Mobile Augmented Reality (AR) Design
Development Blog
Client: Rensselaer County Historical Society (RCHS)
Rensselaer Polytechnic Institute
Team Members:
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Dev Blog Post #1
March 12, 2014
Welcome to Team Interior's development blog for the AR Mobile Design COMM 6963 at Rensselaer Polytechnic Institute. This blog will document our team's progress throughout the class as we continue to plan and revise our project under Prof. Rouse's supervision.

Team Meeting 1 on March 19, 10am - 1pm at the RPI Student Union

- Review checklist for Midterm on Wednesday
- Update both Team Contract and Design Document
- Draft first blog post
- Planned our historical research methods
- Become familiarized with developer's tools GitHub, Wikitude, Eclipse, and Balsamiq

As outlined in our team contract, we maximize our time by reviewing our agenda from the previous meeting and assess our current progress.

Dev Blog Post #2
March 17 - 23, 2014
Our next team assignment is to create paper prototypes to present to Ms. Ilene Frank of the RCHS on Monday, March 24th. We had our team meeting in class this past Thursday with great communication between members.

Paper Prototype Process
The first decision our team had to make was to decide which social event we were going to adopt for the narrative of the application. After receiving feedback from Ms. Frank, we were given two candidates for our app:

- January 1850 Ball
- Beatrice Cluett's Coming Out Party in 1904

The RCHS has documentation on these parties to ensure the historical accuracy of our app. The RCHS is very concerned with historical accuracy, a requirement for ours and other groups' apps. In the end, we chose the January 1850 ball. Besides lying in a more remote past, this ball

provides an opportunity to highlight the family history in the house.

Our team met on March 22-23 and discussed the following points to address for our application:

- The 1850 ball was decided as the event we were to prototype on March 24
- Various food and drink were researched in order to have some historical elements within the mock-up
- Images of the dining room, parlor, and a specific hallway of the Hart-Cluett mansion were selected for the scenes to be reviewed by the head of the RCHS
- Individual lines of dialog were designed, allowing questions or answers to be added as the tester progressed through the prototype

We also communicate via Google Docs and Google Hangout, as well as email and texting.

Working with the Paper Prototype

We decided to use Balsamiq image designs for the Android smartphone template, actual photos taken during our Hart-Cluett House tour, question-answer dialogue boxes, and illustrated servant, maid, footman images. These images were present in our design document as embedded wireframes and prototype images that included actual photos in the hallway and dining room.

In preparation our paper prototype demonstration at the RCHS, we divided our responsibilities among the team members.

- Sebastian researched a total of six food items: food (x2), drink (x2) , & dessert (x2)
- Irene wrote dialogue trees for the butler/servant in the hallway
- Coley assisted Sebastian in his historical research on food in 1850 New York
- Leslie developed the model frames and other technical specifications

Leslie has industry experience with creating and demoing paper prototype and was able to foresee many of the problems we may have in constructing the prototype. She suggested using sticky notes to swap dialogue and content to the paper project, an example of why quick, interactive features are important to convey our ideas about the user experience. We realized that specifically for a paper prototype, for the most part it is more important to test the actual user interactions with the mockup phone and its paper pieces than actual content. For example, we worked diligently to research and write historically accurate questions and answers, but the test was really about if the user understood that touching on a user displayed a modal dialogue window (piece of paper) and that touching the "X" closed the window.

Paper Prototype Feedback

We received some important feedback on our prototype after our presentation that we believe will help improve the user experience with the app. The key points are as follows:

- The pictures we had of the Hart-Cluett mansion are too current, we should aim for finding a photograph of how it looked back then.
- Our idea of having a butler as a main character would be tough, since there is not much documentation on servants other than female maids.
- The conversation path with the characters in the project should allow for skipping dialog.

- Expenses and amounts of food, and general details at major events are documented, so we could find out what the Hart-Cluett actually ate at the event we are attempting to recreate.
- The interactive elements of our finished product could be in color, while the background would be black and white, giving users clues as to how to progress in the application.

The team felt that the feedback provided direction for us to improve user experience for our application. The RCHS is adamant about the historical accuracy of the content we we presenting for the user, so we are mindful or the meticulous research we will have to carry out for the project. This will include more trips to the RCHS for research and documentation. If we were to make another paper prototype, we would have better prepared our materials (i.e., having dialogue and content menus more organized and swap them more easily).

One observation we made is to let the user interact with the paper prototype with minimal instruction. We wanted Ms. Frank to handle the prototype, select commands, and record her observations. This is the advantage of having a material object to play with--it affords our team the opportunity to assess how intuitive our app is for new users. If the user is confused, then it means we have to reconsider how we are approaching the user experience.

Images from our Prototype Session with Ilene Frank, Executive Director, and Stacy Draper, Historian, of the RCHS, on March 24, 2014:
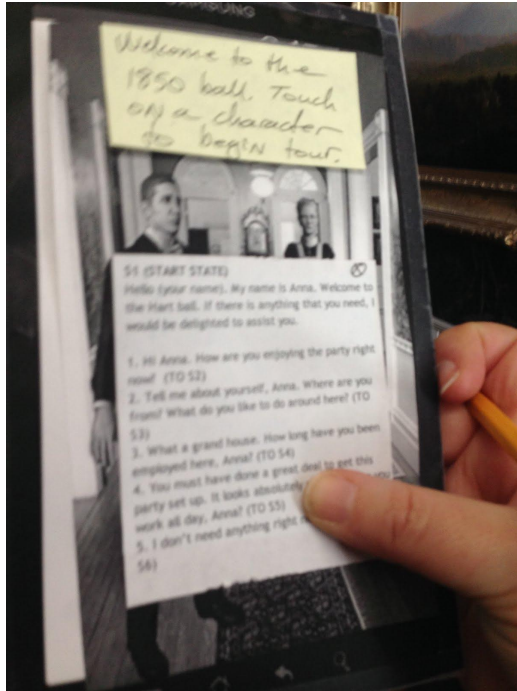
Next Steps for the Team
We have tentatively planned to do a RCHS Hart-Cluett house tour next Thursday, March 26, at 3pm with Ilene Frank. The purpose of the tour is to gather more historical information for our project. We will also be working on the progress report for Monday, March 31, as well as stitching together photographs of the Hart-Cluett house into panoramas.

Dev Blog Post #3
March 24 - 31, 2014
This week our team prepared for a project demonstration to be presented to RPI faculty on April 3. Our team has met twice in class, once for our weekly scheduled meeting, and for a historical research visit to the RCHS.

Notes from Meeting on March 26
On our second meeting, we updated our second blog post (March 17-23) to our developer's blog and discussed the work for the following week. Irene and Leslie are handling most of the technical challenges (i.e., coding and working with Wikitude) while Sebastian and Coley worked on content (i.e., historical research on food). We understand that we will need to carry out more research for this project: namely, we need more historical information regarding food, etiquette, and social life in the home for the mobile app.

With the help of Ilene, the RCHS director, our team decided upon a ball hosted by Ms. Hart in January 1850. First, the time is remote enough to emphasize the difference in contemporary lifestyles: Technology hadn't yet replaced the need for several servants to maintain the house. This is an opportunity for our team to bring attention to the family life in the house. Second, the

RCHS has plenty of historical documents (e.g., financial records) that can assist our team in creating a historically accurate user experience, which is one of the main aims of the RCHS.

RCHS Trip on March 27
To facilitate historical research, Leslie and Coley visited Ilene Frank at the RCHS in downtown Troy. Ilene was gracious enough to give us a private tour of the Marble House as well as answer all our questions about the house's history. She also gave us copies of some of the historical documents, such as bills and invoices that detail what was served that night in 1850. One of the records is a diary page from Maria Tilmen, the future daughter-in-law of Betsy Hart. Leslie also took more photographs of the house for our application.

Moving Forward with the Project
In class our team reviewed the remaining work left on the project as well as prepare for our demonstration to RPI faculty on April 3. Here are some of the issues we discussed:

- Use of image markers on the website or door of the RCHS to advertise the society
- Use of QR codes (e.g., a servant could tell the user information about the RCHS, such as the address)
- Use of QR code or target image use with paper invitations to advertise RCHS and maintain the app's narrative
- Play a video or demo of the AR app
- Add more historical information to the research archive
- Update the developers' blog post

The team also encountered an obstacle when one of the team members, Jason Coley, had to leave town for a week. Fortunately, our team planned for such extenuating circumstances in our scheduling and communication. Our team has been able to remain in contact with the member via email and chat features.

The Next Step
Our next milestone is the presentation of our augmented reality mobile application to RPI faculty on April 3. Our team will continue meeting and following our scheduled as planned.

Dev Blog Post #4
April 1- 8, 2014
This week we are preparing a presentation for a group of panelists, for Thursday 4/3. The panelists will include RPI professors from related departments. We have been developing a digital version of our paper prototype, with a focus on polishing our dialog and adding assets to the current version of the project.

April 2 Meeting Notes
- Character dialog was reviewed and revised
- Placeholder art will be used for the presentation, since they created character is not

presentable yet.
- Discussed using room images versus room elements for image markers, for the finished product. The demonstration will use the existing room images, for practical reasons.
- jQuery usefulness was debated, as well as how to implement the dialog tree.

Panelist Feedback on April 3
- There are too many dialog options presented to the user at once. We should limit this to two or three questions per dialog page.
- There should be a way to progress backwards in the dialog tree, so that the user can change their mind about the direction the conversation should go.
- Dialogue Q&A needs to be more brief, without the niceties of "hello yes it is a nice day" or similar. More direct questions and answers, especially given the small screen size for the text to limit hidden areas of the dialogue boxes.
- Include an explicit "Close" button or link for the dialogue windows, and enable a touch outside the window to close it.
- Change the character illustrations to look like they are from 1850, perhaps in sepia tone or black and white, instead of early 20th century. Our current figures are placeholders. The food items are accurate and directly from Ilene Frank of RCHS, so we will continue to use those.
- The servants and guests should have historical attire, instead of the modern attire of the placeholder art.
- Historically accurate phrasing would improve the conversations. Find out which famous, local people lived on Second Street (such as the Troy mayor) and include them in our app with interesting Q&A dialogue.
- Include audio for the dialogue, or given the limited time frame, a song that the band would play in 1850. Ilene Frank said they would have the Polka or Virginia Reel. I have found an .mp3 of the Virginia Reel and am looking at adding this to the Parlor room, where the dancing took place. I do not prefer sound so will look into a "Stop Music" button or link as well.
- We have the opportunity to tell things differently than the usual tour guide, so we should think outside the box.

Next Step
Refine what we have before the presentation: code, dialog, and images. We will take this a step further in preparation for Interactive Demo Day (4/9).

Dev Blog Post #5
April 9 - 15, 2014
This past week our team focused on presenting our project at the Interactive Demo Day at RPI on April 9. This demonstration was an opportunity to present our work to users and improve upon it with user feedback.

Notes from Monday, April 7
We only had one scheduled class before we demoed our project on the following Wednesday. In class we were able to discuss the following points:
- Make aesthetic choices for the characters (i.e., spectral vs. inked)
- Create dialogue flow chart

- Draft poster using template

Notes from April 9
Our team met a few hours before the setting our table up at the Interactive Demo Day event. Although we had a setback regarding dialogue, we were still able to deliver a working product for demonstration. We also received valuable user feedback:
- Consider taking different photos from different angles of the room (i.e., close-ups)
- Make a distinction between character's and user's dialogue
- One user recommended researching Photo Tourism's Photosynth, a 3D photograph sharing application; the software can stitch together images to make 3D panoramas.
- Representatives from local museums such as the Kate Mullany House expressed an interests for a similar app (contact information kept on file); the Burden Iron Works Museum was suggested as another museum that may be interested in our app

Code Status
Leslie spent the weekend working on the code using the Android SDK and GitHub repository. Significant changes include:
- Added a 20-second piece from the "Virginia Reel" at the beginning of the app launch, with fade-in and fade-out features. When the song finishes, an alert box provides information about the song's role in the ball that night, such as the location of where the 9-piece band played and where guests danced (info provided by Ilene Frank).
- The alert box also Includes an instruction on how to use the Mobile AR 1850 Ball application such as "Tap on the maid to begin…"
- Changed the app name to RCHS 1850 Ball from the placeholder name SDK Examples
- Swapped out character images from original, multicolored placeholders to black-and-white images
- Added food images from Ilene Frank, the director at RCHS, and people images from Sebastian with opacity and scaling attributes
- Added dialogue for food items, but with functionality concerns; avoided breaking existing character dialogues

The Next Step
With one team member out of town for a conference, the team has taken preparations to continue adding content to our Google Docs, GitHub, and development blog. Most of the work remaining is fine-tuning the user experience by revising dialogue and other historical information to the app. Our next scheduled meeting is in class on April 14.

Dev Blog Post #6
April 16 - 23, 2014
This week we we focused on polishing our app, to include revising dialogue and code.

Notes from April 14 class
- Sebastian will email Ilene Frank about images and hear her opinion
- Coley will email link of dialogue to Prof. rouse

Notes from April 16 meeting
- Leslie and Sebastian looked at the dialog tree, optimizing the order of the dialog options
- Sebastian emailed Ilene Frank to ask her about her opinion on the images
- Some improvements were also discovered, such as being able to go back to the main dialog options with a "Return to…" button
- Some dialog was moved to another character (Richard Hart now in the dining room), due to its subject being different from the rest of the dialog.
- The elements in each room were rearranged a bit, with most of the food information have been associated with the oysters/other in the drawing room

Next To-Do Steps:
- Sebastian will work on the drunk and look at converting the food photographs into artwork (ice desserts, oysters, champagne)
- Leslie and Irene will finish coding the dialog windows, and work on element scaling and transparency to change from 70% to 60%. If time permits, the dialog box will be altered to only cover half the screen.
- Irene will try to find a coding trigger in the Parlor to play the 20-second Virginia Reel audio when the user points the phone and the AR figures appear. If not possible, then we can provide a button to play the song with resulting dialogue explanation/questions/answers automatically opening when the song finishes.
- Will also work on implementing logic for character states so that the characters will be able to respond differently based on what the user has already done / whom they have already interacted with.
- Leslie will work on the dialogue interactions to not close the window after a user clicks on a question, but to "Return to…" the main dialogue for each room. Otherwise users would not have any menu but they might want to tap on other questions, so they have to tap on the AR figure again to make the menu reappear. They also can point their phone down and play with all the dialogue trees in one room (AR figures not needed on-screen to tap on Question/Answer dialogues).
- Jason will continue to work on altering the dialogues and adding new dialogues. Leslie will fill in info in the Google Docs while Jason is in Chicago (not set in stone, however).

Our team is meeting the RCHS downtown to present our materials and receive feedback from Ilene Frank, the director.

Dev Blog Post #7, Visit to RCHS in downtown Troy for Usability Testing
April 21, 2014
On Monday our team met at the RCHS in downtown Troy to demonstrate our project to the society's director, Ilene Frank and the museum's curator, Stacy Draper. Their feedback allows us to not only ensure that our historical content is accurate, but that the functionality of the app is intuitive and user-friendly.

Feedback from RCHS Visit on Monday, April 21, 2014

- The app had trouble tracking the images in the house, so we had to use printed images to complete the demonstration (will app work with other people in the way?).
- The maid would not do the cooking, so remove reference to cooking in dialogue.
- Champagne would have been brought into the sitting room, not served there.
- For object identification in the sitting room, we might consider a champagne glass or lady's fan.
- Some of the character's costumes are not appropriate for the time (e.g., Maria Tillman's and Richard Hart Jr.'s costumes).
- We might include a video of people dancing the "Virginia Reel" in the parlor, if we can find a historically accurate video from 1850 (perhaps a YouTube movie clip).
- We don't want to explicitly state that Billy Burden was drunk (we don't know for sure). Perhaps he was exuberant.
- Be more specific about the band's location (e.g., "between the dining room doors next to the staircase"). The band would have also played only until midnight, per contract.
- Betsy wouldn't have left the residence early because she was tired. She didn't have another place or relative's house to stay, unlike Amanda Cluett. It is likely she stayed until the last guest.
- Explicitly state that the oysters are from New York City. The preferred preparation was stewed oysters.
- We don't know for sure if Richard Hart was smoking in the bathroom the night of the fire; also, it would not have been kerosene, but some alcohol-based flammable.
- One functionality to consider is the ability to zoom in on the food bill to reveal greater detail.
- What information do we want to appear when the user closes the app? Information about the website? Perhaps visit the guest shop to buy the historical book.
- We might include information about the research documents (e.g., "based on original research from ten trunks full of financial and family papers found in the 1980s").
- Consider using a faux ball invitation to advertise the RCHS application and museum, to hand out in the gift shop. Consider how would a person know about the app, download it, and know what to do with it?
- Users had difficulty starting up the app and getting the intro dialogues to re-appear, without re-starting with the music playing repeatedly (especially Ilene). We need to allow them to re-open the intro dialogue in the hallway as well as the Virginia Reel and band dialogues in the parlor.

The Next Steps: Development and Graphic Design To-Do List as of April 23, 2014

The lists below outlines our next steps for polishing the app. These areas are largely divided among dialogue, graphic design, and coding.

Dialogue Text "Low-Hanging Fruit"

1. Intro - include information about the research documents (e.g., "based on original research from ten trunks full of financial and family papers found in the 1980s").
2. Change Drawing Room (another word for Parlor) to Sitting Room (also in code IDs)

3. Drawing Room - move champagne dialogues to here, from the Parlor. Keep the desserts dialogue info but modify for guests bringing to the drawing room.
4. Maid - remove mention of cooking duties
5. Parlor - Don't explicitly state that Billy Burden was drunk (we don't know for sure). Perhaps he was exuberant.
6. Parlor - incorporate Virginia Reel dialogues for Billy Burden
7. Parlor - State the band's location as "between the dining room doors next to the staircase" and that they would have played only until midnight, per contract.
8. Parlor late night - Remove reference to Betsy leaving early because she was tired.
9. Dining Room - Oysters are from New York City, and they were stewed oysters.
10. Dining Room - Richard Hart dying - Remove reference from cigar and kerosene to alcohol-based flammable
11. Richard Hart Jr. - change his occupation to "taking care of the family business" and expand on how his father had made his money in the War of 1812, etc. (it's in the museum book)
12. Confirm all dialogues historical accuracy with Stacy Draper of the RCHS

Graphic Design
1. Consider using a faux ball invitation to advertise the RCHS application and museum, to hand out in the gift shop. How would a person know about the app, download it, and know what to do with it?
2. For object identification in the sitting room, we might consider a champagne glass or lady's fan.
3. Some of the character's costumes are not appropriate for the time (e.g., Maria Tillman's and Richard Hart Jr.'s costumes). Stacy Draper emailed feedback to Sebastian regarding our current images.
4. ~~Try to find an 1850s video of people dancing the Virginia Reel - movie clip?~~ Not Doing

Coding / Development
1. Investigate geo-location image tracking instead of using a scan of an image to show AR figures
2. Test smaller target Point of Interest (POI) tracking in RCHS
3. Investigate adding a video, should be possible with Wikitude
4. ~~Can we zoom in on the food bill to reveal greater detail?~~ No.
5. Hallway - add a button to re-open the Intro dialogues.
6. ~~Parlor - add a button/musical note icon to play Virginia Reel.~~ Not Doing - dialogues now for Billy Burden

Closing the App Story
1. When user closes the app, include other Information. Prompt to visit the guest shop to buy the historical book, look at the RCHS website, etc.

Our next meeting is in class on Thursday. We plan on reviewing the To Do List and assigning those responsibilities to team members.

Dev Blog Post #8
April 24 - 30, 2014
Our team has spent the last week polishing our application for the final demonstration for May 5. This includes revising dialogue, selecting character images that are more historically accurate, and figuring out coding issues with GPS and target imaging.

Notes from April 24 Class
- Be prepared to present the project to many people at the RCHS on May 5; bring multiple devices
- Discussed alternatives to image tracking, such as using place markers and target images to activate app

Notes from April 28 Class
- Sebastian is finalizing the images we will use for the app. Previous images where
- Coley made dialogue revisions as recommend by Stacy Draper (see "Revised Dialogue for App" on Google Doc); send revision to Prof. Rouse
- Irene and Leslie are working on coding tasks to update the code. These will reflect the revised dialogues per Stacy Draper's feedback
- Leslie created an Organizational Flowchart which maps the dialogues to each room and character or food/drink item that appear

The Next Step
- Work on making a video for Thursday to demo the app
- Draft an invitation card that doubles as a advertisement

Our next class meeting on Monday will be at the RCHS in downtown Troy. There we will demo our latest prototype for constructive feedback.

Dev Blog Post #9
May 1-7, 2014
This is Team Interior's final post for the Ball of 1850 App. In it we detail our most recent visit to the RCHS to demo our app on site, as well as receive feedback from Ms. Ilene Frank, Director of the RCHS and Ms. Stacy Draper, the curator for the Marble House.

In addition to communicating via online, we have also met as a team in scheduled meetings or in class. Our last team meeting was held on May 1.

Notes from May 1 Class
- Sebastian worked on refining the characters and food items for the final app version
- Leslie and Irene worked on polishing the code and changing the graphic images for Sebastian's new ones, ready for the demo on Monday, May 5

- Coley revised the advertisement (i.e. the ball invitation and promo postcard) and worked on last minute dialogue revisions

Feedback from Ilene Frank and Stacy Draper, RCHS demo on May 5
- Make the app "Next Steps" clearer to the user when they have finished with the dialogue in one room and should proceed to another room
- Sound plays an important role in the AR experience, so make sure it compliments the visuals (we feel that ours does with the Virginia Reel song playing twice)
- RCHS also underscored the importance of doing thorough research (i.e., ensuring facts, dates, etc. are accurate)
- Note how language directs users to the next step: "Now continue to the next room and look for X"

The Next Step
After the demonstration at the RCHS, we recorded a short video of our app in use at the Marble House. This video has been uploaded to our Google Drive. Our team is working on the remaining documents due by 11:59 p.m. Wednesday night:
- Peer Review
- Individual Feedback
- Final Project with the four (minimum) required links

This is our last development blog post for our Mobile AR Design project for our client, the Rensselaer County Historical Society (RCHS).

Conclusion
Our professor and the RCHS client staff have given feedback that based on our working, native mobile app, we are the team whose product is most likely to be chosen for actual museum implementation.

This project was a competitive proposal situation with two other teams, and ours was the only Augmented Reality App that was completed for the client as fully functional, stable, and whose iterative designs most closely matched their conceptual model needs.