Campus Sherpa

Christopher Ford
cjford@mit.edu

Ganesh Ajjanagadde
gajjang@mit.edu

Harihar Subramanyam
hsubrama@mit.edu

James Thomas
jjthomas@mit.edu

ABSTRACT
In this paper, we outline the development and motivation for Campus Sherpa, a mobile application that allows users to make and take custom tours of the MIT campus. Our initial field study indicated that the tourist experience at MIT left something to be desired. Our field evaluation, conducted after the development of our application, showed us that our Campus Sherpa was perfectly suited to improve upon the tour taking experience at MIT. (TODO: INCORPORATE FIELD STUDY RESULTS HERE)

Author Keywords
Geolocations; campus; tours; location tracking; tourism; campus; sharing

INTRODUCTION
Our domain of interest is tourism, more specifically, tourism at MIT. The MIT campus is filled with plenty of sights to see and plenty of people to visit them. The goal of this application is to pair people with the places they want to see.

MIT receives a number of visitors each day from various demographics - prospective undergraduates/graduates, tourists visiting Boston/Cambridge, professionals or researchers attending a conference on campus, middle school students enrolled in Splash, etc. Many of these visitors will take a campus tour which will take them to the main sights at MIT (ex. the Student Center, gymnasium, auditorium, main hallway, and architecturally impressive computer science laboratory). However, this one-size-fits-all nature of the tour fails to take into account the interests of each visitor and show them all the sights that they would enjoy seeing. Primary research questions include: "How can we fix this with an easy to use mobile application?", "Is a mobile application the right way to solve this problem?", and "How can we take advantage of modern cell phone technologies to make the use of our application as easy as possible?"

The goal of this application is to allow users to pursue a tour (likely after the main campus tour) which will help them make the most of their time at MIT. For instance, a prospective graduate student in Biology would follow a tour of the biology labs while a tourist interested in history would be taken to the most historically important sites at MIT.

Since smartphones offer location awareness and mobility, they are the obvious platform choice for this application. By deploying this application for iOS, users can take out their smartphone when they arrive at MIT, select a tour based on their interest, and then begin exploring sites that will be most useful to them.

The second aspect of this application is to allow users to chronicle their tours and share them with others. As prospective students compare MIT to other schools or as tourists reminisce about their visit to MIT, the ability to record their tours (by associating locations with text, photos, videos, and links to related content) will aid them in remembering. For current students, this offers a way to record the precious memories they make at MIT and share them with others.

Thus, the primary audience will be people who aim to tour MIT and record their experience there. The secondary audience will be current MIT students who would like to chronicle their lives at MIT. While some MIT tours will be preinstalled, the majority should be user-created.

Based on our own experiences and the results of our interviews, people have varied tastes and desired destinations when visiting MIT, and we aim to make sure that their trip to MIT is as enjoyable and productive as possible. By creating an application to let users create, share, and follow custom tours of MIT, we hope to make college tours custom fit to each persons taste, to make memories of MIT easy to record and share, and to make a platform for sharing tours.

RELATED WORKS
There exist a number of products and applications aimed at making tour taking more exciting and enjoyable. Interactive exhibits at museums and college campuses aim to improve upon the tour taking experience by allowing tour takers to interact with what they are touring. These interactive kiosks often serve many tourists at once, and fail to provide a custom tailored experience to each user. Often, these interactive stations can get bogged down with traffic, resulting in long wait times which only frustrates the tourist.

There exist a few mobile applications that try to enrich tourism as well. Applications in this domain fall into two

main categories: applications that try to replace the tour taking experience all together, and applications that try to supplement existing tours. Applications in the first category include the Library of Congress Virtual Tour, Canadian Museum of Civilization, and American Museum of Natural History mobile applications. Although these virtual tours allow more users to "explore" a tourist destination, they fail to replicate the experience of touring in person. A 3.5" to 5" screen is not a good way to replicate a tour.

Applications that try to supplement existing tours include: the Boston Freedom Tail, Walking Cinema: Murder on Beacon Hill, and LAT Star Walk mobile applications. These applications do take in the users position so they can serve them content when they reach specific locations, but they lack the ability to create and share custom tours made by other users. With these applications, users are limited to the content made by the developers. While these applications usually only provide users with information specific to one tour, Campus Sherpa allows users to browse and take many tours of MIT, as created by other users.

TODO: ADD ACADEMIC RELATED WORKS

BACKGROUND

Motivated by the above observation, we first identified the types of people touring MIT. We decided that for the purposes of campus tours, we can broadly classify people as current students, prospective freshmen, parents, and tourists. In order to gather information about these groups, we conducted a survey of these four groups, with some questions common to all four groups and some tailored to a specific group. We reached out to tour groups, classmates/colleagues, and friends/family. Each participant was interviewed for approximately 15 to 20 minutes. Here are some of the questions we asked:

Everyone:

- What is the most memorable site you've visited here? Why?
- What is the one thing you most wish to see here? Why?
- Have you gone on a tour of MIT?
    1. Are there any questions the tour guide didn't answer?
    2. Did the tour take you everywhere you wanted?
    3. Did the tour leave out any place you wanted to see?

Current Students:

- What are three things you looked for when touring MIT?
- What is one place that the tour didn't cover, which you think tourists should see?

Prospective Freshman:

- If you could ask a current student one question about MIT, what would it be?
- What aspect of MIT do you want explore the most?

Parents:

- What are three places you want to tour at MIT that you think your child might not want to?
- If you could ask a current student one question about MIT, what would it be?

Tourists:

- How long will you be visiting MIT?
- In a sentence, why did you want to come visit MIT?

Approximately twenty people responded to the survey, evenly distributed across the four demographics. Some of the responses to the survey are:

"There are always too many things to see . . . I am wishing I can see more later" (current student)

"Campus Preview Weekend (CPW) was really rushed, and I did not get to see everything" (prospective freshman)

"I wish I could get a better sense of MIT culture. The tour guide briefly touched on how each dorm was different, but did not go into detail. " (prospective freshman)

"I wish they had shown us where the students hang out " (parent)

"I wish I could get a better sense of MIT culture. The tour guide briefly touched on how each dorm is different, but didn't go into detail. " (tourist)

From the above responses, we saw that a common complaint was that people were not able to visit places they wanted to with the regular campus tours. In order to solve this problem, we proposed an application that helps create and share custom tours of the MIT campus called "Campus Sherpa".

Since smartphones offer location awareness and mobility, they are the obvious platform choice for "Campus Sherpa". By deploying this application for iOS, users can take out their smartphone when they arrive at MIT, select a tour based on their interest, and then begin exploring sites that will be most useful to them.

The second aspect of "Campus Sherpa" that we wished to support is to allow users to chronicle their tours and share them with others. As prospective students compare MIT to other schools or as tourists reminisce about their visit to MIT, the ability to record their tours (by associating locations with text, photos, videos, and links to related content) will aid them in remembering. For current students, this offers a way to record the precious memories they make at MIT and share them with others. Thus, the primary audience will be people who aim to tour MIT and record their experience there. The secondary audience will be current MIT students who would like to chronicle their lives at MIT.

While some MIT tours will be pre-installed, the majority should be user-created. Based on our own experiences and the responses to our survey, people have varied tastes and desired destinations when visiting MIT, and we aimed to make sure that their trip to MIT is as enjoyable and productive as possible.

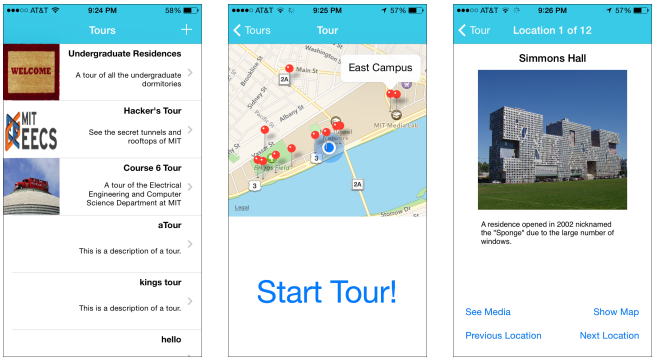

Figure 1. The screens of Campus Sherpa. (a) shows the tour browsing screen, where users can search for tours. (b) shows the tour preview screen, where users can preview the locations on the tour. (c) shows the location screen, where users can read about a locations and access associated media.

By creating an application to let users create, share, and follow custom tours of MIT, we hope to make college tours custom fit to each person's taste, to make memories of MIT easy to record and share, and to make a platform for sharing tours.

SYSTEM DESCRIPTION

"Campus Sherpa" allows users to achieve two goals:

- Take custom tours
- Create tours based on experiences.

When users launch the application, they are presented with a screen (Figure 1a) that lists all tours that have been created (by any user). If they would like to take a tour, they can select one from the list, and they will be directed to a "Start Tour" page (Figure 1b), which includes a map of all of the locations on the tour. If any of the location pins are clicked, the name of the corresponding location is shown.

Once the user starts a tour, they are presented with a screen for the first location. The screen contains a picture of the location, two buttons for navigating to the previous location and the next location, another button that brings up a map with all of the locations (the same map from Figure 1b), and a final button that shows a list of media items associated with the current location (Figure 1c).

Technical Details

We use Parse for the backend. Parse is a backend-as-a-service which provides an SDK for iOS which allows users to persist objects on the server. This is much simpler than building a backend from scratch. For this project, we persist and retrieve latitude/longitude, text, pictures, and audio - which Parse supports. Since this application does not run in a browser, we do not have any browser dependencies (TODO: EXPAND THIS)

FIELD STUDY

¡¡¡¡¡¡¡ HEAD For our field study, we decided to combine quantitative and qualitative analysis of Campus Sherpa's user experience. For each user, we tracked which screens were viewed most often, which buttons were pressed most frequently, and for how much time a particular screen was viewed for. This gave us a sense of what our users were interacting with, or getting stuck on, from a quantitative perspective.

We also kept a detailed log of how we observed our users interacting with Campus Sherpa. We observed and noted body language and facial expression and did our best to map both positive and negative interactions with our application to specific screens.

Additionally, we surveyed users after they tried our application to get some of their feedback as well. User feedback, combined with qualitative observations, and quantitative data gave us a detailed look into how well Campus Sherpa worked for our users.

Since our app is targeted at tourists of MIT, a demographic we did not have ready access to, we primarily focused on gathering information from two more available groups: iOS experts, who could critique the user experience of the app, and recent prefrosh (current MIT freshmen), who could asses the app's utility for prospective students. We had 4 students from each group take one tour (a brief tour of some locations in the Infinite Corridor) and make one tour, and we took notes on any difficulties they seemed to be experiencing while using the app. After they finished both tasks, we asked them for any feedback they had. We used a few standard questions:

- What additional features might it be useful for this app to have?
- Was any part of the user experience awkward or difficult?
- Do you see this app being useful in its current form to prospective tourists? What advantages would it have over tour guide-led tours?

We received a large volume of feedback. Some of the most common responses and insights follow:

- The "Show Map" screen (visible when taking a tour, looks much like Figure **??**) should have shown the pin for the current location in a different color.
- The keyboard on many screens was hard to dismiss – the iOS experts suggested converting many of the views to ScrollViews so that users could scroll down to see elements obscured by a keyboard.
- If one location has a picture and the subsequent location does not (when taking a tour), the subsequent location's picture is set to the first location's picture, causing confusion.
- The workflow for the make tour portion of the app was a bit confusing – the "Publish Tour" button appeared too early, so users sometimes clicked it before adding any locations to the tour.
- It would be nice if the app provided users directions to get one from one location to the next.

We modified the app to address the most common concerns of the testers. An interesting use case we discovered from running the field study is that many users actually like to step through tours in the app without actually moving physically from place to place. Thus, our app could prove incredibly useful to prospective students who are unable to visit the campus but want a sense for the rich variety of locations and sights at MIT. This use case could also help people plan what places they would like to visit during a trip to MIT. In essence, the app, if populated with a sufficient number of user-generated tours, could serve as a catalog of all of the interesting sets of related locations on campus. ¿¿¿¿¿¿¿ Some work on the field study portion

After they tested the app, the testers were asked to fill out a brief survey consisting of the following questions, with responses being ratings on a 1-to-5 scale:

- How useful do you think this app would have been for you during CPW?, with 1 being "Don't think tours would have played a big role in my decision, or tour guide-led tours would have been more than enough" and 5 being "Seeing different parts of campus would have been crucial to my decision, and this app would have helped me with that"

- As a current MIT student, could you see yourself using this app to explore different parts of campus when you had some free time?, with 1 being "Not at all" and 5 being "Definitely"

- Could you see this app being useful to tourists who want to get a better sense of MIT?, with 1 being "No, there are much better ways to do this" and 5 being "Yes, this app could offer much more information than tour guide-led tours or other options"

With the second question we explored yet another use case – the physical tour for people who are already familiar with MIT in general but might want to explore a very niche part of campus. For example, there could be a tour with destinations popular for "hacking," which might include the roofs of various buildings and instructions on how to reach them. The results of this survey are plotted in Figure **??**.

DISCUSSION

Prepare your submissions on a word processor or typesetter. Please note that page layout may change slightly depending upon the printer you have specified. LaTeX sometimes will create overfull lines that extend into columns. To attempt to combat this, the .cls file has a command, \sloppy, that essentially asks LaTeX to prefer underfull lines with extra whitespace. For more details on this, and info on how to control it more finely, check out **http://www.economics.utoronto.ca/osborne/latex/PMAKEUP.HTM**.

Future Work

TODO: ADD FUTURE WORK

Conslusion

TODO: ADD CONCLUSION

ACKNOWLEDGMENTS

We thank the participants of our studies and exercises for their time and effort, as well as for allowing us to use their thoughts and comments in both this paper, and in the development process of Campus Sherpa.

We also thank Ed Barrett, Frank Bentley, and Jason Martin Lipshin and the entire 21W.789 staff for their continued support and advice. Without them, Campus Sherpa would not have been possible.

REFERENCES