bed with him and eventually eats Red as well.

A metalinear version of this tale would first take into account the many possible character points of view: the mother who no longer wants to deal with her own aging, annoying mother and so decides to send her young daughter on a journey she herself should probably take; the wolf who is simply hungry and will do whatever it takes to survive; the grandmother who would like a visit from her estranged daughter but will instead take a visit from just about anybody; and the little girl who knows that the most important things in life are to be polite and to mind one's elders. It is not just the animate objects that can have a voice, but the inanimate objects as well. The forest which houses the wolf, watches the little girl walk off its path and separates the mother from the grandmother

1 There is evidence of the Little Red Riding Hood story existing in the oral tradition as far back as the 11th century. In the 17th century, the French writer and folklorist Charles Perrault published the popular folk tale as "Little Red Riding Hood". The Grimm's version of this story, published in the early 19th century, is actually entitled "Little Red Cap." Through the centuries it was Perrault's title that stuck.
(Bettelheim, 1976)

can also have a point of view. To the forest, predator and prey are a way of life, and little girls who wander off paths and talk to strangers become prey. The basket of goodies, which was woven in the traditional style and passed down from matriarch to matriarch for many generations, can have a voice which expresses its disgust over the familial rift. The red riding hood itself, a garment made by the grandmother's own hands, can whisper into the little girl's ear—the soft voice of conscience ultimately ignored. The parade of possible character points of view can be quite long and exciting to work with. Each of the characters would express their own view of the story events. By grouping their expressions into small granules and tying those granules together through links which define them in pairs of agreeing, disagreeing, preceding, and imperative to one another, a network of story stepping stones is formed. The previous links give guidance as to which one would be appropriate to go to next.

Fig. 3 Little Red Riding Hood in bed with the wolf, by Gustave Doré.

Another powerful part of metalinear narrative is that many different versions of a character's point of view can be included in the same metalinear structure. A metalinear Little Red Riding Hood could include Little Red introducing herself in very different ways:

1) I live on the edge of a large dark wood in a small cottage with my mother.
2) My mother and I live alone a long way from my grandmother whom I never get to see anymore.
3) All I get to do is play in my front yard behind the gate. I never get to do anything exciting.
4) Today I turned thirteen years old. Why am I wasting my life away in this stupid cottage with my snippy mother? I'm all grown up now and I can do what I want.

By intelligently weaving together an array of character worldviews and accounts, different linear stories can be constructed. The intelligence comes partly from the man-

ner in which the writer links story granules, as well as from an abstract narrative structure. For example, one way to tell the above metalinear fairy tale is to have characters introduce themselves, talk a bit about the world they live in (the domicile, their neighborhood, etc.), have them describe a problem in their life, then have them talk about that problem's solution. The wolf could politely introduce himself, tell us about his struggles for survival in the cold and dark woods, how he was recently very hungry, but then how he eventually solved that problem. On the other hand, the mother could introduce herself, talk about eking out a life in a drafty cottage in dire need of repair, having to find some way of supporting her daughter while also supporting her own ungrateful mother who lives far away, and then talking about a very recent solution she realized would work well now that her daughter is maturing. The same structure could also be applied to a story which tells the parallel tales of the wolf and the mother together – two tales of survival which oddly agree with one another.

The rearrangement of the story pieces, such as those above, in a metalinear narrative is done with the aid of a story engine. A story engine is a set of software algorithms designed to make appropriate decisions regarding the sequencing of story pieces for a computer-based story. My project demonstrating this metalinear solution is called *Agent Stories*.

Agent Stories is a software tool consisting of a set of environments for authoring pieces of stories, authoring the relationships between the many story pieces, and for designing an abstract narrative structure for sequencing those pieces. Agent Stories also provides a set of software agents called *story agents*, which act as the drivers of the story engine. While not story engines themselves, a story agent's unique parameter values determine how the

story engine operates. Story agents select and sequence the story pieces, according to (a) a user specified abstract narrative structure, (b) the relationships between the story pieces, and (c) the unique parameter values of the story agents. The system supports the writer thinking about and structuring a metalinear story by assembling simple narrative constructs during the rewrite process. Agent Stories is primarily intended for an author's use in the creation of metalinear multiple point of view textual stories, before the stories are realized as multimedia presentations using video, audio, and still pictures.

It is difficult to write a metalinear narrative, largely because it is difficult to break the deeply learned habits of linear narrative thinking. While the human brain is the most versatile tool for the job, it is difficult enough keeping all the narrative structures and details in one's head when the narrative is small and simple. When the narrative is large, I maintain that the task is nearly impossible to accomplish without external tools. This is why a writing tool which can store the story details in a meaningful way and which offers knowledgeable feedback about narrative construction and context during the creative process is essential to the task of creating metalinear narratives of significant dimension. My hypothesis is that with the appropriate tool, writers can successfully write in a form which departs from the strict single linear narrative, in favor of a form which will allow multiple reconstruction into many different linear narratives. This hypothesis will be proven through the use of the software tool Agent Stories and an analysis of metalinear stories created with this tool by selected writers.

1.2.4 Overview of the Dissertation

The remainder of this dissertation will proceed as follows:

Chapter 2 defines the term metalinear in more detail, discusses various story forms, and the notion of building different whole stories from parts. Included will be examples from traditional media like books and movies, a section on narrative granularity, and a section on story structures used to construct narrative granules into whole stories.

Chapter 3 includes a more detailed discussion of the Agent Stories problem domain through examples of work done by others. The domain involves problems relating to the representation of story knowledge, character and agent focused approaches, the puzzle approach and others. The chapter includes a discussion of where these approaches fall short, and where metalinear story systems and the Agent Stories software contribute to the field.

Chapter 4 is the complete discussion of the Agent Stories software, all of its parts and how they each work.

Chapter 5 describes the authoring process with Agent Stories. The bulk of this chapter is comprised of case studies of writers who have worked with Agent Stories. The case studies include a qualitative evaluation of their writing process and how the Agent Stories system helped or hindered their work.

Chapter 6 is a comparison of two sets of stories written for Agent Stories and why these two sets differ. The first set was written by myself for the Agent Stories prototype, while the second set was written by the evaluating writers.

Chapter 7 are the conclusions, including what I wanted to accomplish, what was done, and to what extent I accomplished what I set out to do.