UPark

Real-time access to your parking

Final Specification Document

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PROBLEM SPACE

The problem space that our team is focusing on is the transition of getting used to, and learning how to park on campus. Our product would enable users to quickly find parking spots on and around campus, and if possible, around the greater Seattle area. We believe that our product is needed because Seattle is getting increasingly over-populated considering the number of people who have moved here in recent years. Because some of our team members used to commute to Seattle to attend classes at the University of Washington (UW), we have observed the increasing number of people in Seattle represented in the form of the driving/commuting populace.

The parking lots here at the University of Washington fill up early in the morning before most classes even begin. We believe our experience in being late to class, work, or other priorities due to parking issues is an experience that a majority of the commuting populace here at UW can relate to. The context in which our design will exist is in the form of a mobile application and an associating smart meter that will be initially used by commuters who drive from a certain city in Washington to the University District in Seattle. The users of such an application and smart meter would have information on what parking spaces/lots are open near or on campus. Right now campus parking can be very confusing.

There are different lots, with different rules, different times, and different rates. There are even certain streets that have their own rules. Our plan is to simplify the parking plan on campus. In order to design something to fix this we will have to get some questions answered. We need to find out: peoples parking routines, what confuses them, when they need parking, where they need parking, how they pay, why, and how often they need parking. We can get these questions answered by asking the users. Luckily for us they will be easy to find. Anyone walking back to their car in a campus parking lot is a user that we can try to ask some of these questions to.

OUR AUDIENCE

We will be designing for the students/faculty members, and anyone who commutes from their home cities. As UW students, we know and understand the struggle for student commuters to find parking before class begins. The users in this sort of persona would typically be at least seventeen years of age and they would be UW students who commute, are stuck in traffic, and need help finding parking spaces before their lecture or work begins. This application is designed for UW professors and faculty members considering the fact that a majority of UW professors live off-campus. We would like to ask our fellow commuter friends if they would have liked an application like this for their personal use in the years that they had commuted; furthermore, we will ask these users if they would actually use this application.

We are designing for a diverse group of people that require parking on campus. This ranges from students, to professors, to anyone who is just visiting. We will be able to identify our users by those who are walking back to their cars. We plan on doing this as opposed to talking to them when they are leaving their car because people are usually in a rush on their way to campus. We can build relationships with our users because we all have personal experience in this field. We might share some of their frustrations, and be able to talk about how we've had the same issues before. We would like to ask our users where, how long, how often, and for what reason they are parking. Once we know that we want to know what issues they have had. Were they confused picking a spot? Did they understand the timing and charges?

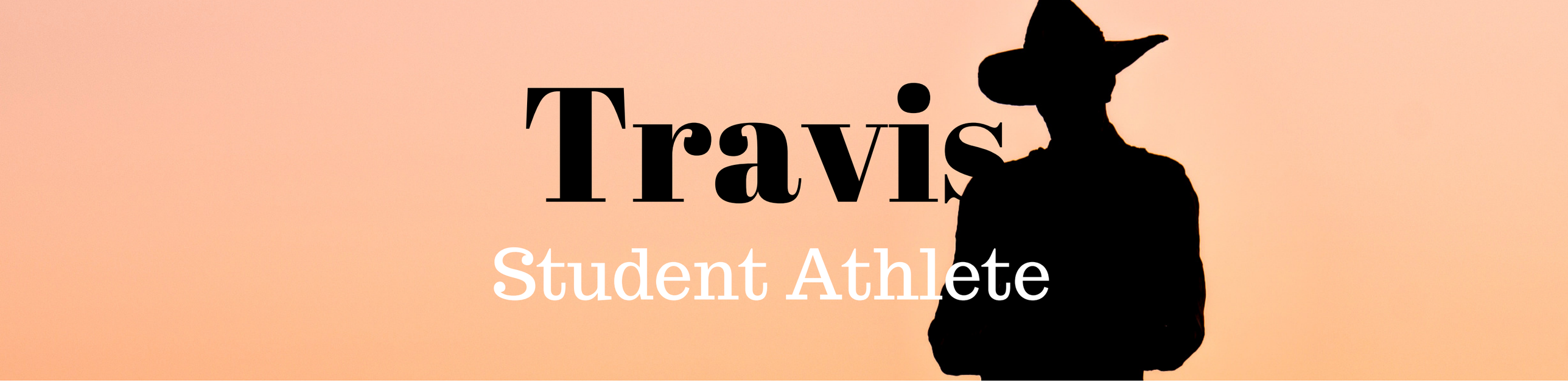
OUR PERSONA

Travis
Student Athlete

Jonathan
Business man

Amy
Graduate Student &
Dental assistant

Sean
Young Professional



USER STORY

There is a parking meter that is center to many different personas. The parking meter is next to a building called Conibear, some tennis courts, a lake, the IMA, and all of the University of Washington's athletic facilities. The parking lot has about 40 spaces, and there is only the one parking meter. The parking meter has options to pay by change, cash, or credit card. It also has three options, long term (paying by the week, or month), daily, and by the minute. Travis is a student athlete at the University of Washington. Every morning he has to drive from his house to football. Three times a day, he has to drive to another building named Conibear for meals. Each time at the building he has to stay for 15 - 45 minutes to eat. Conibear is within walking distance from his football parking lot but, he thinks driving is worth it.

USER NEEDS

Cheap parking Quick parking To be able to park in the same spot multiple times a day To not get a parking ticket

USER SCENARIOS

Travis just got out of practice. He has class in one hour. Instead of driving to Conibear, he walks from the stadium, and goes straight past the parking meter. He does not need to use it. Travis just got out of practice. He has class in two hours. He decides to drive to Conibear and spend some time eating lunch. When he goes to the machine, he looks through his pockets and finds enough change to pay for about 30 minutes, which he then uses it all and enters the building. Travis spends 40 minutes eating and returns to his car. Luckily, he did not get a ticket. Travis is driving to practice in the morning. Instead of going to the stadium first, he parks at Conibear. He is required to get breakfast, but is running short on time. He parks, runs past the parking meter and eats as quickly as he can. He sprints out of the building back to his car and speeds on his way to the stadium.

User Story

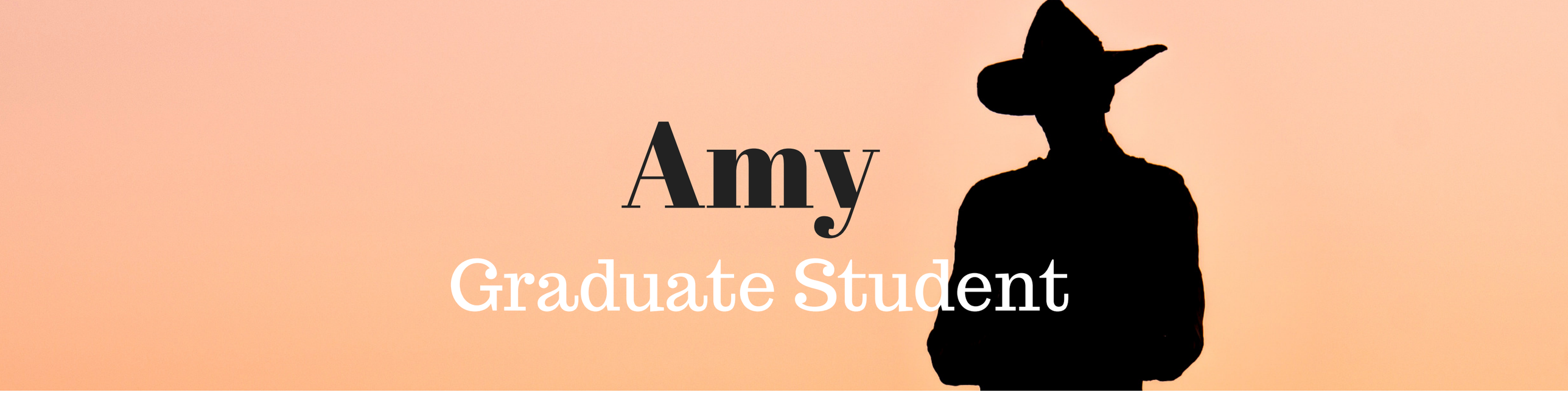
Jonathan is an elder, very active man. Many years ago, his friends and him spent time together on a regular basis boating, hiking, and adventuring. Now that they are older, they like to stay in touch. A few times a week, Jonathan comes to play tennis with his friends. They all drive separately and meet at the tennis courts around 7 AM. Jonathan likes to play tennis for two to three hours at a time. He usually meets with his friends to do this around 4 times a week. He does not like technology, and carries cash instead of a credit card.

User Needs

Over 2-3 hours of parking at a time A simple user friendly interface that is easy to read, and interact with Would like to be able to pay once, not every day To see his friends, doesn't want to be held up by a machine

User Scenarios

Jonathan heads out early in the morning to meet his friends. When he arrives, he sees that they are already on the courts and he is eager to see them. After parking, he enters his coins before selecting his parking spot and they spit out from the bottom. He picks them up and starts over. His friends notice him and are greeting him with hello. After correctly selecting his parking spot, and then entering coins, he sets himself up with 3 hours of time all from a heavy pocket full of quarters. He goes and plays tennis and leaves after 2 hours and 45 minutes. Johnathan arrives to the parking lot at the same time as one of his friends. They both walk up to pay at the machine but there is a confused international student in front of them. They chat as the student figures out the parking process with her many friends. Then Jonathan goes first. He is haggled by his friend who has upgraded to a credit card. His friend shows him how much easier it is to use but Jonathan is resilient, enters his change as usual, and makes a remark toward the government. Slightly annoyed by waiting for the student, and his friends nagging, he is in a bad mood and only stays for 1 hour of his 3 that he paid for.



User Story

Amy is a 25 year old college graduate. She is working as a dental assistant. She likes to stay in shape. Since she has work, she usually goes to a spin class early in the morning. However, every once in a while she likes to go somewhere that she can go on an actual run with friends. While she was in college, she ran track and cross country and learned of jogging paths she really enjoys near Lake Washington. She spontaneously likes to drive down there to go on her runs.

User Needs

Random amounts of time for parking, anywhere from 1 to 5 hours
To be able to pay with her credit card because she never has pockets for change

User Scenarios

Amy has the day off and decides to go for a morning run. Since she has the day off work her normal routine is all thrown off. She goes at a time that is not normal and get stuck in traffic. It takes her much longer to get to her favorite running spot. Once she gets there she realizes she forgot her credit card, she can't pay for parking. She runs a quicker loop than normal taking about one hour. She gets back and has a ticket. Amy has work today, but woke up early and has enough time to go for a run. She drives to the parking lot, pays for one hour, runs back to her car puts everything away, and tucks her car key in her sock. She goes for a run taking about one hour but there are a lot more cars in the lot and she doesn't remember where she parked. It takes her 5 minutes to find her car. Amy has work today and wants to squeeze in a run. She drives to the parking lot and goes to pay but the football team just got out of meetings and there is a long line at the only parking meter. She patiently waits in line, when it's her turn to pay she realizes she wasted half the time she had to run waiting in line. She now pays for half the time she normally would have and goes on half the run.

User Story

Sean is a young professor who also is very into his health and fitness. Before work every day, he likes to go to the IMA early in the morning to work out and stay in shape. He likes to go very early when his students are not there. Sean is a very routine-oriented guy that likes to stick to his daily process, and he needs to park in this parking lot every morning because it is in central proximity to both the gym and work.

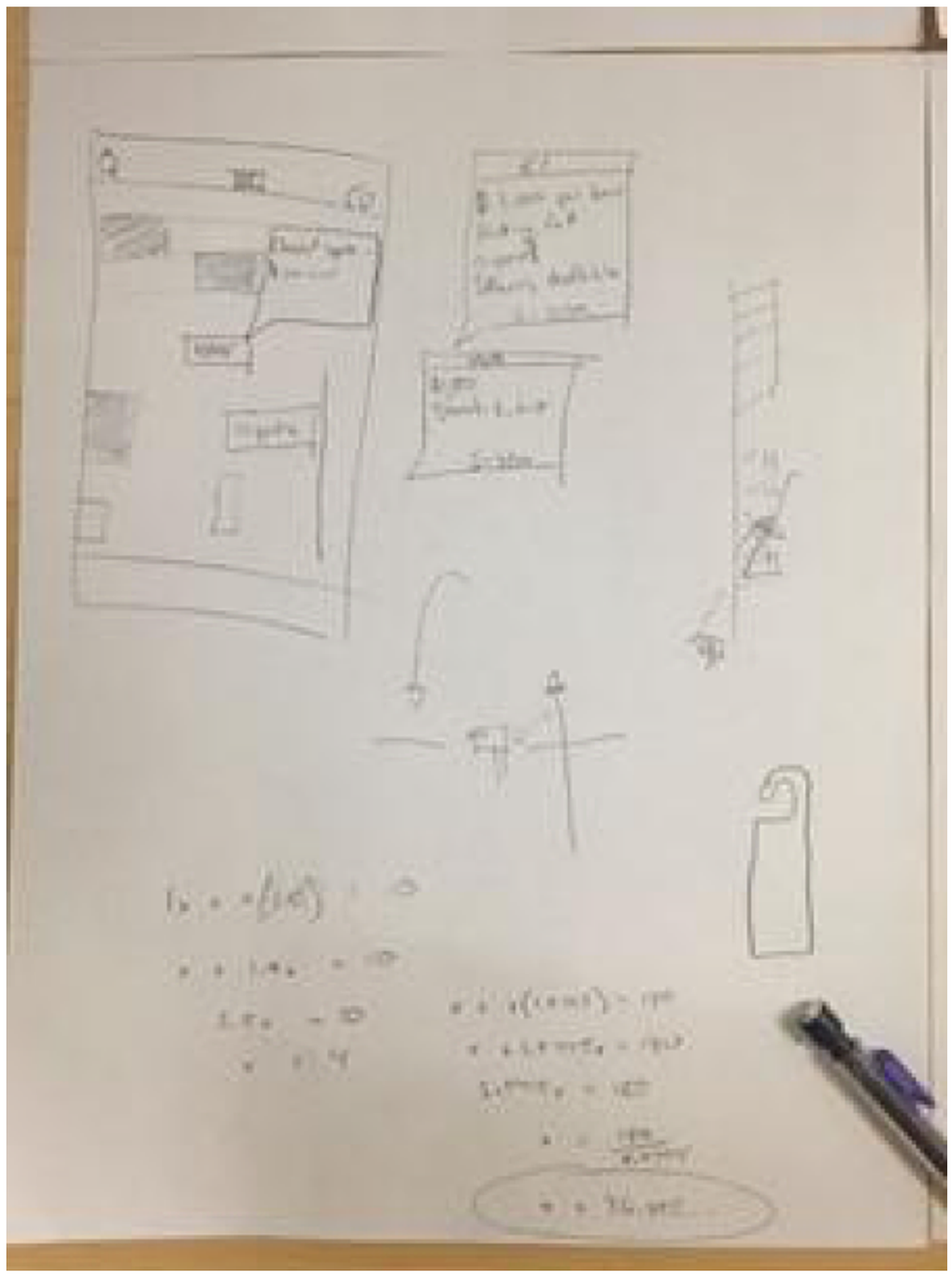
User Needs

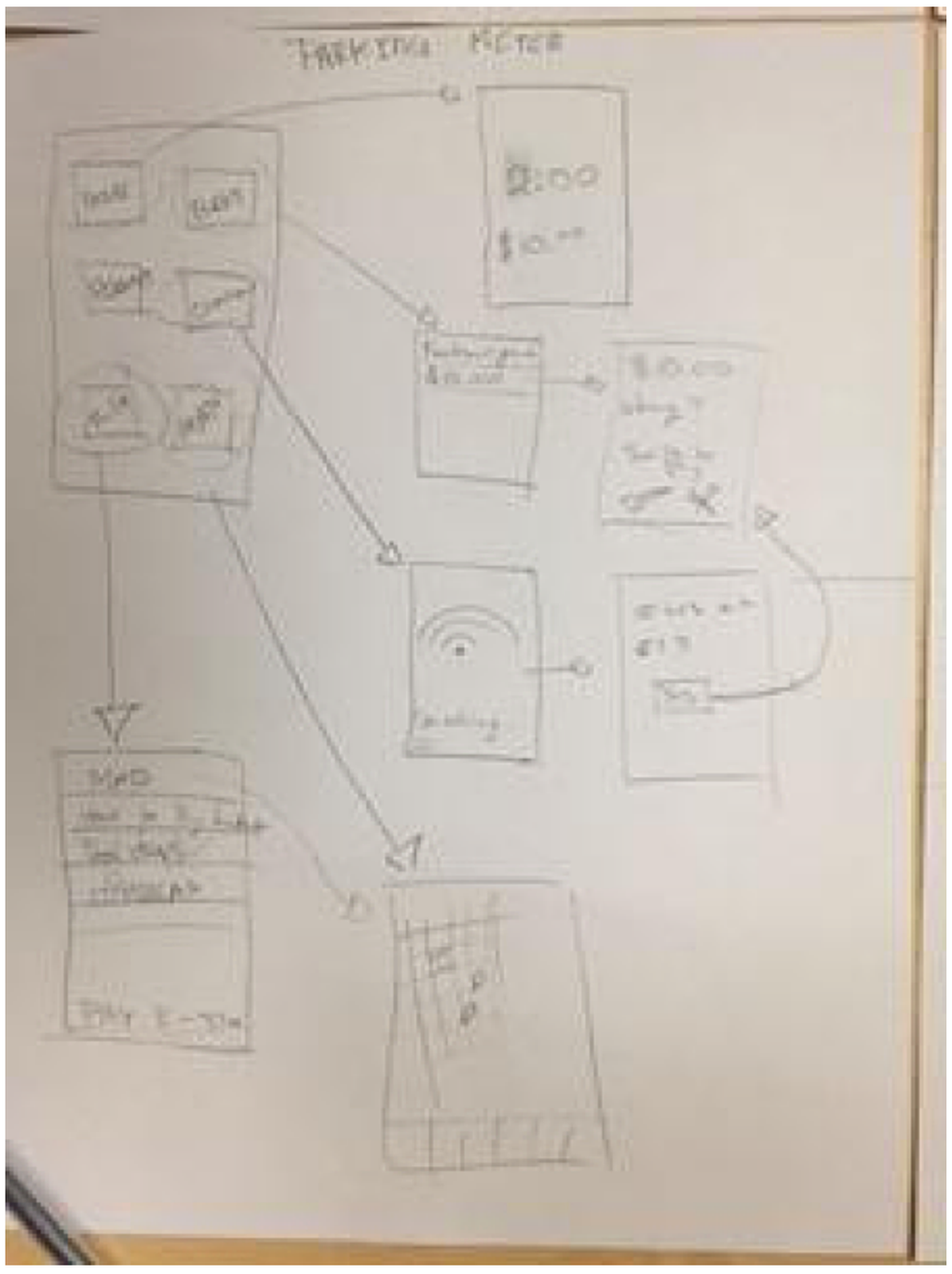
A plan to pay for parking everyday Doesn't want to waste time at the machine To be recognized as a regular user Parking 5 days a week, over 8 hours a day

User Scenarios

Sean arrives early in the morning and hangs his parking permit on his windshield. He walks past the parking meter to the IMA to work out, and then leaves from there to work. He is on campus all day and returns to his car at night, and everything went as it should. Sean arrives early, but doesn’t know where his parking pass is. He has to pay for parking for the day. Frustrated, he walks to the parking meter. He looks through the different parking options, and selects the one for all day parking, which costs him $30 dollars and he is upset because he is already paying for it with his permit. He now has to figure out how to order a new permit that he has misplaced.

Design Details and Rationale

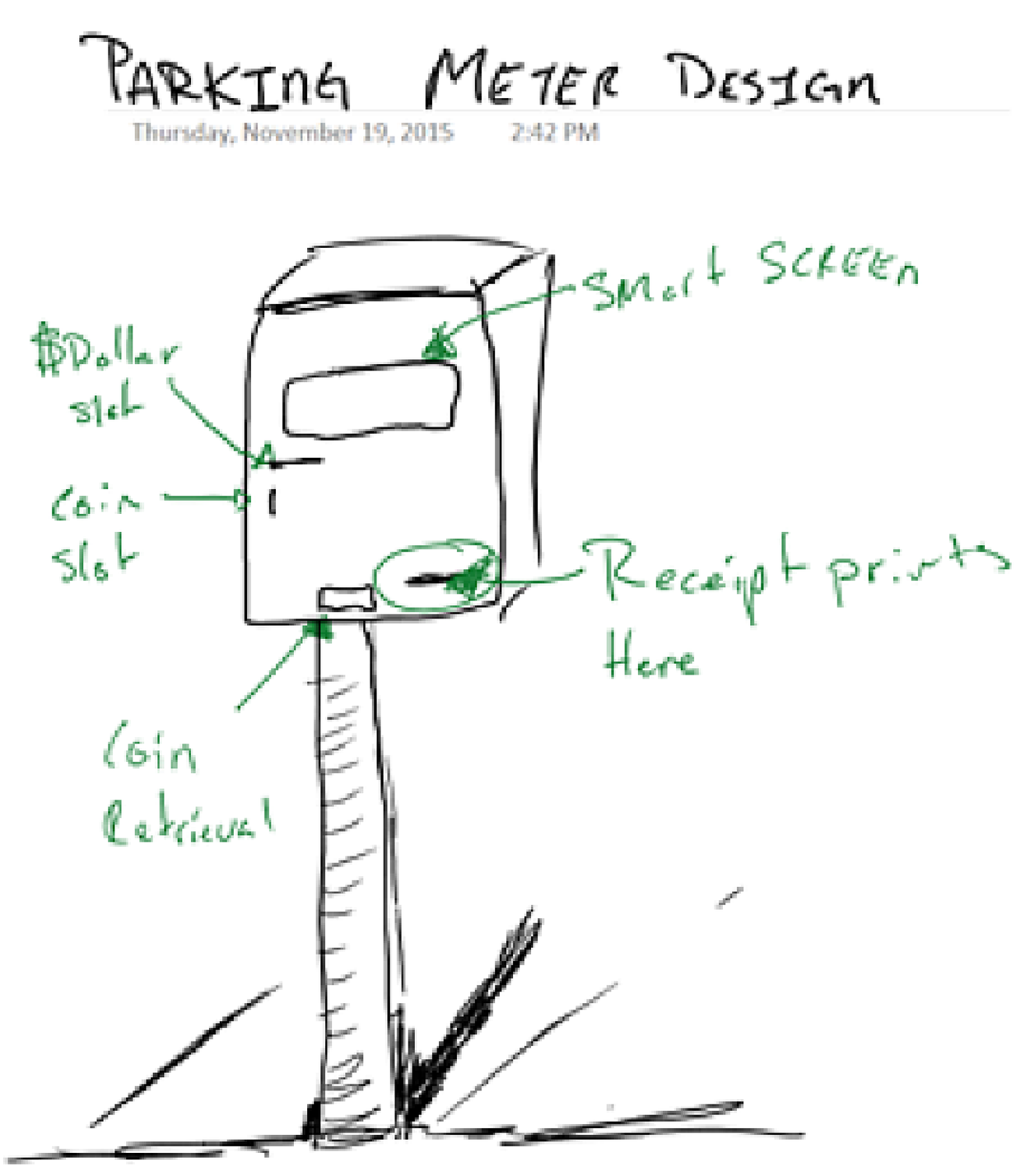




The U-Park application will look like any other regular application that runs on smart phones right now. The application would have a login screen to verify that the user is a UW student/commuter. It would have a digital component that displays the parking lots that have parking spaces available near or on the University of Washington grounds in U-Park. However, the user can still use the application as a guest without sign-up or log-in. A physical requirement that this application will possess is the smart meter. The last thing this application would physically require, besides users, is an administrator to look over this kind of parking system and application.

Design Details and Rationale

The rationale for these requirements is that all these components in the system serve a purpose. The application U-Park and the smart meters will constitute a literal check to see what parking spaces are available, and they will inform the users and parking personnel of when a parking spot is available, which will benefit the commuting populace/users in their transitions from driving to safe and efficient parking. The administrator is required because this system at first would not be self-governing.



The parking meter will look similar to the parking meters we have now except the screen will replace the majority of the buttons. It will have a pole that is cemented into the ground, a slot for printing, a slot for coins, money storage, a coin return, a cash reader, and the interactive touch screen. The storage for money will be in the lower left half, with the printing and storage of paper, and stickers in the lower right.

Design Details and Rationale

U-Park's application interface would include the options to navigate from parking lots or spaces to another parking lot or space on campus. The user can sign-up as a UW student in order to sync the application with smart parking meter or the user can simply use the application as a guest without logging in. This would be in the form of a filter search engine in which the user can type in the destination that they are going and once user presses the go button, it will navigate the user to the nearest parking meter and parking lot. The interface would also include a map of the University of Washington's campus and a little bit of University District as a whole. The user can choose different filters to decide what to be showed on the map such as buildings, parking meters, or parking lots

Design Details and Rationale

Also, when the user clicks on a building, parking meter, or parking lot, it will give you more detailed information about the place such as hourly parking rates and free parking hours. U-Park will have an “info” button that the user can click on in order to assist them with parking needs. The info button will also contain information on what would happen if you receive a parking ticket or a fine, and it will also include factual data about the conditions of the parking lot(s).

The information screen will have information and features such as FAQ, buying a parking permit, information about different permits, paying a tickets, etc. The parking application will have a variety of different screens. Home screen, map screen, search screen, and information screen. Map screen will have different filters to decide what to be colored on the map such as buildings, parking meters and parking lots. Also, if you click on building, parking meter, or parking lot, it will give you a detailed information about the place. The search screen will have sections that take user input in order to find the most efficient parking lot for the user.

Evaluation and user testing

Our initial evaluation is structured to analyze whether the parking experience and situations for commuters in the Greater Seattle area have improved from using U-Park. We have evaluated the application's efficiency in terms of how quickly and swiftly it provides users with information. After that, we evaluated the user interface to see if all the physical and digital components of our system were running correctly, and then we evaluated the overall user experience from the users. These findings enabled our team to further improve and polish the delivery of efficient parking options to the users of U-Park.

The users of this application now have information on what parking spaces/lots are open near or on campus. A list of questions we have had answered in order to confirm this belief are the following: how often do users use parking on campus, what users' biggest problems are faced with when parking on campus, what users like about current parking meters, whether users have ever gotten a parking ticket, and whether users were aware of different parking options prior to using our application.

Three design questions that have helped our team control the scope of our work is the following:

1. What would users like to see implemented in this parking application that would help them park their cars in a timely and efficient manner?

2. How can information on parking be readily available to the commuting populace?

3. What solutions can this application further provide commuters if smart meters indicate parking spaces are completely full?

Evaluation and user testing

The primary goal of our team's design is to see if a project like this would be feasible and beneficial to the greater commuting populace. Findings in enlightened user feedback about their experience have confirmed that this application was helpful for commuters. Another primary goal was to finish implementing our work on a prototype that can accommodate for all components that are inside of what may be a larger system. We have also completed this using Invision (prototyping software). The last primary goal was to get our list of design questions answered to reinforce the problem statement/space and we wanted to ask users of our application (the stakeholders) the list of questions we have listed in the preceding paragraphs so that we can incorporate their feedback in the development of this application. We have ensured that these goals have been met based on meeting with the stakeholders of this application, and asking them for constant feedback on whether or not the problem space in the transition could have been made easier.

The behavioral mapping is a form of systematic observation research that tracks and records behavior/behavioral patterns over (1) space and (2) time. The assessment of these two conditions in the study contribute to the success of an application like our group's parking application because tracking a particular place (like a Seattle parking lot/space) and tracking a user's movements would allow the application to guide focus groups (users) to a variety of parking options more efficiently. The way behavioral mapping works is that it consists of techniques that fulfill the goals of my application through implementing place-centered and individual-centered mapping. Behavioral mapping allows researchers like my team to determine how participants use a designed space by recording participant behaviors (the users) to better inform the development of my team's application by improving the underlying patterns of participant behavior associated to driving and parking.

Evaluation and user testing

We have deployed behavioral mapping in our user testing by initially assessing the length of time it takes for a person driving from their house to the University of Washington's central campus. We tracked any factors that expedited their travel, and we also analyzed if there were any factors that increase the length of the users' commute. We then compared the assessment of the regular commuter to assessing someone who used U-Park. Given the same factors and variables from the initial testing, we looked to see if the person using our team's parking application is able to expedite the length of their commute by finding available parking spaces in a timely and efficient fashion. Finally, we tracked the geo-locations of the available parking spaces and "smart-meters" relative to where the driver was coming from so that the application informed the driver of parking spaces that were relatively close to them. We then concluded the deployment of this method in our testing by running multiple trial-and-error assessments of our application to reinforce the credibility of our findings.

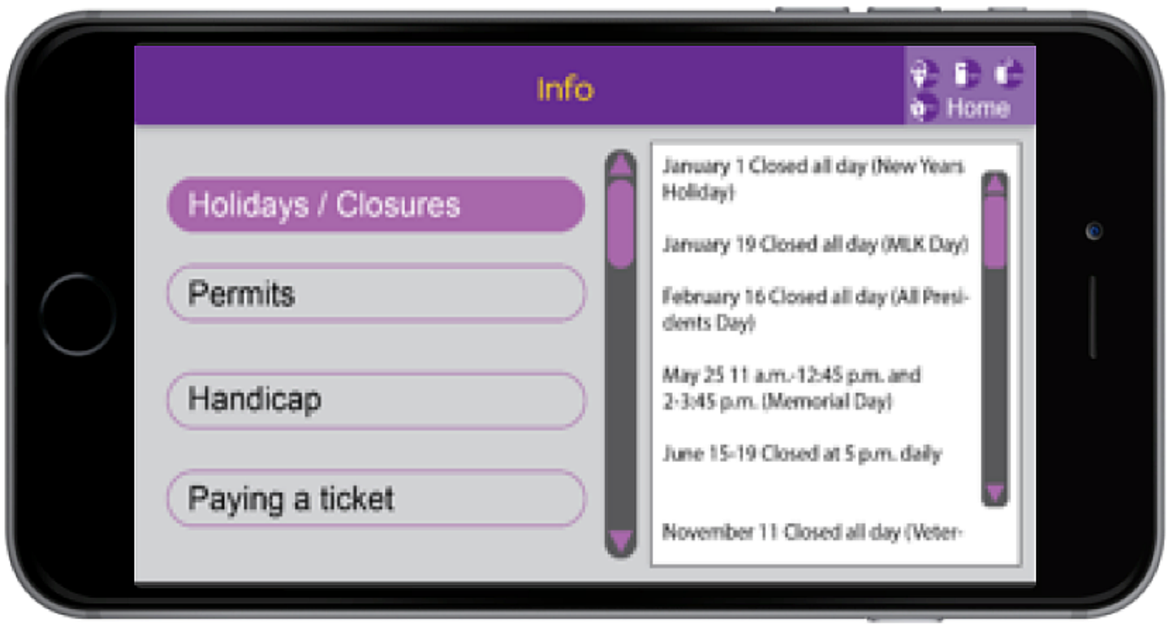
The data we have collected using this method was both qualitative and quantitative statistical data. The qualitative data mapped out the underlying behavioral trends in how commuters got to Seattle from their house to park their cars safely in available parking spaces, which constitutes our initial design space. The qualitative data represented that the burden of commuting has been somewhat removed from the average commuter who initially struggled to find parking. The quantitative data was represented in the number of parking spaces open, smart meters that are functioning normally and assisting in this parking system, the number of personnel overlooking the smart meters and parking lots, and the geo-locations of the people driving and where parking spaces were available.

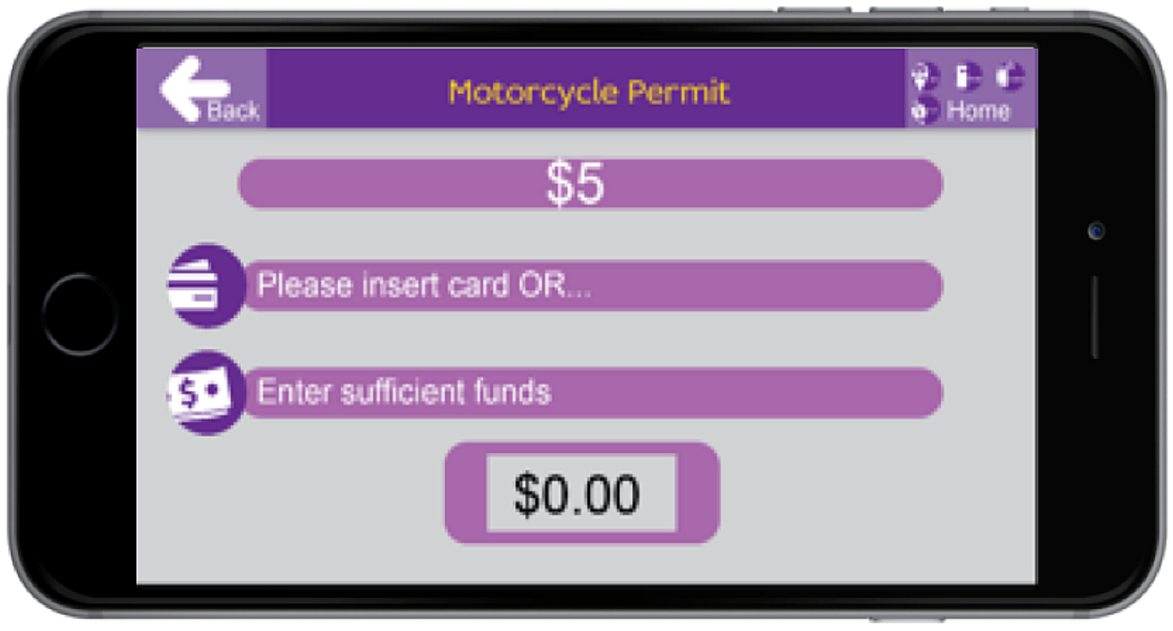
Graphic design and layout

The main theme that we use in our parking application “U-Park” is University of Washington since the purpose of the application is designed to help people parking on UW’s campus. In designing the application we wanted to make it as useful as possible. We thought of it as a parking meter and an information booth in your pocket. On the app you should be familiar with your phones interface. You can check on the time of your parking, and even add time. We included an account creation page. This page helps syncing the meter to your phone seamless. It takes your license plate number, and when you pay from the park it will automatically apply it to that car.

When we were designing our parking app we found a few things to be the key components. The map was a huge source of where our information comes from. Users will be able to use our filters to display exactly what they are looking for on the map. On the map page we wanted as much screen real estate as possible to be available. We reduced the opacity of the bars to create more space for the map. We also wanted the layout to include large buttons for ease of use with an unfamiliar device. It needed to be very clear with large font, and also able to display whatever information a user needs onto their current screen. It was also important to us to keep the simplicity of a current parking meter for simple payments.

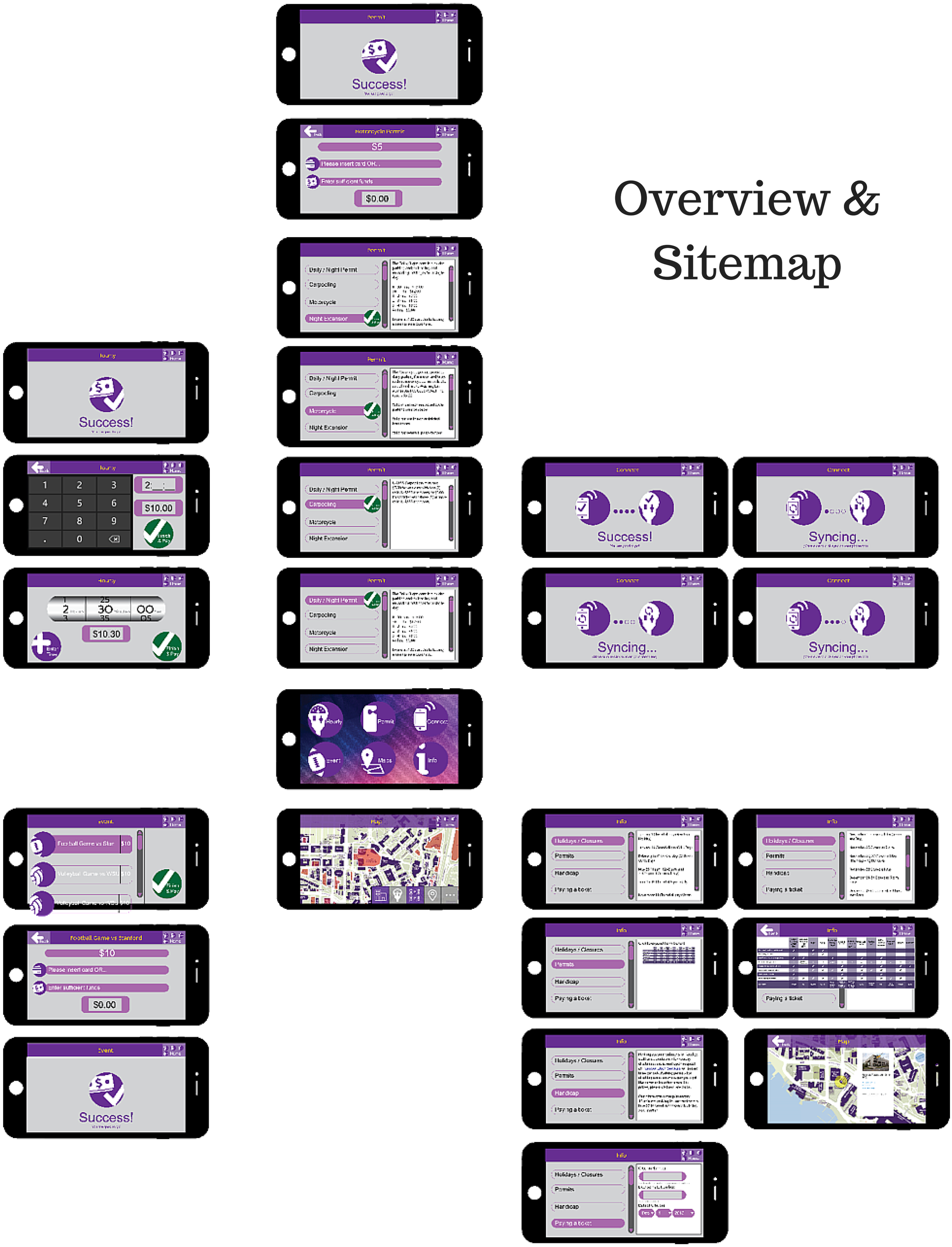
Graphic design and layout





Graphic design and layout

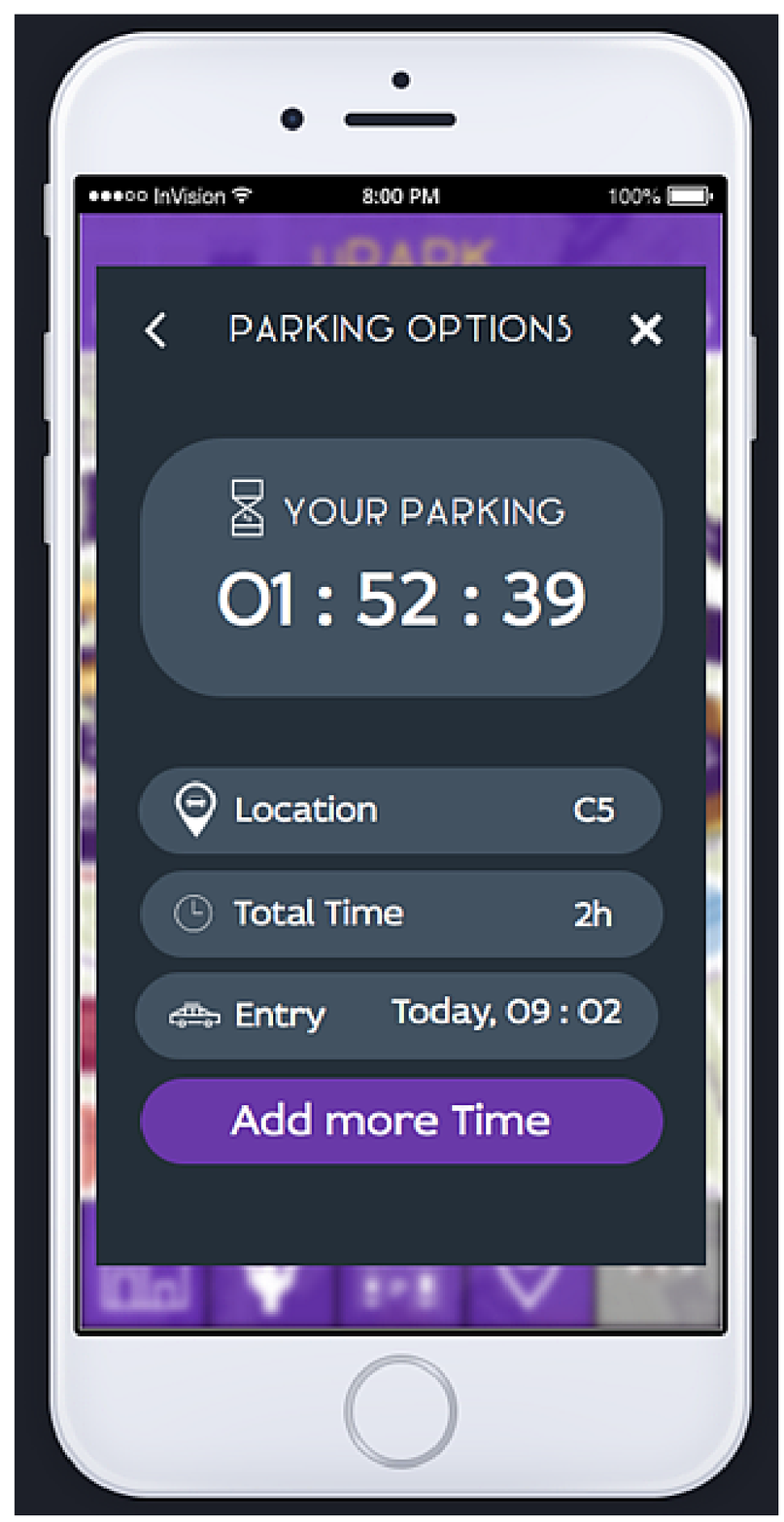
Overview & Sitemap



Graphic design and layout

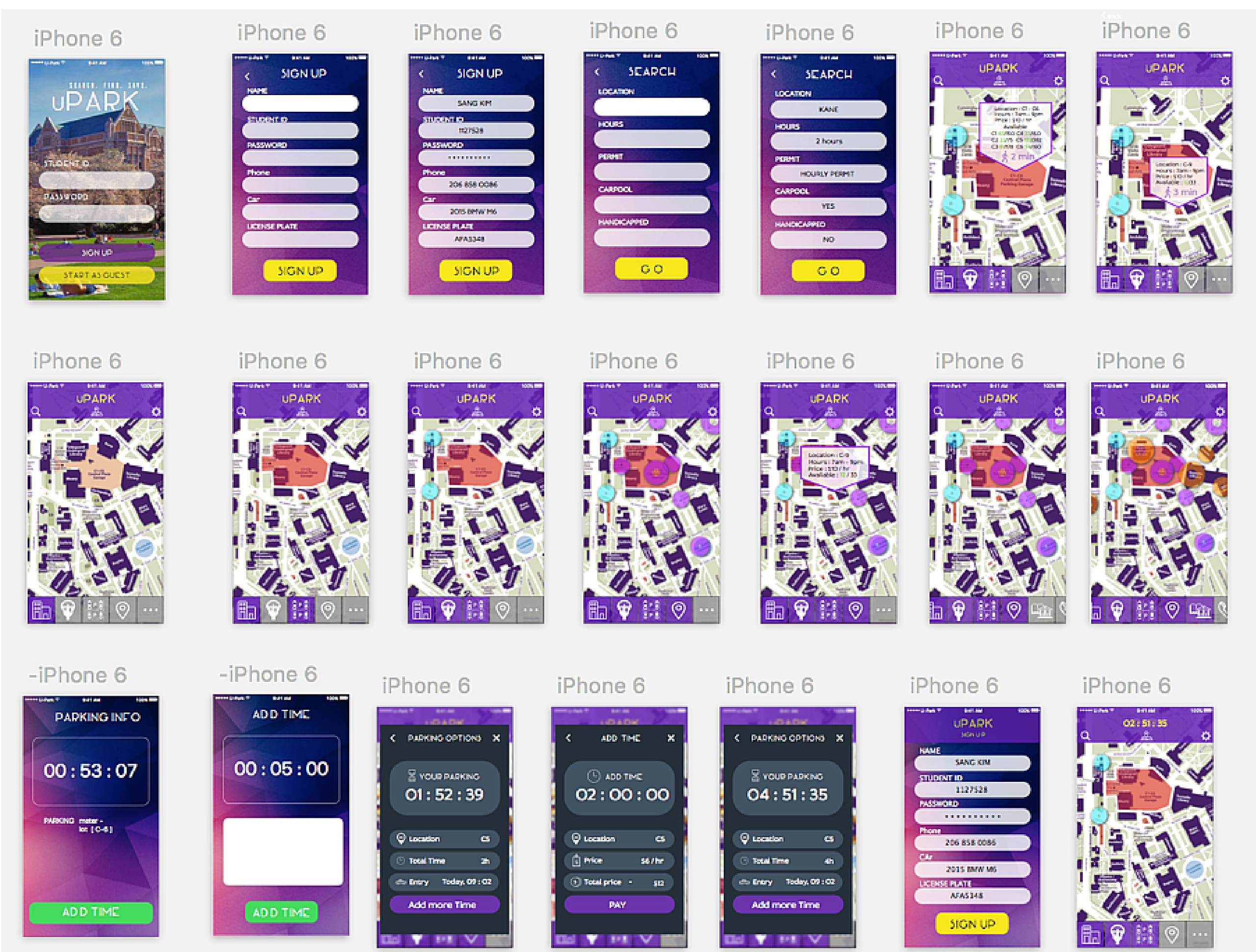
Homepage

Map with
Filter func.



My Parking Info &
Add more time

Graphic design and layout



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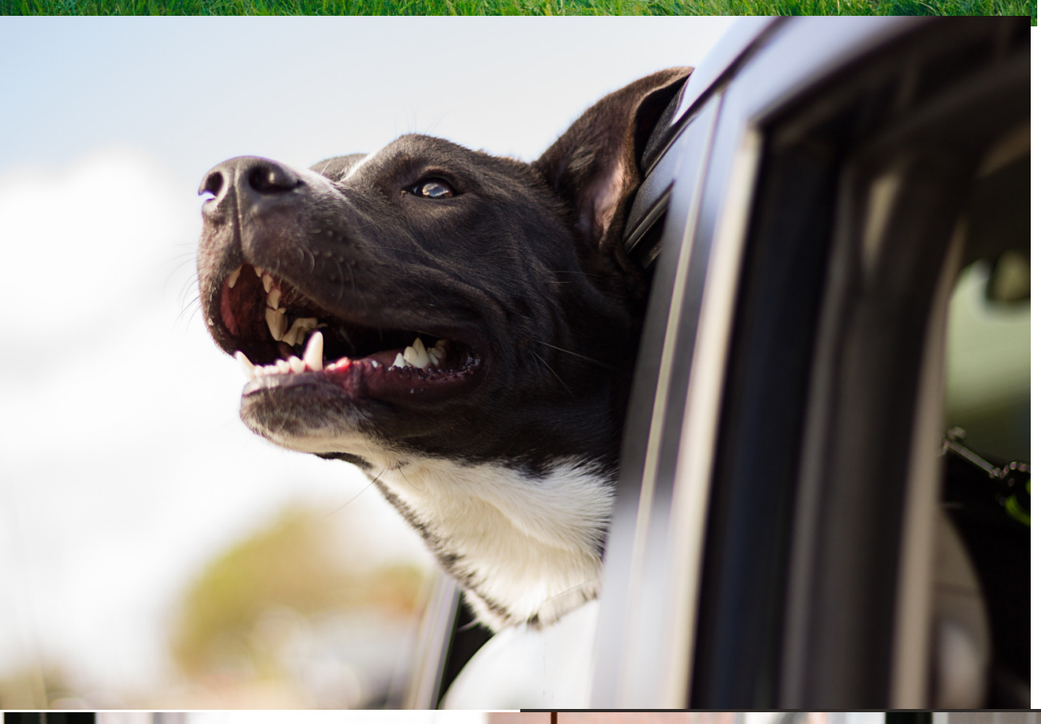
By providing real-time access to parking data, we hope to do our part in reducing vehicle emissions and increasing students' quality of life.