MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CMS.633: DIGITAL HUMANITIES

FOR DR. KURT FENDT & PROF. JAMES PARADIS

Art Annotator

The Art Annotation Platform (AAP)

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1 Concept Overview / Abstract

Our project aims to increase the value of a museum visitor's experience during their museum visits by enabling users to more readily engage in meaningful discussions about the pieces of art they view. Most musem visitors have little opportunity to record the many interesting impresssions they have as they view a contemporary museum exhibition. An individual may have a range of interesting thoughts and rich emotional responses as he or she views unique works of art, but these inevitably fade in memory and cannot be shared with friends and others.

We have created an easily hackable and scalable mobile web-platform where users can quickly annotate and read others comments about museum installations. Museum visitors experience a conflict between how they want to interact with museum pieces and the nature of museum environments. The museum is the best environment to capture and discuss pieces as you are in the midst of an entire surrounding gallery, however, one is expected to be quiet and courteous to those around you. Our tool allows for people to capture their viewing impressions and communicate with one another about the pieces they view, as well as to gain insight from comments that visitors have made in the past.

2 Background Research

The initial concept for the Art Annotation Platform was inspired from the Digital Humanities' group members' own personal experiences in museums, as well as our classs collective trip to the Museum of Fine Arts in Boston,

Massachusetts. We felt the strong desire to share our impressions and exchange views with other visitors, but wanted to be courteous of those around us.

In addition to filling this gap in the museum experience, our team understands that art museums face a challenge reaching some key demographics. To get a better sense of this issue, we looked to a study conducted by Reach Advisors, a predictive analytics firm focused on emerging shifts in the external landscape [Reach Advisors, 2012]. This group reached out to over 40,000 museum-visiting households by partnering with over 100 museums to find respondents through the museums mailing lists. They found that, in art museums specifically, 65% of those attending are over the age of 50, with females making up 60% of the visitor base. [Reach Advisors, 2010]. There is a large discrepancy between these statistics and the demographics of the US population, where only 30% are above the age of 50 and only 51% are female [U.S. Census, 2011].

To respond to this issue, our group made a tool that young persons would readily be able to use, so we chose to make Art Annotator primarily used through mobile devices. 'Millenials' are typically equipped with smartphones, and are well-aware of how to use them, so it seemed like a logical choice. However, making the AAP such that it's readily usable is not enough to solve the issue of balancing demographics. To encourage repeat visits to the museum, users would have to derive more value than they expected from their experience at the museum. To achieve these, we chose to include an anonymous commenting feature, for reasons we outline further in the **Project Development / Process** section of this document.

Our group reached out to Kristen Gresh of the Museum of Fine Arts to discuss the idea, and get feedback from someone who is intimately familiar with the needs of an art museum. Our discussion with Kristen led to an important realization about the a potential negative imapct of our project in museums. Certain implementations of the AAP, for instance when using QR codes in the museum, might be too intrusive in the museum and distract from the pieces themselves. Kristen related an anecdote where a group at the MFA was looking to make a particular exhibition interactive with visitors, and planned to use QR codes to achieve this [Gresh, 2014]. Ultimately, they were prevented from doing so by another department at the museum interested in preserving the focus on visual design of objects in exhibitions. We address this issue in-depth in the **Future Directions** section of this document.

3 Project Development / Process

After forming, our team looked at our individual strengths to identify which tasks could be done by particular persons so as to develop the project the most on a short time-scale. Both Megan and Evan had web development experience, whereas Fisher had none, so the division of labor was easy to make.

Megan Gebhard '17 worked to develop the backend of our web platform, meaning that she handled the databases used to store data about each art piece on the platform, as well as user registration details, and the storage for our commenting system. Megan was also involved in helping draft the initial

prototype and brainstorm ideas for features beyond the initial prototype.

Eric Fisher Jepsen '16 was involved in fully polishing our prototype so the team had a consistent and clear vision of the tool we were developing. In addition to this, Fisher conducted some background research to discover what similar tools might exist, and compiled some presentations given in class as well as the majority of the final design document.

Evan Moore '14 primarily implemented the frontend of our web platform, which is the part of our website that the end-user visually interacts with. Evan found web technologies that would assist with fully realizing our tool, and allow for us to focus less on the programming and coding aspect of the tool, and more so on its applications and real-world usage.

The initial brainstorming sessions in class resulted in several crudely sketched prototypes of Art Annotator. The most common issue of these prototypes was that too many buttons and features were being squeezed on to the webpage, which is typically fine for a desktop web-browsing experience, but ends up frustrating users of the mobile web.
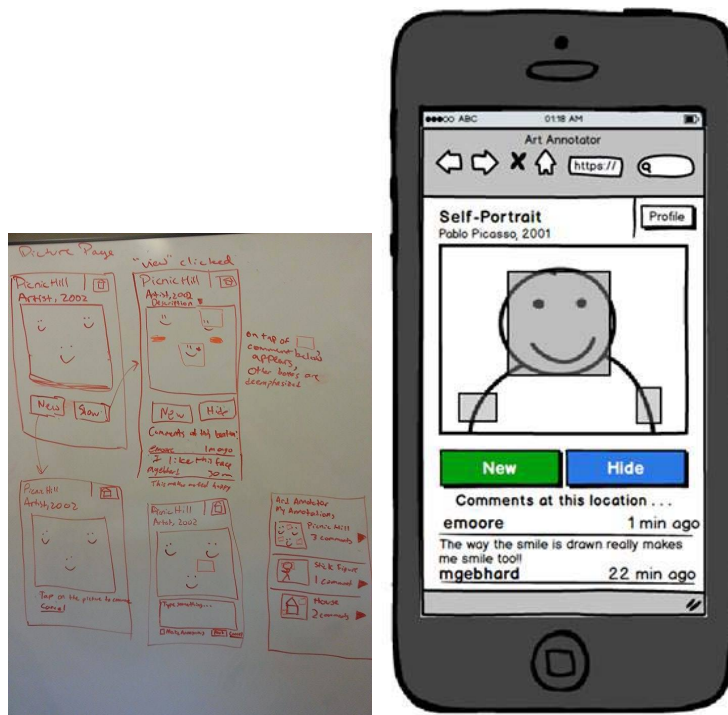
Figure 1: Both early and old prototypes (made with Balsamiq)

Outside of Digital Humanities, our group met multiple times to fully flesh out the details of our project. The first meeting primarily fixed the issues we had with our initial prototypes. The amount of features we intended to implement in our final prototype — such as a toggled 'heat map' overlay showing which areas of pieces were commented on most — was reduced to very near the bare minimum for showing the core functioning of the tool.

One feature beyond the core of Art Annotator that we chose to include is the ability for users to comment anonymously. This is because our audience includes museum visitors who are 'art newbies', and feel that they aren't able to create meaningful discussion about art pieces. Commenting anonymously

allows for users to throw their ideas out to the world without fear of being associated with or looked down upon for what they say.

In the last week, our group scraped more art and art metadata from the MFA website to use in our final prototype. Also, we made several changes to the design of the web interface to make it more aesthetically pleasing and allow users to more easily view descriptions of art pieces.
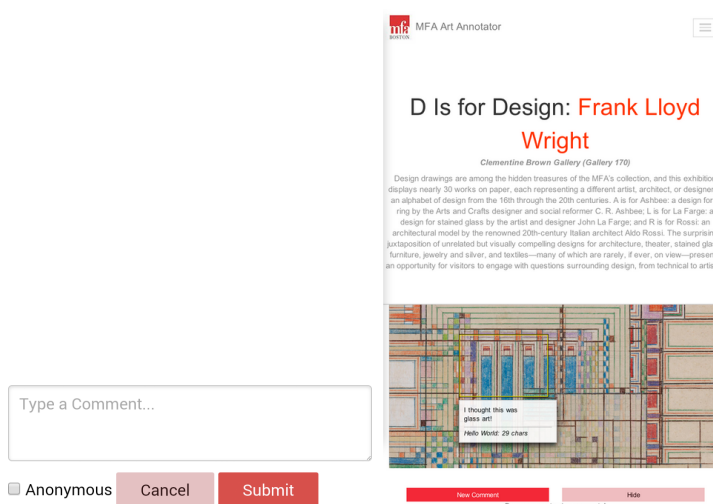

Figure 2: Anonymous commenting / Final design of art webpages

4   Enabling Technologies

While creating our prototype, our group wanted to be able to quickly make changes to the design so that we could easily explore new ideas in its implementation. To do this, we used Balsamiq Mockups, which is a desktop application typically used for rapid prototyping and wireframing. The advantage we had in using Balsamiq is that we could easily share files for the

prototypes between the group to make edits as needed, as well as utilize the built-in tools Balsamiq had for designing mobile-web applications.

On the front-end, the site was made using standard HTML/CSS/JavaScript, while also utilizing Annotorious. Annotorious is a JavaScript plugin that brings image annotation tools to web pages. With Annotorious, users can draw a rectangle around a part of the image and add a comment to that image. We found a similar use case for our application.

However, there were some quirks with Annotorious that called for modification of the plugin. For instance, the default functionality called for an editor that popped up right next to a square. We wanted our users to comment in a form below the image, so the code had to be adapted to supress the default editor and add the annotation programatically. In addition we had to augment annotations with additional metadata, such as whether or not the annotation was anonymous.

Furthermore, we had to download the Google App Engine Software Development Kit for Python. Google App Engine has a NDB data store where we created user, art and annotation databases. The website will be hosted by a Google domain (www.artannotator.appspot.com). This was essential to producing a website that can be accessed by anyone. Google App Engine is a fantastic web framework that allows us to host our website and store all the art data for our users.

Another tool that was essential in creating this platform was Github. First, it enabled us to share code remotely. We could adjust style, implement backend changes and make suggestions on how to improve the application. Secondly, it allowed for us to back up all our versions of the application

deployed. All in all, Github was helpful when coding the art annotation application.

Finally, we use QR codes as the means for the end-user to find the specific page they need in order to comment on the piece of art they are viewing. QR codes are read by the vast majority of smart phones, and are small and therefore not distracting, so we can place them in spaces adjacent to the art. They are also a clear visual cue to young persons that there is something in the web-realm on the other side of the scan. It made sense to use them as the means of accessing our tool from the museum.

5   Journey Map

We expect our tool to be installed in specific exhibitions, and not necessarily throughout an entire museum. As one views a piece of art, they may also notice a QR code placed next to the title of the art piece. Upon scanning, they will be brough to that piece's page on the Art Annotator website, and will be prompted to register or log in. From here, users can easily toggle to view a curator-provided description of the piece. **See: Figure 3**

Alternatively, users can click the 'Show' button to display transparent boxes over the artwork, indicating what areas of the piece other users have commented on. After highlighting one of the boxes, comments made about that location will display at the bottom of the page. **See: Figure 4**
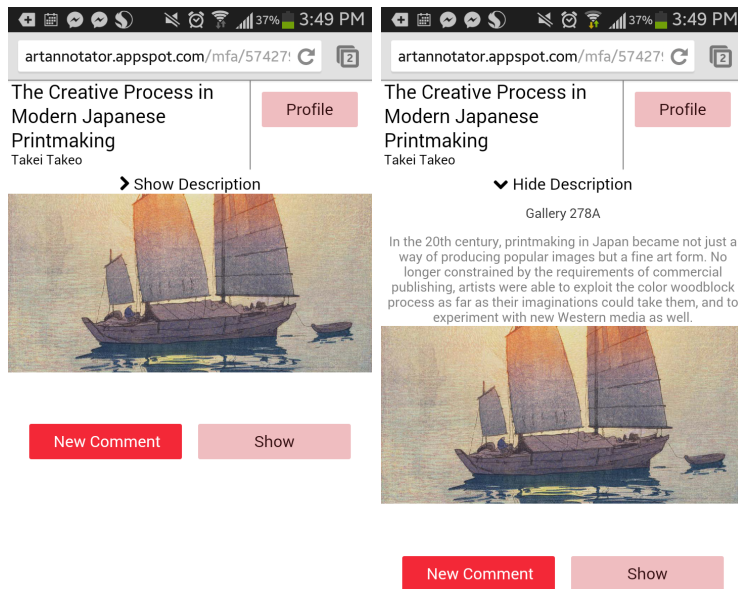
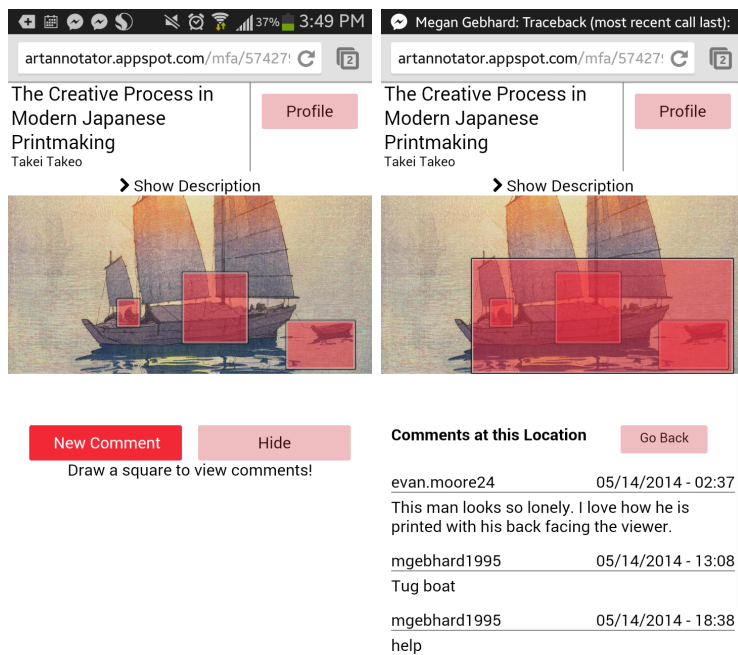Figure 3: A typical webpage, with and without descriptions

Figure 4: Before and after a user highlights one of the comment boxes

Users also have the ability to add their own comments. By clicking on 'New Comment', users are prompted to select the area of the art they would like to comment on. After selecting some region, users enter their comments in a text field before posting it to the public. In the figures below, one can see that there is a checkbox below the text field lablelled 'Anonymous'. Checking this box before posting a comment allows one to comment anonymously, preventing others from seeing the username associated with the comment made.
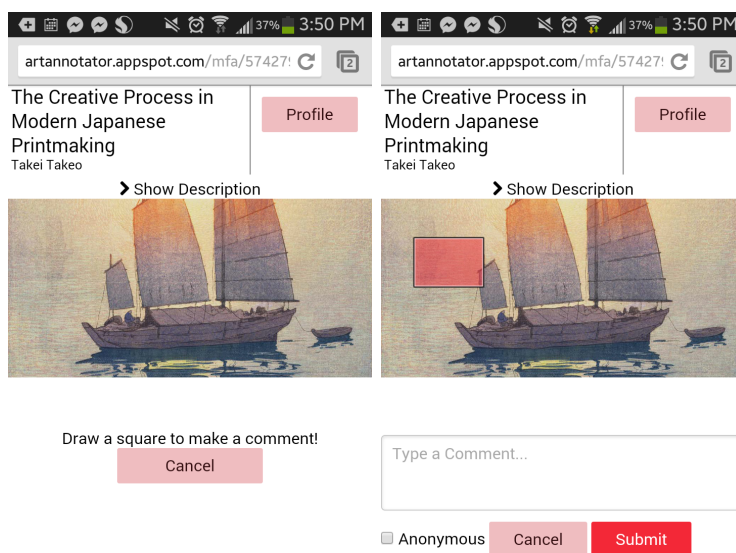

Figure 5: The typical commenting process

After leaving the museum, users are still able to interact with Art Annotator. By clicking on the 'Home' button in the top-right of any webpage, users are directed to a listing of all the pieces they have commented on. Here,

users are easily able to select pieces they would like to review their comments on, or look at comments new users have made.
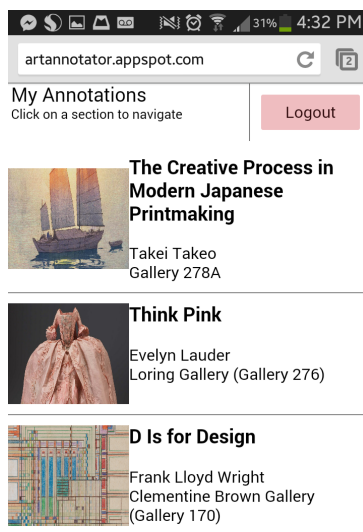

Figure 6: An example of a user's home/profile page

6   Future Directions

In the past several weeks, our group has only been able to flesh out the core of our idea. Many features were dropped, and the visual design of the prototype was not fully polished. Below, we detail what we would continue to work on given the potential to do so.

First, we would complete the addition of basic features that would be useful to a museum using Art Annotator. One such feature would be an 'administration' section of the tool. This would largely be used by curators

who are implementing Art Annotator in their exhibition, and it would allow them to easily add new pieces of art to the platform's database and create matching QR codes. Additionally, administrators would be able to act as a moderator and remove innapropriate comments made about pieces of art. Similarly, another useful feature would be that allowing users to 'flag' particular comments for deletion. Users might also want to rate particular comments they think are insightful, so an 'upvoting' system like that of Reddit would be straightforward to implement.

One issue raised in our discussion with Kristen Gresh is that QR codes might be too distracting and not work well with the visual design of the gallery. We thought of an alternative method of allowing users to access our applications, which would rely on users searching for pieces of art on the Art Annotator website. A museum might notify visitors before entering the gallery that the Art Annotator tool has been implemented in the gallery, and identifying features of each art piece (i.e. an ID number) would be printed below the descriptions typically adjacent to pieces in a gallery. Users would then search on Art Annotator with the ID number to be brought to the commenting page. This solution avoids much visual distraction.

Eventually, we would like to bring our Art Annotator outside of the mobile-realm. Implenting a more fully-featured desktop version of Art Annotator would allow for a more broad range of use cases. In particular, we think the ability for one to 'export' the comments they've made in a museum to a well-organized spreadsheet or PDF. Primarily, this would be used to share comments with another person in the real world, or use as a personal reminder.

Additionally, a feature like this has great use in the education field. After a class field trip to a museum, students would be able to export their comments and share them with the class, or send them to a teacher. This is an easy way for teachers to manage the visit, and determine if students completed their assignments/tasks of exploring the museum. Similarly, a feature where users could specify which groups they would like to share their comments with (Public, Class, Personal, etc.) like that of Annotation Studio [annotationstudio.mit.edu] would accomplish the same goals.

Ultimately, we see that there are a great deal of potential use cases for Art Annotator, and an even greater amount after modification has been made to the tool while working with groups that want to implement it. We look forward to exploring these new ideas, and seeing where others are able to help innovate on our idea.

References

[Reach Advisors, 2012] "About Us". *Reach Advisors*. Reach Advisors, LLC., 2012. Web. 4 May 2014.

[Reach Advisors, 2010] "Who's Coming to Your Museum? Demographics by Museum Type". *Reach Advisors*. Reach Advisors, LLC., 21 April 2010. Web. 2 May 2014.

[U.S. Census, 2011] "Age and Sex Composition: 2010". *U.S. Census Bureau*. U.S. Department of Commerce, May 2011. Page 2. Web PDF. 2 May 2014.

[Gresh, 2014] Gresh, Kristen. Personal interview. 13 May 2014.

A Balsamiq Prototypes

We've included the early prototypes we made with the Balsamiq Mockups
tool to more fully document how our project was developed.

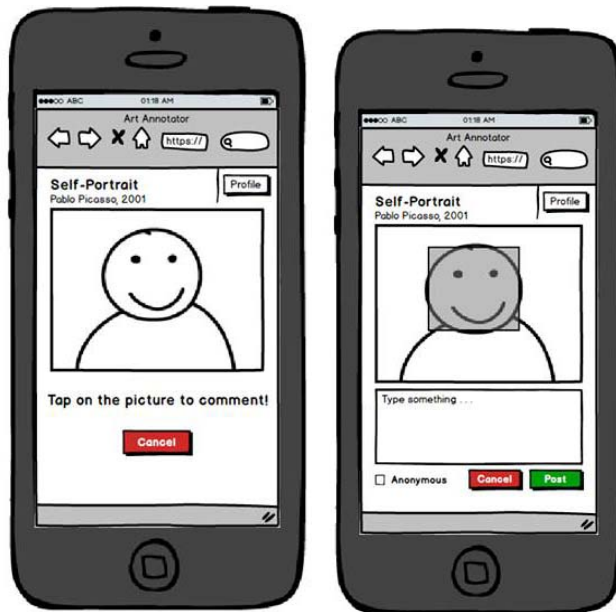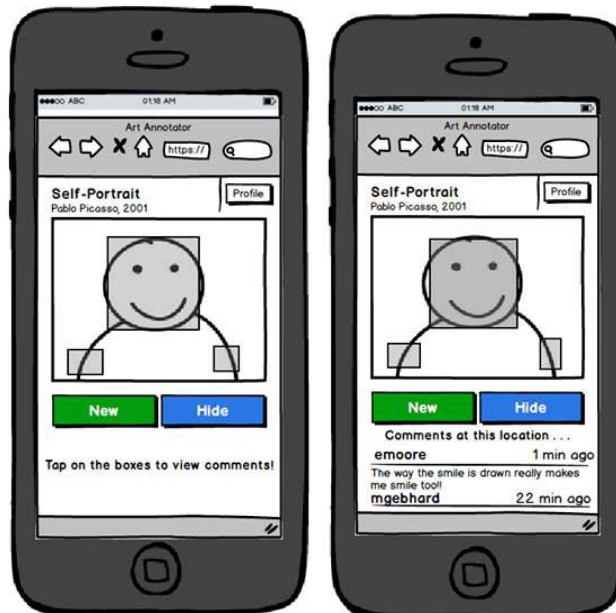Figure 7: The primary webpages of the platform: Art / Profile

Figure 8: The typical commenting process

Figure 9: The typical comment viewing process

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