Little Red MR

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Little Red MR is an exploration in new methods of storytelling. It is a children's pop-up book that implements techniques of re-creating literary work in 3D using Mixed Reality, or MR technology. The user can read the book wearing a head-mounted display (HMD), and enjoy the story being told through a three-dimensional field.

The set-up of *Little Red MR* looks like a picture book, except with only the scene terrain depicted on the pages. The story begins when the user puts on the head-mounted display and opens the book. With an HMD on, animated 3D images of Little Red Riding Hood and her surroundings pop up on top of the book, telling her story. Each page contains a scene in Little Red Riding Hood's journey from the starting point, her house, to the destination, her grandmother's house. Dialogue and narratives are delivered aurally.

Since both the book (in real space) and the computer-generated graphics (in virtual space) hold three-dimensional information, the user can freely rotate or take a closer look at the book, and his / her field of view reacts accordingly. The terrain is made with materials such as felt and Japanese paper, giving the user a tangible feel of the 3D world. The 2D terrain features work in conjunction with the superimposed 3D animation to present the story to the user in one coherent whole.

Progression of the story in conventional books consists of turning the page, but this is not the case with *Little Red MR*. The story instead develops along with time, similarly to movies. In *Little Red MR,* turning the page amounts to the act of switching the in-storyworld location currently being viewed. For instance, if the user flipped to the page next to the page where Little Red Riding Hood currently is, he or she would actually be able to see the wolf running to get ahead of her. Events can be happening at multiple locations simultaneously, and the user can quickly flip back and forth through pages to experience more of the story than was previously possible with conventional books.

The storyline basically adheres to the original text of the Little Red Riding Hood story, but depending on the user's interaction, it can fork at certain points. For example, if the

user takes the right actions, Little Red Riding Hood may be able to walk across a tree that has fallen over the river, instead of needing to take a detour around it. The story and ending can change depending on the actions the user may take.

In order to explore new possibilities of storytelling beyond what can be done with conventional books, *Little Red MR* interprets the physical form of the book itself as the interface. Therefore, actions such as closing the book, turning the page, and touching the page can be used as metaphoric ways to interact with the story. Also, presenting the story to the user by simultaneously utilizing both rendered 3D graphics and printed illustrations enable forms of expression that would otherwise have been impossible.

Augmented and Mixed Reality is entering the practical stage. Vision based Augmented Reality, which uses markers placed in real space to synchronize the coordinate axis between real space and virtual space, can be expected to be applied to the publishing field, as devices and markers for implementation can be obtained inexpensively. We decided that a book-reading style was suited for Mixed Reality storytelling, since the book, as an object, affords to the user many familiar actions (such as turning and page flipping) that can be used as devices for interaction with the MR scene.

We believe that establishing a new means of storytelling, one where the user views a 3D scene emerging amidst real space, and intervenes in the story using their own hands, will expand the realms of storytelling. *Little Red MR* can be represented as a publication of the next generation, and at the same time, an intuitive and tangible interface for enjoying interactive movies.

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