# Agent Stories

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## Introduction and Approach

Writers of stories for both print and screen have a deeply ingrained tendency to construct their stories in ways geared toward experiencing the finished work in a linear fashion. With the exception of some videodisc experiments and a few recent video game applications, stories for the screen are usually written, produced, assembled and viewed in and for the linear form. Although viewing a story must always be linear, as a linear sequence of pictures and sounds conveying some meaning, it should be possible to structure and produce a story in a non-linear way for the purpose of providing many different linear play outs.

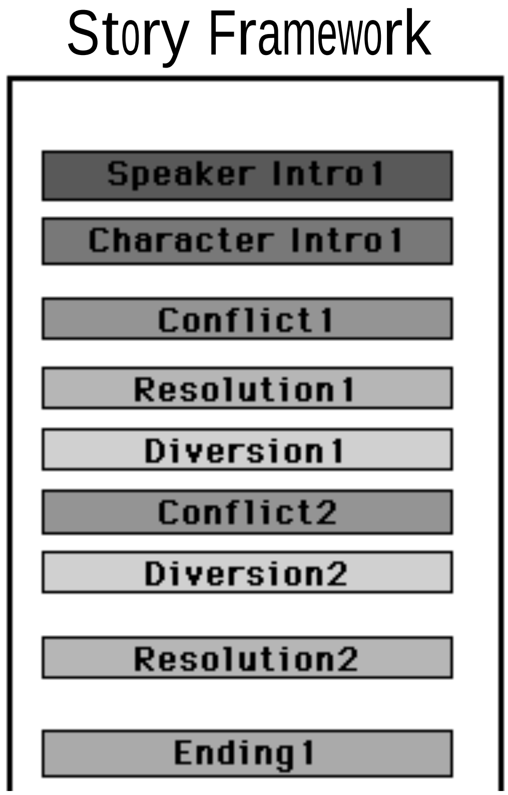
The writing process is naturally non-linear. It is not at all uncommon for a writer to construct an outline of a story that she is writing, work a little on an early part, which inspires ideas for a much later part, which inspires ideas for some part in-between. Characters and scenes evolve throughout this non-linear process. For mere linear assembly, multiple versions of the same scene may be written for the sake of choosing only the best one in the end. Each unchosen scene may have taken the plot in a slightly different direction or given the reader/viewer slightly different pieces of information about one or more of the characters, and thus would have provided them with a different impression of the story as it formed and lived in their mind.

The goal of my current research project, called *Agent Stories*, is to provide a story design and presentation environment for non-linear multiple point of view stories. The approach taken with *Agent Stories* is to assemble stories in either textual or QuickTime movie form by making use of three general components of computational storytelling: 1) the structure of the story, 2) the collection and organization of story pieces with some representation of their meaning, and 3) a navigational strategy through that collection of story pieces, with style and purpose. The hope is that by designing a tool that knows something about the writing process and about what has been written, a symbiotic relationship can develop between writer and writing tool which would foster the creation of non-linear works. Along with the development of the *Agent Stories* tool is an evolving collection of characters and stories called “Crossing the Street,” which serves as the multiple point of view story domain for the project.

## The Tool In General

*Agent Stories* tackles the task of storytelling, or more accurately - story sequencing and orchestration, by breaking the job into three parts. These parts are called: The Structural Environment, in which the structure of the story is defined, The Writer's Environment, in which knowledge of the various pieces of the story are captured and represented, and The Editor's Environment, in which software agents work as text/video editors, intelligently sequencing the different pieces of the story according to the agent’s individual stylistic preferences. *Agent Stories* allows a story designer to create a simple structure or “framework” for a story and then use that framework to tell multiple stories from the same collection of story pieces. The multiple stories are created when different software agents with varying editing/sequencing styles make clip sequencing decisions in accordance with the story framework, the user's preferences, and the existing story material.

The agents learn to tell better stories in as much as they know what “better” is. There is no way to definitively describe to a piece of computer software or hardware what a good or bad story is qualitatively. However, by providing a method for agents to quantitatively judge how good a job they have done at fulfilling the requirements of the story structure, as specified by the story designer, then *Story Agents* will show that given the agent’s stylistic goals, it is possible for the system as a whole to move toward stories which are more in line with the story designer’s vision. Essentially, the system wears paths through the story domain. Meanwhile, it is left to the human story designer to make the good/bad judgment.



### Story Structure

In the Structural Environment, a story “framework” is expressed as an ordered collection of narrative primitives representing the following concepts: **Speaker Introduction**, **Character Introduction**, **Conflict**, **Resolution**, **Diversion**, and **Ending**. Each of these narrative elements describe sections of the designer's intended story. Together, they offer the designer familiar elements for making the story “flow” from beginning to end. It is up to the story designer to come up with a structure that makes sense to her and which is supportable by the existing database of clips.

The story designer builds the framework using colored blocks on the screen, which act as class prototypes for the six narrative primitives introduced above. When the user clicks and drags a primitive block, the system creates an instance of that block type, which is then spatially ordered along with other narrative element instances, as seen in the figure. It is the order of these elements which determine much of the flow of the story.

The order of these elements also suggest certain story genres. For instance, it would make sense for a story to start with a Speaker Introduction, so that the viewer would immediately have a sense of who is telling the story, followed by a Character Introduction, during which the characters and setting of the story are introduced, followed then by the story's first Conflict. However, if the order of just these three simple narrative elements were rearranged to be: Character Introduction, Conflict, and then Speaker Introduction, then the resulting structure would resemble that of the beginning of a typical murder mystery; where first one sees the characters and setting, then the murder as the first conflict, followed by the introduction of the detective whose point of view the story usually revolves around.

Another important aspect of the story’s structure is the linkage between conflicts and resolutions. The Structural Environment provides a way for the story designer to specify whether a conflict should be resolved at the next available resolution element or perhaps strung out until a later resolution element. By making such adjustments to the story structure, it should be possible to effect the rhythm of the story by either repeatedly introducing and resolving a number of conflicts or introducing many conflicts all at once so that story tension is built to a higher level before resolving any conflicts.

### Story Knowledge

The goal of the Writer's Environment is to represent, in a useful way, the narrative meaning of each “clip” in the story domain. A clip is defined as a piece of story from a single point of view (POV), with a single or limited number of narrative meanings. For instance, the meaning (and title) of one clip might be **Anne decides Michael is a klutz**. But this specific meaning is not literally represented by the system. For the purposes of sequencing this clip in a way which makes sense, it is not important to try to have the computer understand what a “klutz” is or what “decides” means. Instead what is represented is each clip's relationship to other clips. By defining different types of relationships or links between clips, the interconnected clips become members of a web of story pieces, which all relate to one another. In other words, clips are defined in terms of themselves.

Examples of links which connect clips together are: **follows**, **precedes**, **must include**, **supports**, **opposes**, and **conflict<->resolution**. Each of these links describe a type of relationship between two clips, and each clip can have many such links. The **follows** and **precedes** links are sequence specifying links and are meant to identify pairs of clips, where information contained in one absolutely needs to be seen before the other. However, these links do not specify that one clip must immediately be followed or preceded by the other or even that the second clip must be included in the story, but simply that if both clips are chosen, then there is an order in which they must be viewed. The **must include** link specifies that if one clip is chosen, then the other must also be chosen, but no order to the clips is specified. The **conflict<->resolution** link specifies that a conflict clip is resolved by a specific resolution clip or clips. The **supports** and **opposes** links offer the system a way of understanding to some extent the relationship between the story’s characters by specifying, for instance, that the meaning or message offered by one character’s clip is in opposition to another character’s clip; or that two conflict clips from different characters are supportive of each other. Through this collection of links and clips, a web of story is defined which can then be navigated by traveling its links as narrative paths.

The Writer’s Environment portion of this project benefits greatly from the efforts of Ken Haase, professor in the MIT Media Lab and author of *Framer*, a database system for knowledge representation and media annotation. The Writer’s Environment itself was created using *ConArtist*, authored by MIT Media Lab graduate student Mike Murtaugh. *ConArtist* is a relational concept representation tool and graphical interface to *Framer*.

### Style Agents

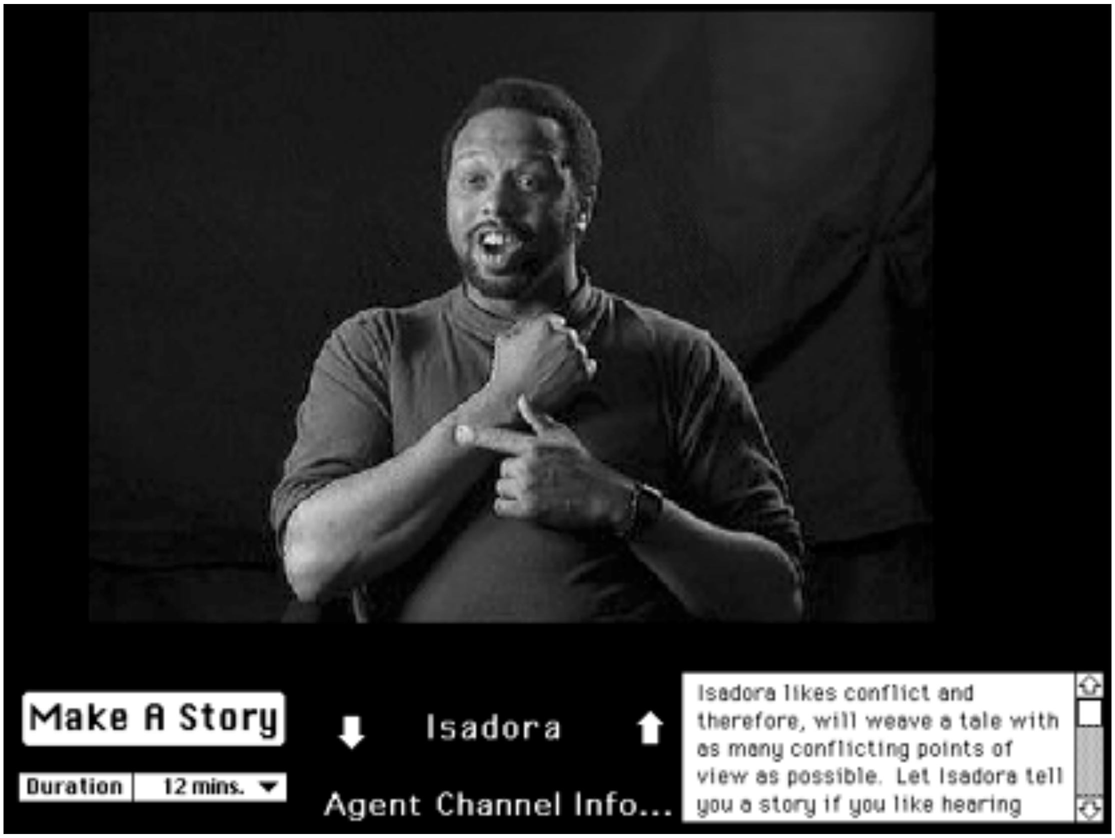
The Editor's Environment uses the notion of Style Agents. A Style Agent is a software agent whose goal is to sequence story clips by navigating a story web and constructing a story by selecting appropriate clips according to the framework created in the Structural Environment. Because each clip is linked in some way to one or more other clips, there are many different ways in which a Style Agent can navigate the story web. This is where the agent’s "style" comes in.

Style Agents can have very different styles for constructing a story. For example: the “point-counterpoint” agent attempts to provide an equal amount of conflict and resolution type of story material from opposing POVs. The “one sided story” agent chooses a main POV character in the beginning of the story, and, during sections of conflict, will first show the conflict from a POV opposing the main POV, then show a conflict from the main POV, and finally during sections of resolution, will show only the resolution from the main POV. The story generated by this agent resembles that of a political commercial, in which POVs opposing the main POV are discredited because conflicts from opposing POVs are never resolved.

Once a framework and story web have been constructed, the *Agent Stories* software allows a user to sit down in front of the monitor and choose a style agent by name (Bob, Carol, Ted, Alice, or Isadora) and have that agent create a story play list by clicking a button labeled "Make A Story," as seen in the figure. Upon doing this, the chosen style agent looks at the characters in the story domain, chooses one as a main point of view character, then weaves a story by selecting clips from the story web following the pattern laid out by the framework. Once all the clips have been chosen, the system then plays the clips in sequence.

## Future Directions

As *Agent Stories* develops and evolves, the user will be able to select a duration for her story and possibly also choose among differing story domains. At present, *Agent Stories* simply sequences clips of storytellers telling first person stories to an off camera listener. Future implementations of *Agent Stories* will include style agents with the ability to sequence short on-location, extreme close-up shots which help illustrate the story. Since sound plays such an important role in making a story believable and helping the listener place themselves “inside” the story, style agents in the future will be able to select, mix together, and play continuous and punctuated ambient sound to further illustrate the story being told.



Isadora likes conflict and therefore, will weave a tale with as many conflicting points of view as possible. Let Isadora tell you a story if you like hearing