Augmented Reality based Story Book

Thesis Proposal for
Master of FineArt Degree

Rochester Institute of Technology
CIAS Computer Graphics Design
Dami Youn
Thesis Proposal for the Masters of Fine Arts Degree

Dami Youn
Rochester Institute of Technology
School of Design
MFA Computer Graphics Design

Title
Augmented Reality based Interactive Story Book

Submitted by
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May 25, 2010

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Augmented reality (AR), also known as mixed reality, is the emerging technology that combines graphics, audio and other sensory enhancements over a real-world environment that is displayed in real-time. An augmented reality system generates a composite view for the user that is a combination of real-time digital video images and 2 dimensional or 3 dimensional objects generated by the computer that augments the scene with additional information. The ultimate goal of augmented reality is to create a system in which the user cannot tell the difference between the real-world and the virtual augmentation of it.

The simplest example of visual augmented reality is overlaying a 2-dimensional image on digital video. However, it is also possible to add a 3-dimensional object to the 2-dimensional image. This technology can be applied to video games, mobile applications, and brand marketing.

Since augmented reality elements are not visible to the naked eye, visual augmented reality relies on some sort of display hardware, such as a computer monitor, a television screen, or a mobile device.

Augmented reality systems generally require some indication of exactly where they should augment a digital image. This is mostly accomplished with markers. These markers can be as simple as printing a marker pattern and the placing the printout in the field of a webcam image that is running through the AR software. When the markers are recognized by the augmented reality software, the computer is then able to determine the position and angle of the marker.

There is also markerless augmented reality which does not require the forethought of adding markers to a scene. However, markerless augmented reality has not yet advanced to the point where it is possible to provide a simple way for the public to use the technology.

For this thesis project, I will use augmented reality to entice individuals to read books by creating a more interesting multi-sensory user experience.
PROJECT DESCRIPTION

Are books dead?

In this media rich society, the world of publishing has changed dramatically in the past few years. Even though more books are published every year, people consider that the book publishing industry is in decline since the internet became available to the public. Despite widespread internet usage, reading on a computer monitor or a portable device is still not easy for some audiences. Also, there are still some people who would want to possess actual books rather than download electronic media like e-books. I believe that the emerging technology, augmented reality, could be the solution for this problem. With this technology, interactivity may help overcome passive acceptance of narrative of books. Meaning that, unlike the traditional printed book format, this new approach allows viewers to actively interact with the story and the book itself.

For this project, there will be three main parts: graphic design, motion graphics, and user interface design.

Graphic Design
This book will be 32 pages with 6 augmented reality recognizable markers. It will be a very traditional looking hard cover bound book. The old story “Little Red Riding Hood” will be the main story for the book. There will be five main characters; a mother, red riding hood, a grandmother, a hunter and a wolf.

Motion & Interactive Design
This section will be the main augmented reality part. For this part, I will be using Adobe Flash with the open source library FlartoKit. AutoDesk Maya and PaperVision3D will be used to create 3-dimensional models. These 3-dimensional models will be animated to support the story of the book and to give readers a more interactive multi-sensory experience.

User Interface Design
Since this thesis project needs some kind of digital application to make the actual augmented reality work, designing effective user interface is also critical. Even though augmented reality has been developed over last 30 years, this concept is still new to the public. This means that users need more instruction to go through this process and experience this new technology, so this web based application will contain strong an instruction page.
DESIGN CONCEPT

These are websites use some great PaperVision3D effects.

- Eco Zoo
  www.ecodazoo.com

- Skinny Cow
  www.skinnycow.com

- The Baileys Lounge
  www.the-baileys-lounge.baileys.com

- Dasai
  www.Dasai.es

- DNB Media
  av.dnbmedia.com
IDEA SKETCHES

Project Concept
I will build a HD webcam stand for the thesis show instead of using built-in webcam on the computer for better picture quality.
Character Concept Sketch

The characters will have paper-cut and pop up book look. I plan to combine 2D and 3D look with effective shadow use.

Book Title
THE LITTLE RED RIDING HOOD

The Little Red Riding Hood
Character Cut

Red Riding Hood
TARGET AUDIENCE

This application will appeal broadly to a wide demographic range. The target audience will include these individuals:

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age Range</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both</td>
<td>7 to 13</td>
<td>English-speaking people or people who are learning English</td>
</tr>
<tr>
<td>Male</td>
<td>18 to 35</td>
<td></td>
</tr>
</tbody>
</table>

Mike Johnson
Age: 9 year-old
Educational Level: 3rd Grade
Mike likes to play computer games and love watching SpongeBob. He is not willing to read any kind of books and he thinks that all books are boring.

Semi Kim
Age: 12 year-old
Educational Level: 6th Grade
She is Korean girl who is learning English, so she reads English children’s books to improve her reading skill.

Amy Heller
Age: 31 year-old
Educational Level: MFA Degree
After she got pregnant, she reads children’s books to have a good prenatal influence on her child. However, reading children’s books sometimes makes her bored, so she wants to find more interesting books.

SURVEY OF LITERATURE

Augmented Reality

Emerging Technologies of Augmented Reality
This book provides a good foundation of the main concepts of augmented reality with particular emphasis on user interface and design, and practical AR techniques from tracking algorithms to design principles for AR interfaces.

Augmented Reality
This book introduces how the augmented reality technology works and also provides AR code samples. The author explains how to work with marker-based augmented reality system and deconstructs FlartoKit code.
Book Illustration

The Golden Age of Children’s Book Illustration
The author, Richard Dalby, presents biographies of more than fifty of the artists whose talents have helped create the golden age of children’s book in America. This book features not only popular illustrators, but also less known, but equally talented artists.

Book Markets for Children’s Writers 2006
This is a complete guide to writing queries, preparing manuscript submissions, handling copyrights, and more. Especially, this is a good resource for age targeting and research methods for preparation of publishing children’s book. It also includes lists of children’s and young adult publishers, plus educational publishers.

Writing and Illustrating Children’s Book for Publication
This book features writing exercises, checklists, reading lists and two complementing perspectives on the steps of writing, illustrating and publishing children’s books. The authors provide basic steps for writing — ideas, format, theme, and illustration — and the publisher’s decision making process — submission, revision, acceptance, and rejection.

Once Upon a Time
This book mainly contains pictures of popular illustrations for children’s book from the 1980’s to the early 90’s.

Show & Tell

User Interface Design

Digital Experience Design
With in-depth discussion of a variety of disciplines and topics including screen-based design and e-learning, this book is a valuable resource for learning basics of interactive media. Also, this book covers how practitioners in this field balance the science of usability with abstract factors such as the emotional response design provokes.

Activity-Centered Design
In this book, the authors present glimpse into possible futures for emerging technologies in computer supported collaborative work and learning. Also, it presents how to embed technology design within broader cultural and social contexts.
MARKETING PLAN

To promote my thesis project, I will upload it to major blog sites like Blogspot and Blogger. Also, it will be posted on video sharing web sites like YouTube and Vimeo. I will also submit my finished project to major computer graphics design competitions such as:

<table>
<thead>
<tr>
<th>Competition</th>
<th>Entry Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOW Interactive Design Awards</td>
<td>July, 2011</td>
</tr>
<tr>
<td>Computer Arts Interactive Competition</td>
<td>August, 2011</td>
</tr>
<tr>
<td>American Design Award : Student Annual Design Contest</td>
<td>TBA</td>
</tr>
<tr>
<td>ID Magazine Annual Design Review</td>
<td>TBA</td>
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</tbody>
</table>

BUDGET

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion</td>
<td>$50</td>
</tr>
<tr>
<td>Printing Cost for Documentation Book</td>
<td>$10</td>
</tr>
<tr>
<td>Purchasing Domain</td>
<td>$20</td>
</tr>
<tr>
<td>Purchasing Web Hosting Service</td>
<td>$100</td>
</tr>
<tr>
<td>Printing Cost for Books</td>
<td>$100</td>
</tr>
<tr>
<td>HD Web Camera</td>
<td>$100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$420</strong></td>
</tr>
</tbody>
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TECHNICAL TOOL

Hardware
- Personal Computer both Mac & Windows
- Webcam

Software
- Flash CS4 or later
- Dreamweaver CS4 or later
- Illustrator CS4 or later
- Photoshop CS4 or later
- AfterEffect
- Maya 2010
- Blender

Supporting Programs
- FlartoolKit
- PaperVision3D
- Away3D
- Sandy3D
- Open Collada
PROJECT TIMELINE

2010

April

May

June

July

August

September

October

November

December

2011

January

February

- Thesis Proposal defense
- Thesis Final defense
- Thesis Proposal Submission
- Documentation Submission
- Thesis defense
- 1st Committee Meeting
- 2nd Committee Meeting
- 3rd Committee Meeting
- Thesis Show
- Graduation