

Augmented Reality Comics and the Narrative

So-mi Yoon

Project Committee Chair: Jay Bolter

Project Committee Members: Janet Murray, Nassim JafariNaimi

URL: dm.gatech.edu/~syoon48/mastersProject/

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Abstract

This project aims to explore the possibility of combining augmented reality technology and comics in a way that impacts how the story is told and/or is received. It accomplished this investigation by first examining the necessary background information on both the technology and the old medium to delve into the field (e.g. what comics are, the evolution of comics, augmented reality comics, etc.). Then, a set of design goals was created in order to translate the research into a self-created comic. In order to evaluate if the combination was successful, a brief survey on readers' response to the self-created comic was conducted and the results have been analyzed in this report.

Introduction

The study of comics is a topic that has been avoided by academics for a long period of time due to the fact that comics are often associated with humor and/or silliness. This affinity toward dismissing the idea of examining comics would be further agitated in the 1950s when comics took a popular turn and created the iconic superheroes and commercial images we have come to love. While these characters, such as Batman and Superman, are getting blockbuster films today, back in the 1950s, many concerns about the connection between violence in comic books and juvenile delinquency were raised.¹ In fact, there was a psychologist named Dr. Fredric Wertham, the author of a book called *Seduction of the Innocents*, who said the following in regards to comics:

“Badly drawn, badly written, and badly printed - a strain on the young eyes and young nervous systems - the effects of these pulp-paper nightmares is that of a violent stimulant. Their crude blacks and reds spoils a child's natural sense of colour; their hypodermic injection of sex and murder make the child impatient with better, though quieter, stories. Unless we want a coming generation even more ferocious than the present one, parents and teachers throughout America must band together to break the `comic' magazine.”¹

It wasn't until the 1980s when the idea of studying comic books would be raised as a serious topic. With the help of Thomas Inge, Joseph Witek, and Will Eisner, people began to see comics as a medium with a potency of graphic storytelling. Examinations of how people read and the cultural impacts of these comic books began popping up in books, anecdotes, and papers. Famous comic book artists, such as Scott McCloud and Stan Lee, began pitching their own definitions of comics, further increasing the complexity of the subject.² We will briefly take a look at the definitions and the languages of comic derived from these decades of contributions.

What is a Comic?

It would come to no surprise that when a person begins to define what a comic is, they first try to dispel the idea of a comic being synonymous with the word “funny.” While taking the denotation of the English word “comic” would point to such conclusion, the medium comic should not be considered as so. Stan Lee, a famous Marvel comic artist, says the following regarding the subject:

¹ Coville, Jamie. "Seduction of the Innocent and the Attack on Comic Books." *Seduction of the Innocent and the Attack on Comic Books*. Web. 17 Nov. 2014.

² Bongco, Mila. *Reading Comics: Language, Culture, and the Concept of the Superhero in Comic Books*. New York: Garland Publishing Inc., 2000. 11-12. Print.

“Consider the word ‘comicbook.’ I’ve been fighting a losing battle with every rest of the world over that word for years. Most everybody spells it ‘comic book’ as if it’s two separate words. Thus making it mean a comical book. Such an interpretation would certainly give a casual reader the wrong impression... Now, let’s consider the single word ‘comicbook.’ Ah, what a world of difference! Suddenly, it is no longer an appellation indicative of humorous reading matter, but rather a generic term denoting a specific type of publication.”³

Similarly, Art Spiegelman, the author of a Pulitzer Prize-winning graphic novel called *Maus: A Survivor’s Tale*, tries to distance the word “comic” to the word “funny” by supplying another way of spelling the word. In an interview for *Time Magazine*, Spiegelman said, “But I spell it c-o-m-i-x, so you are not confused by the fact that comics have to be funny, as in comic. You think it is a co-mix of words and pictures.”⁴

This idea that comic is a combination of words and images is not a new one. In fact, in 1985, Will Eisner wrote a book called *Comics & Sequential Arts*, in which he talks about how comics should be considered “sequential art.” In his book, sequential art is defined “as a means of creative expression, a distinct discipline, an art and literary form that deals with the arrangement of pictures or images and words to narrate a story or dramatize an idea.”⁵ In other words, comic is a unique combination of art and storytelling.

Scott McCloud adds to this definition of comic by adding the following sentence in his book, *Understanding Comics: The Invisible Art*: “[comics are] juxtaposed pictorial and other images in deliberate sequence.”⁶ By defining comics in this generic way, the genre becomes not limited to a particular style of illustration, techniques, presentation, etc. as long as the panels within work together to tell a coherent story.

In the decades spent on understanding comic, one thing can be certain – comic is a complex medium that uses pictures, the correlation between these pictures, and the interpretation of the reader to tell a unique story. It is a particular, and often cherished, form of communication.

³ Lee, Stan. Introduction. *Marvel: Five Fabulous Decades of the World’s Greatest Comics*. By Les Daniels. 1991. London: Virgin. Print.

⁴ Bongco, Mila. *Reading Comics: Language, Culture, and the Concept of the Superhero in Comic Books*. New York: Garland Publishing Inc., 2000. 51. Print.

⁵ Eisner, Will. *Comics & Sequential Art*. Tamarac: Poorhouse Press, 1985. Print.

⁶ McCloud, Scott. *Understanding Comics: The Invisible Art*. Winsconsin: Kitchen Sink Press, 1993. 22. Print.

Background

Comic has come a long way from the superhero comic books in the 1950s. Before, comics were the results of the combined efforts among talented artists and mass printing technology. But now, with the advent of the World Wide Web and easy digital illustration programs, the barrier to entry has been lowered, allowing people to invest their interest and love in comics by creating their own. Technology has afforded the ability to create these pictorial narratives for anyone with artistic capability.

Scott McCloud recognizes this shift in the creative pool, and offers couple of tips for the rising enthusiasts in creating their own comic, or a “web comic.” The following image describes one of the tips written in McCloud’s website:

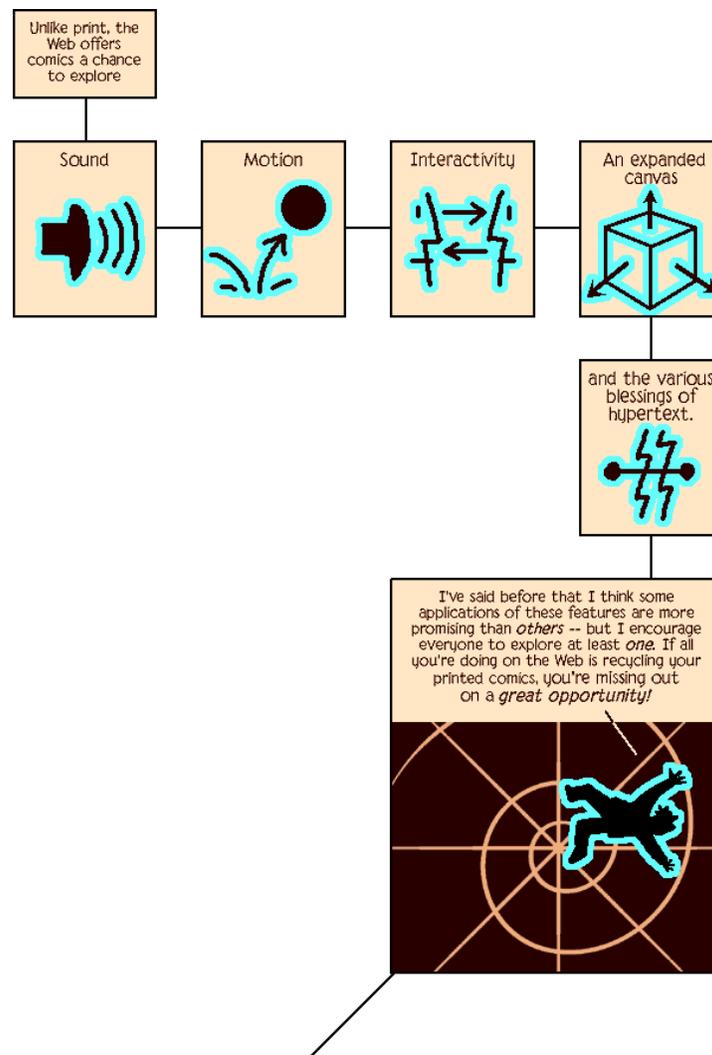


Figure 1 The image above is taken from the online appendix to McCloud’s book, *Reinventing the Comics*. This series is called “I Can’t Stop Thinking,” and in this specific panel, McCloud shows the different types of affordances provided by the medium to the artist.

In this tip, McCloud points out the affordances uniquely offered by webcomics – the addition of sound and motion, the ability to have users interact with the comic, the capacity to stretch the panel as far as the artist wishes, and the addition of specific connections between pages, panels, etc. via hyperlinks. Over the years, various creators have experimented with these affordances, resulting in mixed outcomes.

In 1996, Marvel began releasing weekly issues of online comics called Marvel Cybercomics.⁷ It was one of the first webcomics that blended together traditional comic techniques with computational functionalities such as changing its content through simple user interactions or implementation of in-frame animations. As the decade progressed, newer and better web technologies were utilized, leading to the birth of a more modern feeling animated comics, Motion Comics. However, Marvel Cybercomics and Motion Comics were put on the sidelines, as they were never the focus of Marvel. Instead, the emphasis was placed on making static digital editions of Marvel's backlist titles.

Marvel Cybercomics and Motion Comics shared a good bit of success in the light of the fandom. Well-known comic book artists sold art files that were well over twenty minutes long on various online distribution networks such as iTunes, Zune, Xbox Live and Playstation Network.⁷ The audience were encouraged to engage in the universe by getting involved in a fan fiction contest sponsored by Marvel. These online comics, though not too well known, expanded the general acceptance of webcomics.

One of the most notable example of dynamic content generation and manipulation of traditional comic convention is a webcomic called Homestuck. In the words of its author, Andrew Hussie, Homestuck is "a story about some kids who are friends over the internet. They decide to play a game together. There are major consequences."^[3] What is intriguing about Homestuck is not the narrative or the content itself, but how it was perceived by the audience and how the author attempted to involve the reader.

Similar to Marvel Cybercomics and Motion Comics, individual panels in Homestuck utilizes in-panel animations. However, any similarities end there. In the earlier years of this webcomic, before the fan base became too large to control, Hussie ended each panel with a prompt for the audience to respond to. On his website, Hussie gives an explanation and an example of user interaction: "The whole story is presented in the form of a mock-game that the reader 'plays.' We start with the hero John, and the 'player' tells him what to do, by way of text commands from classic adventure games. Readers submitted these commands, and I picked ones I liked, and drew the result."⁸ (figure 2) As such, the content was dynamically generated every week, which sometimes led to an incredibly random turn of events.

⁷ Wershler, Darren. "Digital Comics, Circulation, and The Importance Of Being Eric Sluis." *Cinema Journal* 50.3 (2011): 127-134. Academic Search Complete. Web. 25 Mar. 2013.

⁸ Hussie, Andrew. "What is Homestuck?" *MS Paint Adventures*. Web. 26 Mar. 2013.



Figure 2 First page of Hussie's webcomic "Homestuck." In this scene, the reader of the comic is prompted to enter in the main character's name.

Hussie is also aware of his fan base and tailors his webcomic to suit their needs. He realizes that his comic is well perceived by a specific niche of people - the online community. As such, he often makes geeky and/or nerdy references, such as designing user interaction around command line based actions, a reference to old text adventure games. In fact, the webcomic's initial storyline can be sympathized by the younger generation since it is based on children's desire to get on the internet to play a game with their friends. Hussie successfully synergizes the quirky and zany nature of online culture into a collaborative artistic experiment to create this unique webcomic.

There is, however, another technology that could also offer all of the five affordances detailed in McCloud's tips. This technology is Augmented Reality (AR). The characteristics of AR are listed in Greg Kipper's book, *Augmented Reality: an Emerging Technologies Guide to AR* as the following:⁹

- 1) AR Combines real and virtual information
- 2) AR is interactive in real time.
- 3) AR operations and is used in 3D environment.

AR is a versatile medium. It allows the author to combine real and virtual information, which can be sound, motion (e.g. animation, videos, etc.), and/or hyperlinks, to elicit action from the user, creating interactivity between the art and the reader, and to expand the canvas by introducing a new, 3rd dimension. By having all of these characteristics, the affordances provided by AR technology and the universality of comics could be combined into a powerful method of communication.

⁹ Kipper, Greg and Joseph Rampolla. *Augmented Reality: An Emerging Technologies Guide to AR*. Amsterdam: Elsevier, 2012. 3. Print.

Current Work in the Field

In his paper, “Potential Panels: Toward a Theory of Augmented Comics,” Jason Helms states that “while augmented reality has been around the sixties, augmented comics are of recent advent (beginning in 2010). Since little if anything has been written on them from a scholarly perspective, this history of augmented comics will be brief.”¹⁰ As augmented comics are indeed a recent event, this project’s list will also be brief.

On April 2014, Marvel released an application on the Android market called “Marvel AR.” This program allows the user to get additional information about the comic they read. The typical interaction happens thus: the user buys a comic book that has states its compatibility with the Marvel Augmented Reality application. Inside the comic, there are panels with the AR App’s logo, prompting the user to launch the application and put their augmented device pointing at the panel. After a couple of seconds, some sort of media is played. These media typically are animated segment of the panel, or some form of commentary from the authors (figures 3 and 4). By allowing users to have these augmented windows to additional information, Marvel has allowed comics to have metadata. This form of comic has a potential to be a powerful tool for communication, as information now can be distributed through more than the traditional avenue.



Figure 3 (left), Figure 4 (above) The pictures above and left of this text shows a sample of what the output of the Marvel AR application may look like. On the left, a 3D model of Iron Man displayed, and above, a commentary video by the artists is played when the user hovers their AR device (phone, tablet, etc.) on the designated page.

¹⁰ Helms, Jason. "Potential Panels: Toward a Theory of Augmented Comics." *Augmented Reality: Innovative Perspective Across Art, Industry, and Academia*. n.d. Ed. Sean Morey and John Tinnell. n.p. Print.

François Schuiten took more of an artistic approach when using the augmented reality technology for his comic, La Douce. The story follows the decline of locomotive travel from the perspective of an engineer-stoker named Léon Van Bel. As time goes by in the narrative, it is revealed that Léon feels conflicted with how old trains, such as La Douce, are being disposed, as they are no longer useful. Schuiten allows the reader to feel the same wonder and awe that Léon considers of the locomotive by implementing beautifully animated AR segments.¹¹ These scenes would be played when the user hovers their AR devices on top of certain panels (figure 5). The website for the comic advertises that the experience is so stunning that it would feel “as if you were there.”

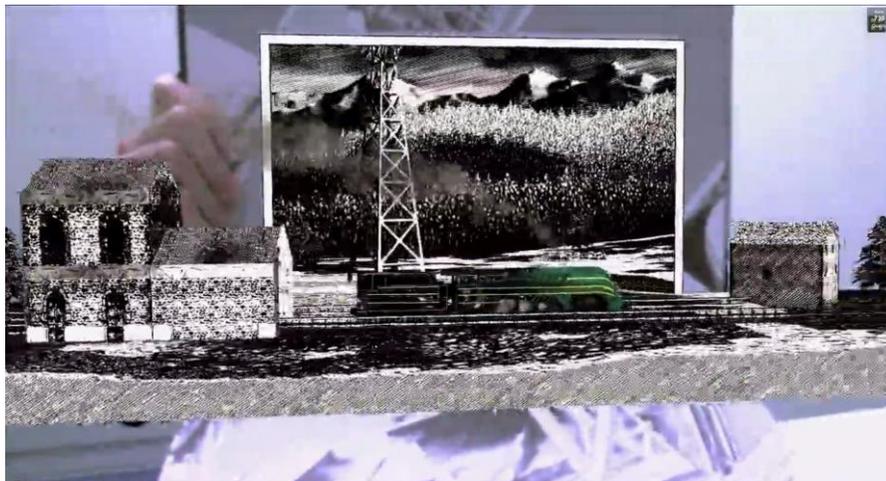


Figure 5 An example AR panel from the graphic novel La Douce. When the user looked into the AR device, they would watch this 3D model of the locomotive zooming by various buildings, trees, etc.

Another example of a comic that uses the augmented technology as an added special feature is Anomaly. As stated in the author’s website, “Anomaly is an epic tale of deception, redemption, and unity set on a strange alien world and the longest original full-color graphic novel ever published.”¹² While it may be the longest original full-color graphic novel, the comic does not hold any special title when it comes to its use of augmented reality as it adopts the typical usage of the technology. When the user floats over the designated panels on the comic, various additional information, such as 3D rendering of a monster, character biography, different angle of the space battle, etc. are displayed on the screen (figure 6). Though the extra material allows the reader to better understand and imagine the world in which the characters of the story are living in, it does not develop the story further or affect the perception of the narrative in any form.

¹¹ "As If You Were There." *12.004 La Douce*. Web. 18 Nov. 2014.

¹² "WHAT IS ANOMALY?" *Anomaly Productions*. Web. 18 Nov. 2014.



Figure 6 The screenshot above shows an example AR segment in the comic Anomaly. In this panel, the user can look and rotate the device around to get a better view of the 3D model of “Teanna Desert Dwellers”

There is, however, an augmented comic that does look into how the narrative is told. On August 6th, 2014, a Kickstarter named “Modern Polaxis – Augmented Reality Comic Book and App” was funded.¹³ This comic was one of the more unique ones as the augmented technology revealed how the narrative was perceived by the main character, Modern Polaxis. Polaxis is not the typical hero figure. He is a paranoid time traveler who believes a lot of conspiracy theories, which are locked and hidden away in his journal. The journal entries can only be accessed by the AR app (figure 7). By separating the story in such a way, the author, Sutuu created two distinct ways that the reader can experience the narrative, thus affecting how it is told and how it is perceived.

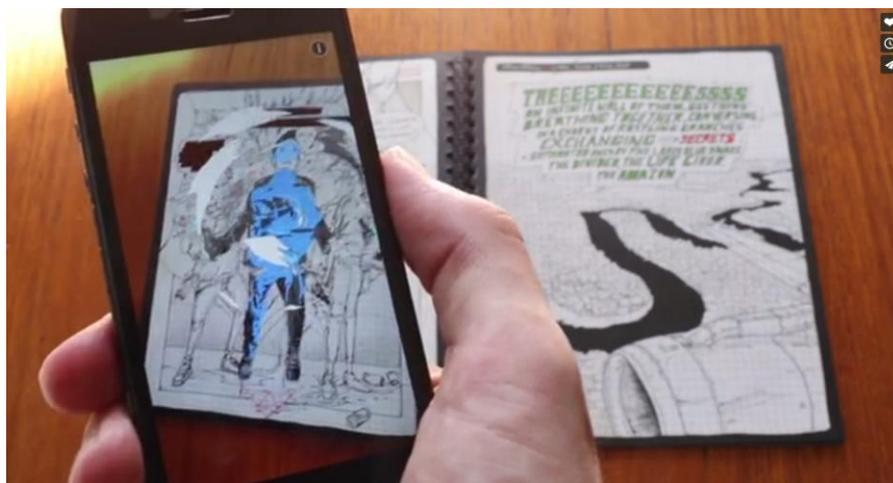


Figure 7 Above is an image taken from one of the pages of Modern Polaxis. In this scene, the main character is convinced that he has time travelled. However, the proof would not be visible unless the user looks at the scene with their AR device.

¹³ "Modern Polaxis - Augmented Reality Comic Book and App." *Kickstarter*. 6 Aug. 2014. Web. 18 Nov. 2014.

Recent implementation of augmented reality for comics have mostly been focused on creating ancillary and/or Easter egg-type of information for the reader. None of the data presented in this form have been crucial or necessary in enjoying the narrative. However, displaying a 3-dimensional rendering of a 2-dimensional image can be considered an artistically beautiful scene for a reader to experience, as depicted in La Douce. Additionally, having behind the scenes videos from the authors themselves creates the perception that a stronger, personal connection has been made between the reader and the authors. These AR comics have achieved the three characteristics of AR, as outlined by Kipper in his book, as well as providing the affordances of new age comic as McCloud suggested in his “10 Suggestions for First-Time Webcomic Artists.”

Approach

When the proposal was made for this project, I originally intended to explore the affordances and the limitations of the technology, augmented reality, when it concerned the topic of webcomics. Specifically, I had stated the following: “The examination of this topic will mostly focus on the technical challenges and techniques used for producing the project, though the importance on audience reception, narration, and collaborative creation will also be taken into consideration.” However, upon doing the background research regarding comics and augmented reality comics, I realized that there was a clear problem space of the technology eclipsing the storytelling capability of comics. By this, I mean that most often, people focus on implementing the cool 3D overlays or the supplementary data for the world when they try to meld the two media together. While applying AR in this way uses the technology to its fullest capability, it seemed to be doing disservice to comics. After all, comics are a unique form of narration. I began to wonder, rather than using AR technology to captivate the readers with stunning visuals and/or sound, can it be used to enhance the way the story is explained to the reader? As such, my approach at exploring comics and augmented reality altered a little from how it started. The project’s focus changed into researching and expressing ways that the knowledge gained through the augmented reality device affect the way the narrative is either told or perceived.

Designing the Project

As stated in the “Approach” section of this report, I realized that in order to understand the connection between comics and augmented reality, I had to address the intent of comics. In the book Reading Comics: Language, Culture, and the Concept of the Superhero in Comic Books, Mila Bongco explains that “narration, broadly defined, is the intent of comicbooks; their pure purpose is to tell a story.”¹⁴ As I looked through the current work in the field, I realized that most of the projects that are currently active in the world do not address this supposed fundamental affordance of comicbooks. Too much focus has been placed upon the technical merits of the medium used to tell the narrative, rather than the harmonious union of the two.

Due to this realization, when I was designing the project, I decided that the comic that I try to implement should have the following approach as its core mechanism: the comic should create a story whose outcome and/or understanding of the situation gets affected by the augmented information a reader can receive. The basic idea was to have two parallel storylines that affected one another at certain points in the comic. By presenting the accounts in this fashion, it was hoped that the reader who is not using the AR device would be confused enough to be compelled to look through the comic again with the AR lens. The AR portion of the comic would explain why certain phenomenon had happened in the clashing moments of the comic.

In order to achieve this sort of parallelism, I first brainstormed for a variety of story ideas that I could implement. Since the aim of the project was to experiment in the ways the narrative can be told, I decided that it would be best to focus on the types of adventures I could lead the reader through. While I thought of many different concepts, there were two distinct ideas that I settled upon (figure 8 and figure 9).

¹⁴ Bongco, Mila. Reading Comics: Language, Culture, and the Concept of the Superhero in Comic Books. New York: Garland Publishing Inc., 2000. 54. Print.

Page 1: murder reveal – someone was murdered and main character is on the case.
 Page 2: murder explain – victim was shot in the head, but the evidence around doesn't seem to make sense.
 Page 3: back story – briefly explain why this victim is important to him. Flashback about the first time they opened up for business.

Parallel AR
 The ghost speaks fondly of the partnership, saying that it is happy with where the boy had ended up in his life.

Page 4: meet up with old friend – Awkward hello to one another. Friend totally has a crush on the guy, but the guy is oblivious.

Parallel AR
 Ghost sarcastically makes jokes about how socially inept he is (and has always been).

Page 5: meet up with old friend (cont.) – main character tries to talk to old friend to get some suggestions; friend doesn't give much helpful information except at the end she randomly suggests to go to a gypsy

Parallel AR
 Ghost knows that she has information she could help; ghost possesses the friend in order to tell the main character that he should go to the gypsy and talk with her.

Page 6: way to the gypsy – has a flash back about the past; back story reveals that the main character suffered from autism and no one though he was going to amount to anything... until the ghost character came in and helped by suggesting that he gets into investigation business

Parallel AR
 Ghost's flashback reveals that the help wasn't all that benign. She was working for a crime lord that saw the potential in the main character and wanted her to encourage him into getting into law so that the crime lord can use the main character for nefarious, illegal reasons.

Page 7: arrive at gypsy hut
 Page 8: talk to the gypsy – main character is incredulous of gypsy's power. Gypsy states that there is a ghost hanging around the main character.

Parallel AR
 Gypsy can see the ghost, so the ghost is talking a bunch to the gypsy.

Page 9: meet the gypsy – gypsy prove her power by asking the ghost a personal question. When given the right answer, the main character blushes in embarrassment and then asks the gypsy if he can talk to the ghost.

Parallel AR



Figure 8 Above is the outline of the first idea. The gray boxes denotes the parts of the story where the AR overlays would be used.

Figure 9 Above is a sample page from the second idea. The last panel of the page would have the needed information to solve the puzzle.

The story in the first idea follows a detective on one of his murder cases. However, this case is a unique one as the victim in this story is the detective's assistant. Without the augmented reality portion, the reader would be led through a typical murder mystery scenario with a little bit of mysticism sprinkled at the end. The narrative would start with the examination of the murder scene, followed by a meeting with an old friend. It would end with the detective talking to the victim's ghost through the gypsy in order to find additional evidences and then leaving the scene. Within the transition pages (e.g. murder scene to meeting with friend), the detective would have flashbacks in order to tell the background story of the relationship between the victim and the detective. The augmented reality portion shows the same storyline, except with commentaries, actions, and/or background information provide from the victim's ghost. The ghost would interact with what is happening on the panels in order to alter the progression of the story. For example, within the narrative the old friend randomly tells the main character, the detective, to go see a renowned gypsy in order to get more evidence. Though this blurb from the old friend may seem random, if the reader was using the AR device to examine the panel, they would realize that the ghost had temporarily possessed the old friend in order to inform the detective that there is a way to communicate with her. Using the AR technology in this way could dictate the way the reader interprets the situation.

The second idea is more of an interactive game type of comic. The story takes the reader through a murder scenario as well, but the perspective that is used to present the narrative is through a first-person perspective. As such, the main character of the comic ends up being the reader themselves, and it is up to the reader to figure out the clues and eventually point to the correct murderer in the end. In this world, the AR technology is used by detectives, like the reader, to obtain extra information on the scene. For example, though the naked eye, it could be that there is a strand of certain colored hair on the murder site, causing the reader to suspect person A. However, the AR view would prove that there were other colored hair on the site, which could give mixed information to the reader and have them consider other possibilities. This comic would provide situations where the reader would have to involve themselves and fish for information from each panel.

While both ideas had potential, I decided to go with idea #2 for the inception of the project. The reason being, I felt as though if the reader was forced to have some sort of interaction with the comic, it would be easier to evaluate the effectiveness of the synergy between the comic and the technology. Comic idea #2 would end when the reader makes the accusation and I could collect various data (e.g. did they pick the correct choice? Why did they choose that person?) to see if the perception of the narration changed due to the information presented for the reader.

Implementation



Figure 10

Above is a screenshot of the first page of the comic. Any reader who tries to access the comic with the provided URL will land here. The story begins with the main character, or in this case, the reader, waking up to get ready for work. There is a little bit of humor thrown into the narrative (e.g. the other character in the first page telling the main character that they're late) in order to follow the tone of the comic genre.

Apart from the comic and the basic navigation buttons underneath it, the page also features an "authors note" section, which has small blurbs from the author, and a comment section where the readers can respond to a specific page of the comic (figure 11). The comments functionality is programmed so that the reader must put in a message before submitting the form. The "NAME"

portion of the comments section is not necessary, and if the reader chooses not to write down their name, their comment will show up as written by “Anonymous.”

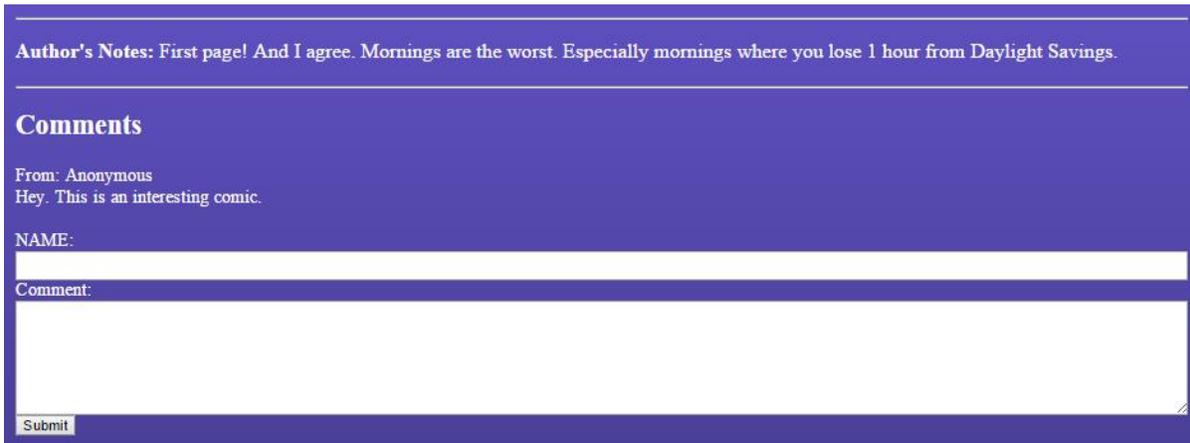


Figure 11 Above shows the Author's Note and Comments for page 1

As the reader goes through the narrative, it becomes clear that the main character must investigate the murder of a lady named Helen Back. Eventually, the reader would realize that they need to download Aurasma to view the augmented reality portion of the comic. I wanted the reason as to why the reader had to go and get the program to be explained through the comic. In order to persuade the reader of this necessity, I wrote the entire comic in first person perspective. Since the narrative takes place in a society where the detective use a special technology to view additional information about the scene, it would be easy to tie together the main character's persona and the requirement of the reader to get Aurasma. However, the decision to change the perspective from the traditional third person to first person brought about its own artistic challenge. Not only are there almost no comics that utilizes first person perspectives, but to reflect the way people see the world normally in a comic panel is a difficult task to accomplish. In order to achieve believable scenes, I had to take pictures of various locations and outline the objects within the image (figure 12).

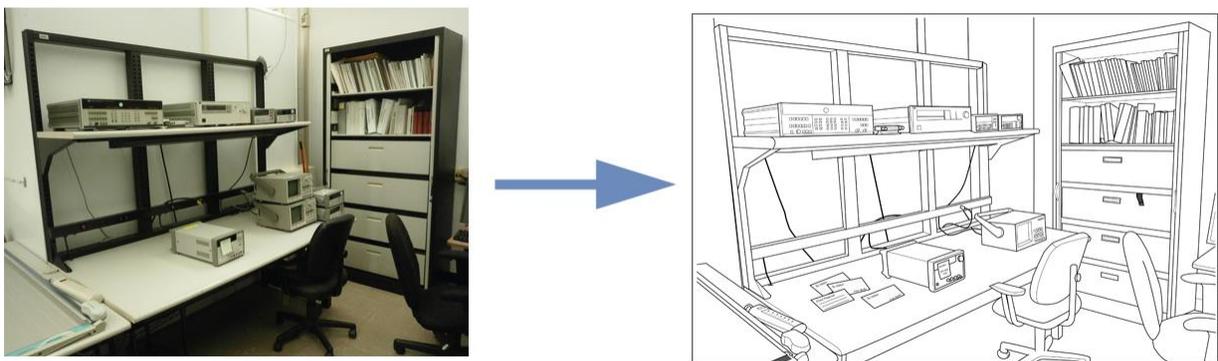


Figure 12 On the left is the picture of a lab at Georgia Tech. The various objects inside the room (e.g. instruments, bookshelf, etc.) were outlined and placed as one of the comic's panel.

For pages 4 and 5 of the comic, the main character decides to go to various locations mentioned in the paperwork in order to find more evidence. Upon arrival to these location, the reader is then prompted to search the room for clues. Without the augmented reality portion of the comic, it would be up to the reader to hunt down the traces of the murderer. For example, in the murder scene, the reader would be presented with the following panel:



Figure 13 This is the murder scene as depicted in Page 4

If the reader looks with careful consideration at the scene, there are four clues that the reader could obtain: orange hair on the table, the words “B-A-N” being written by the victim’s right hand, a button on a shirt, and a plaid-colored cloth:



Figure 14 These are the clues the reader would have found when looking at the murder scene on page 4

Considering these evidences, it would come to no surprise if the reader suspects the murderer to be one of the suspects named “Robin D. Banks.” However, if the reader had the augmented reality segment of the comic through Aurasma, this is what they would have seen when they looked at the murder scene:

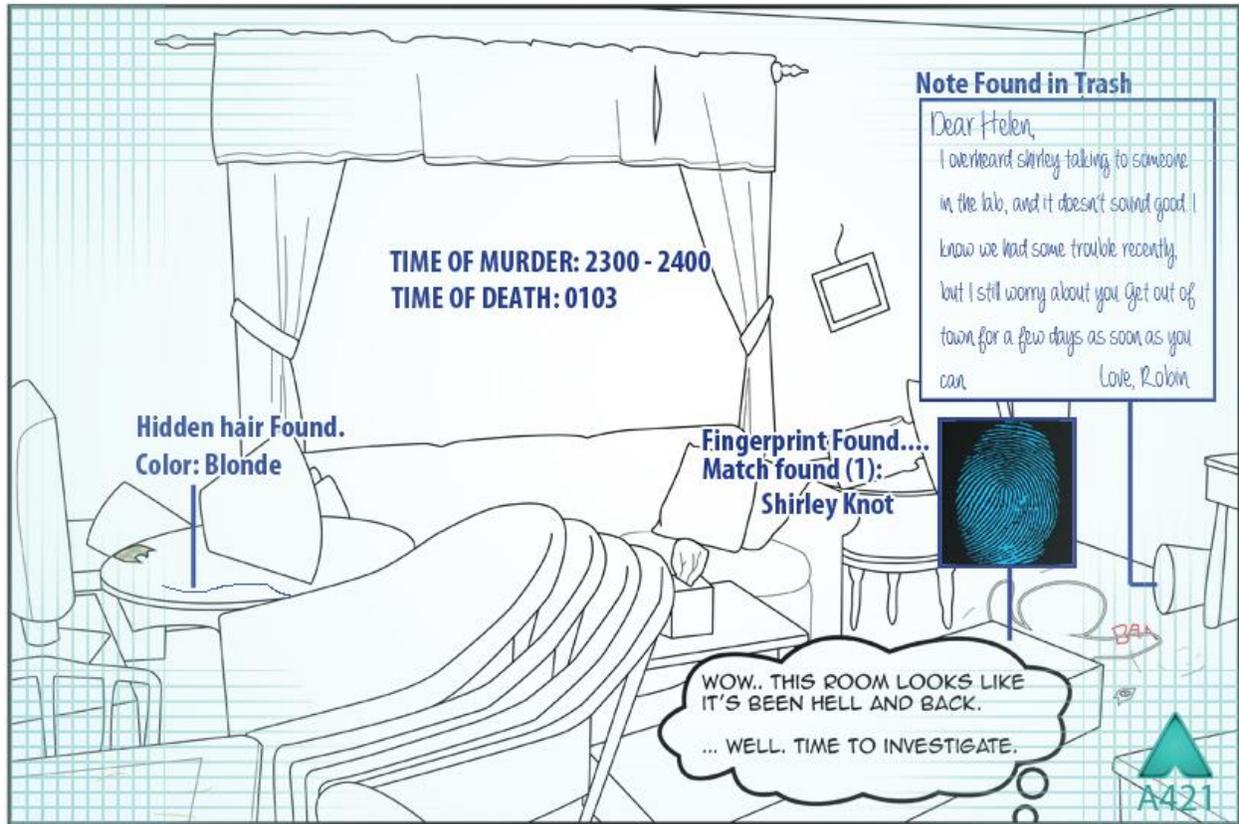


Figure 15 Putting the AR device over the scene reveals additional information on the murder scene that could not be examined on initial view

Now with these discoveries, the reader would reconsider their accusation of Robin D. Banks, and perhaps even wonder if the murderer was actually Shirley Knot.

At the end of the comic, the reader is pressed to make a decision on who the murderer is. At the bottom of page 6, there is a HTML form named “Legal Accusation (LA) Form – 13.” The form is very simple and consists of only two components: the name of the murderer and the reason as to why the Helen was killed (figure 16).

Legal Accusation (LA) Form - 13

NAME OF THE ACCUSED:



I find that the accused is responsible for the crime of murdering Helen Back because of these reasons:

Signed,
A421
 - IntelliCorp - Investigation Division 8

Figure 16 Above shows how the Legal Accusation Form – 13 looks on screen. The reader can choose who has committed the murder and why.

Depending on the answer given by the reader, the comic reveals either the good or the bad ending. In the good ending, it is revealed that the murderer was Shirley. Shirley was part of a group that hopped from lab to lab, draining funding money before they worked to disband the lab from proceeding. Now that the main character has stopped her from continuing her fraudulent schemes, they can go back to the daily grind of being part of the investigation division (figure 17).

If the reader had chosen incorrectly, the story would go on to say that the accused committed suicide inside their cell. Feeling responsible for the person’s death, the main character decides to quit the investigation division, saying that they do not have the right to condemn a person to life or death (figure 17).



Figure 17 Above shows the possible two endings to the narrative. The one on the left is the good ending, with the culprit getting caught. The screenshot on the right is of the bad ending caused by the reader picking the wrong person

The Readers' Response

In order to assess the outcome of the comic, I had to make sure that I received feedback from the readers. The original plan was to examine the comments left by the readers on the individual pages to analyze the success of the implementation. But, due to the technical difficulties, I had to alter the method and personally show the comic to interested parties and listen to their reactions. As such, the study ended up being a series of very informal one-on-one sessions. These discussions started off with a person inquiring me about the project. Eventually, they would be given access to the comic, and as they read through, they would exclaim various remarks, which I took notes of.

The initial run of the comic brought about many complaints and criticism regarding how the information was presented to the reader. Some stated that there was simply too much to read in the panels. For example, the amount of text and subtle clues that was present in the e-mail screen was not obvious enough for the readers to pick up (figure 18).

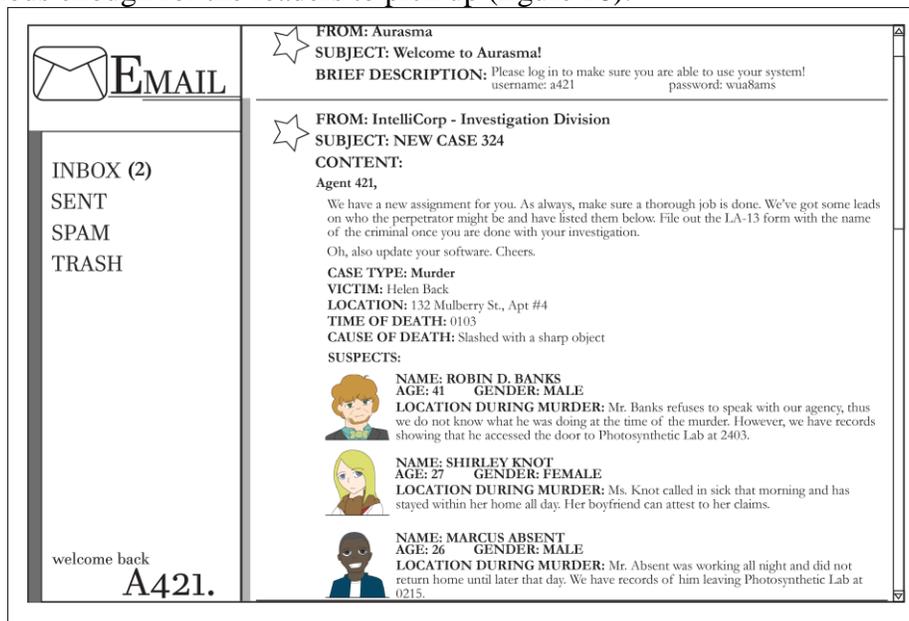
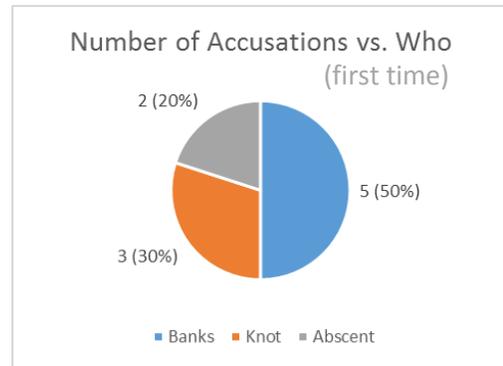


Figure 18 Above shows the e-mail screen the reader had to look through. Most reported that there was simply too much in this scene and nearly none found the username and the password written within the first mail

Some stated that the clues within the investigation panels were not obvious enough for them to discover. For example, there were some who could not find any incriminating evidence in the murder scene, despite the fact that they knew they should be finding some. Even after calling attention to one of the clues, the reader could not find the others.

As for how the comic was read, most readers took time in appreciating each panel and paid much attention to the dialog and the investigation segments. In fact, some readers asked if they had found all of the clues after staring at the investigation scenes for a while. However, if the reader got the wrong person for their accusation at the end, most of them simply smashed the replay button, clicked until they got to the last panel, and randomly guessed who the culprit was. A handful of the readers asked me directly what they had missed. It would be at this time that I would disclose the AR portion of the comic. Once these readers saw the AR scenes, they were able to correctly guess who did it and also explain the motivation of the culprit.

The chart on the right shows the results of who the different readers picked as the culprit when they read the comic through for the first time. These numbers were recorded, by hand, whenever the reader clicked the “submit” button inside the LA-13 form. While the numbers seem to favor picking Banks as the culprit, the process which the readers went through when making the decision seemed rather random. Their initial reaction seems to be to click on a person first before thinking about writing down the reasons. In fact, many of the readers struggled to write reasons for the accusation.



Overall, readers seemed to be interested in the narrative style portrayed through this project, but wished that there was more to find and/or read.

Extensions and Future Work

Through the implementation of the project and the evaluations from the trial runs, there were three general problems the comic struggled with:

- 1) There was too much information or the subtle information was not obvious enough
- 2) When the story was read a second time, readers did not look through the comic again
- 3) Not adequate enough reasons were given when the accusation was made, thus making the process feel arbitrary

As an extension and future plans for this project, I would try to address these problems in the later versions of the comic.

Problem number one and three can be resolved by implementing two edits to the comic. One is to spread the data throughout the comic, rather than having it all on just the last panel of each page. Displaying all of the evidence in one panel would certainly feel overwhelming for the reader, especially with the level of detail that exists for each of the rooms. For example, page four has the three panels where the character goes up the stairs and the fourth panel where the character enters the very messy apartment. Instead of having all of the clues in the messy apartment, what if some of it was on the stairs? I could have placed the hair fragments or the plaid-colored cloth on the steps. This would lessen the clutter which the reader would have to cipher through on the last panel.

The second edit is to add more clues throughout the narrative so that the reader has a larger collection of evidence to find and to choose from when making the accusation. Without the augmented portion of the comic, the maximum number of items that the reader can find in the investigation scenes are three. Three is not that many, and the reader would be hard-pressed to find enough reasons to make the decision at the bottom of page six. Adding more data would increase the chance of the reader finding the subtle information and allow the reader to determine the culprit with confidence.

In order to address problem number two, there are two possible solutions that could be implemented. The first solution is to make the suspects' and the actual culprit's names random so that the reader cannot remember who they have chosen before. The second solution is to make the reason portion of the accusation form matter more than it currently is. As of right now, the reasons textbox does no content analysis when the reader clicks the submit button. It simply records the entry in a SQL database. However, if I were to add an algorithm that compares the keywords typed into the reasons textbox with the answers, and then it directs the page to an ending depending on if a) the reader accused the correct person and b) the reasons stated were legitimate, the reader might be less inclined to randomly guess who the culprit is.

More than just the 2-dimensional image

While changing the comic is a great start for improvements in the near future, I believe there are other methods that AR could be used in order to enhance the way the narrative is told.

One of the well-known characteristics of AR is to use Global Position System (GPS) to determine what the device will show. What if that technology was used in order to determine which panels the comic book would appear on screen? It would be up to the reader to carry the book to different locations to see the different storylines each location would offer. For example, if the book is taken to a city, like Atlanta, the scenery in the comic would reflect the urban setting, and the main character could use the numerous building as a hiding spot. If the book is taken to a rural area, the character in the comic could be placed in an open, grassy field (figure 19). This feature would allow the artist to decide if they want present or hide certain information critical to the narrative. As a result, it would encourage readers to go to other locations to experience the story in new ways. The action would resemble an Easter egg hunt, except with comics. Even if the reader does not go to these specific location for the purpose of reading the comic, if they ever travel to the destination, the comic could serve as an additional memento.

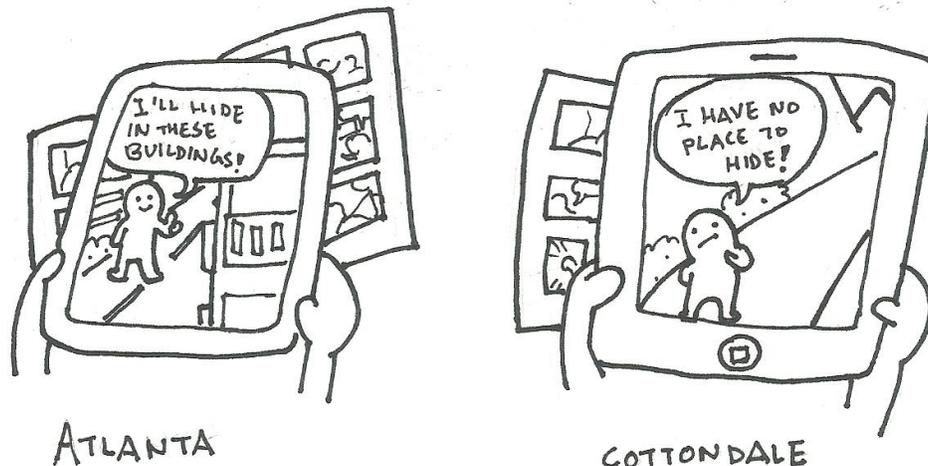


Figure 19 Above shows preliminary sketches for an idea to incorporate GPS and AR into viewing comics. On the left the picture shows how the scene looks in a crowded city, such as Atlanta. On the right, it shows how the scene looks in a rural area.

Another idea is to extend the panorama idea of AR technology. What if the user can immerse themselves in each of the panels in the comic? This idea would work better with a virtual reality tool such as an Oculus Rift. The reader would load up the comic, put on the goggles, and then be dropped within a panel of the comic. The reader could look around to reveal the dialog surrounding the character (figure 20). In order to progress the story, the reader would click on a button to reach the next panel. By keeping the interaction of the reader confined through the button, the perception of the comic being a “sequential art” could still be maintained. As for how this would affect the narrative, having this 360 degrees of viewing space gives the artist a very, very large canvas to work with. It extends McCloud’s idea of having an “expanded canvas,” where the limits of storytelling is stretched to multiple dimensions. Artists could introduce a larger array of creative writing techniques, such as implementation of suspense and intricate

character introductions. But, it would be up to the reader to explore the space and appreciate the extensions that the technology offers.

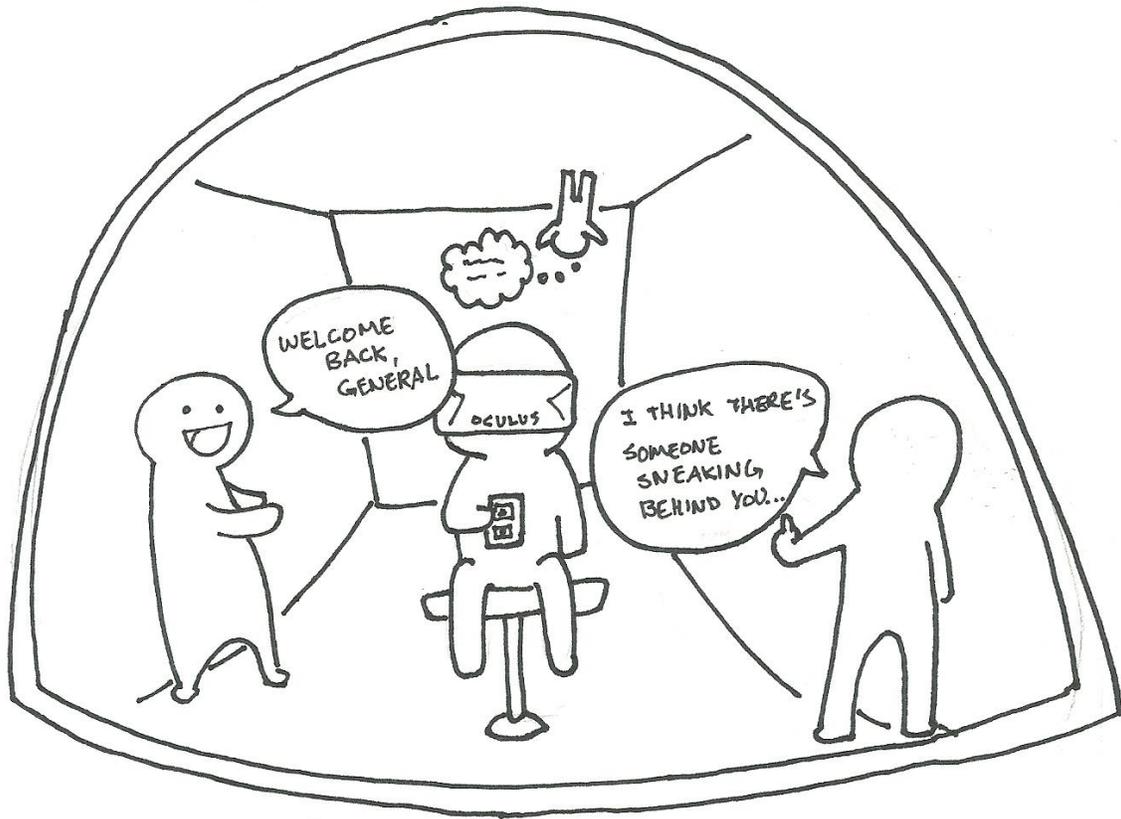


Figure 20 Above is an example of how panorama technology could be used to present the comic. The reader would be surrounded by the characters, text, and setting. There would be buttons to help the reader navigate from one panel to the next.

Conclusion

Through researching the recent publications of augmented reality comics, it was shown that the gap between technical merits and storytelling existed between the two combined media. This project aimed to explore the theory of using AR to enhance or alter the reception of the narrative. Though the implementation of the theory was not stellar, I still believe that there is an interest in experimenting with the technology in regards to designing the experience of the reader. The handful of trial runs I've conducted with my comic showed that people found this type of AR refreshing and not as gimmicky as other AR comics (e.g. Marvel AR App). With Kickstarters such as the one for "Modern Polaxis" becoming funded, the existence of interest in people wanting deeper relationships between their AR device and art is clear. In addition to the interest, there also exists potential for AR to change the art of comic narrative. This project showed that it is possible to present a set of information in one way to persuade the reader to read the narrative at a surface level, while the exposure to the AR portion prompted a different response, understanding and appreciation of the story.

As a side note, it should be noted that the comic demonstrated through this project is not the only way an artist could use AR to create a provocative connection between the technology and their work. As stated in the "Future Works" section of the report, there are countless other combinations and applications a person could implement and observe the effects thereof. I believe that if a longer study is done regarding the different methods in which technology is used to tell a story, it could contribute significantly to the field of augmented reality comics.

Deliverables

The comic can be accessed through the following URL:

dm.gatech.edu/~syoon48/mastersProject/

In order to experience the augmented reality portion of the comic, you will need to download the Aurasma application on your AR device (e.g. smartphone, tablet, etc.) and log in using the following credentials.

User Name: a421

Password: wua8ams

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