Husky Parking Pal

Crows GPS

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Abdullahi Diriye, and Adrienne Co

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Summary Table

Team Member	Role	Responsibilities	Deliverables
Tolaesh Mengeste	We worked together as a team. So, everyone contributed accordingly	Organization, Ideation and product direction	Personas, scenarios, Use Cases, functional and non-functional requirements, PACT Analysis, interview questions
Ashley Hay	Working collaboratively with team members	Ensure that assignment fulfills assignment rubric criteria	Interviews, questionnaire questions, context scenario, product requirements(ie functional and non-functional), usability testing(e.g. think out loud), design principles and guidelines, prototypes, product description
Lauren Bratt	No specific role set but worked collaboratively in the team	Reviewing assignments before submission	Persona, scenario, functional and non-functional requirements, storyboard, partial rough prototype, rough interview questions
Leul Hagos	No specific role; collaboratively worked together	Contributing to the completion of tasks	Interviews, questionnaire, persona, draft prototype, usability testing, functional and non-functional requirements
Abdullahi Diriye	No specific role; collaboratively worked together	Contributing to the completion of tasks	Interviews, questionnaire questions, functional and non-functional requirements, draft prototype, usability testing
Adrienne Co	No specific role; collaboratively worked together	Set up documents and the their list of what needed to get done	Interview questions, scenarios and requirements, questionnaire questions, initial prototype, elevator pitch, and usability testing approach

Husky Parking Pal Description

The Husky Parking Pal is a smartphone app aimed at UWB car commuters to make parking on campus less stressful. The app allows students to check current parking and traffic activity on campus and for an extra fee, reserve a parking space ahead of time to ensure a spot when they get to campus. Additionally, they can be navigated to open parking spots or their reserved parking spot via GPS navigation.

Summary Briefing

Competitor Analysis

Google Maps

Strengths:

- Finds parking lots
- Gives multiple routes to destination
- Gives traffic information
- Displays estimated time of arrival
- Marks closed and high-congested roads

Weaknesses/Flaws:

- Currently no way to book spots
- No pricing information for parking
- Traffic information not available to garage parking areas
- Possible to get bus or walking directions instead of driving

Best Parking App

Strengths:

- Gives pricing info for parking spots
- Can reserve spots
- Simple Interface

Weaknesses/Flaws:

- Limited garages with reservable spots
- Doesn't work for UW Bothell
- Possible to accidently select incorrect parking lot if using the map

Waze

Strengths:

- Alerts about of traffic, accidents ahead, police, hazards
- Will change route to save time

- Community based, real-time feedback
- Choice of variety of voices to guide you while you drive
- Carpool options

Weaknesses/Flaws:

- Cluttered display and layout
- Excessive use of battery
- Intrusive ads
- Missing road and junctions (not accurate enough)
- Large number of icons displayed that are vague and unexplained
    - Possible to misinterpret what a symbol means
- Most streets unmarked in app
- Many streets in desktop version are difficult to read
- Possible to select an icon instead of an alternate route

Parkmobile

Strengths:

- Over one million reservable parking spots
- Variety of notification options, such as ones for parking expirations
- Easy for businesses to integrate Parkmobile
- Can be used to pay for both street and lot parking
- Allows for time extensions

Weaknesses/Flaws:

- The fee for reservation is not fixed
- No customer assistance
- No option for a time extension
- It is sometimes not clear that parking spots can be reserved with Parkmobile
- Desktop version only shows reservable parking
- Not clear how long it takes for payment to process
- Possible to accidently not finish payment process

Key Opportunities

- Combine strengths of GPS navigation apps with parking apps
- Reserve a parking spot on campus from phone or computer
- Get traffic notifications
- Focus specifically UW Bothell
- Could expand into other UW campuses

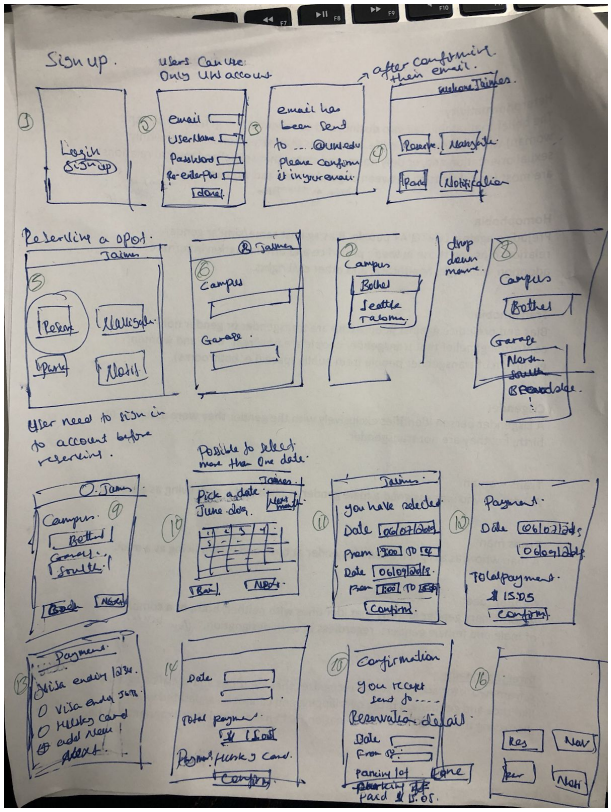
Requirements Specifications

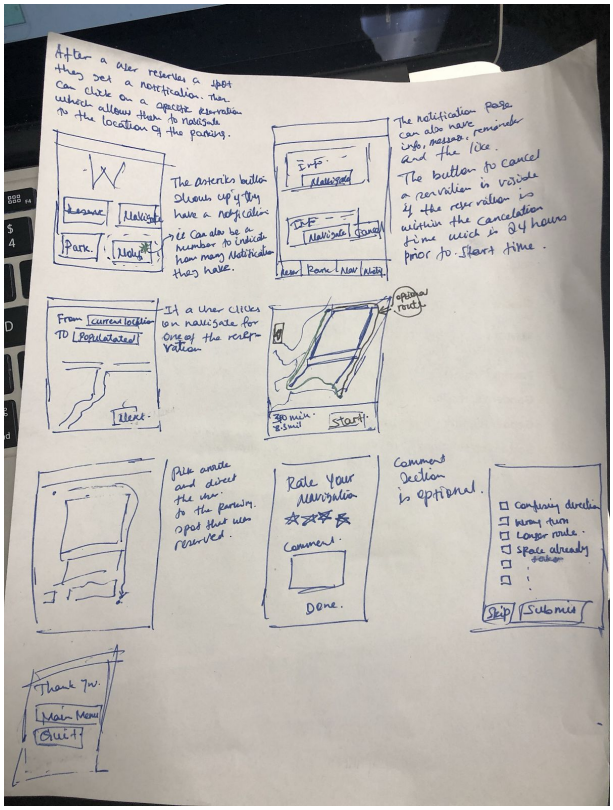
FR-ID	Functional Requirements
1.1	The system must have access to the user's current location, NetID, vehicle information.
1.2	The system must give live directions to any parking space chosen and/or confirmed by the user.
1.3	The system should show the nearest parking space available and must be able to give directions through both audio and text.
1.4	The system must send a confirmation and receipt of digitally paid hourly parking and reservation parking to the user's linked email.
1.5	The system must prevent users from reserving more than one space with overlapping times.
1.6	Users must be able to reserve a parking spot given the time, date, and preferred lot that the user wants to reserve for.
1.7	System must correctly update the "My Reserved Spots" page with the time, date, and preferred lot of the new reservation.
1.9	Users should be given the option to pay for hourly parking and paid reservation parking via the app.

NFR-ID	Non-Functional Requirements
1.1	The application should have a 98% online availability rate.
1.2	The app should refresh every 5 seconds when in use (system updates available spot numbers and freed.
1.3	The app should recognize audio input from at least five feet away from the source.
1.4	The app should not use more battery life than other GPS/navigation apps when running.
1.5	Sending confirmation of payment emails should not take more than a minute.

1.6	Navigation estimated time of arrival is updated in real time upon various criteria, such as traffic or weather.
1.7	The system should handle the user's information securely to protect their privacy
1.8	System software updates should not take more than 1 hour with no disruptions to user service.
1.9	The application should respond to user's requests in under 2 seconds.
1.10	Updates that require the system to be offline will occur at 12:01 am PST.
1.11	The application requires a user reserving a spot to register their vehicle information.

Design Sketches





Relation to the PACT Process

People

- Users using our application may be beginners, intermediate or experts, therefore its essential for the application to cater for all its users
    - The primary users are as follows: UW Students, faculty/staff, and campus visitors
- Users with a UW netID are prompted to link their Husky Parking Pal account to their netID for easier and securer access

Activites

- The user, who usually gets to campus just before their class starts sees the notification
- The user leave earlier than they usually do to ensure that they still get to class on time
- While on campus, the app directs the user away from highly congested parking lots and towards less congested areas to save time looking for parking

Context

The circumstances under which the app is used is as follows:

- When the user is parking on the UW Bothell campus
- User is under pressure of time to find an open parking spot
- The user is unfamiliar of the campus parking areas or looking to park in certain areas such as carpool, electric car parking, handicap, ect.
- The user is computing to campus during the busy peak hours

Technology

The application requires various technologies in order to interact fully:

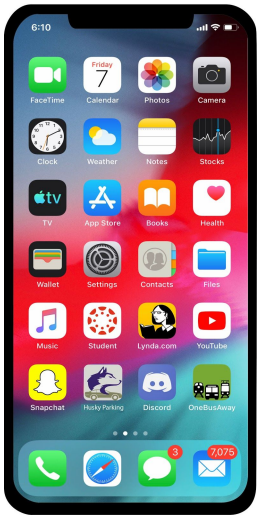
- Smartphone: The application runs on a smartphone and must be just as responsive as other GPS applications
- GPS: The device must access its current location to navigate

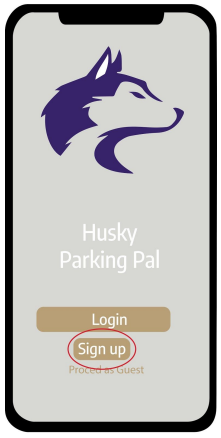
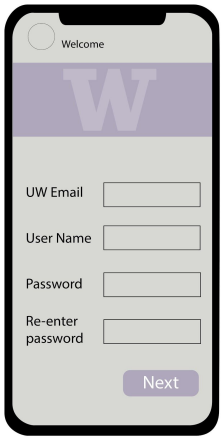
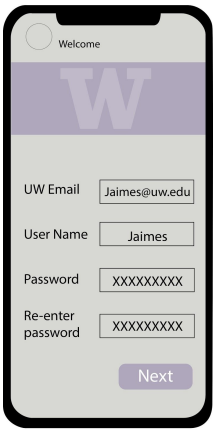
Input: Supports audio input during navigation and text input

Output: Visual and audio response and output. Graphical Interface showing real-time updates

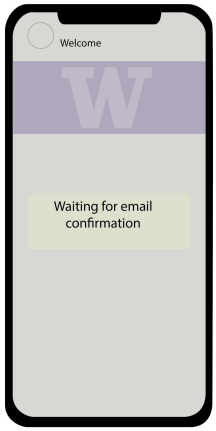
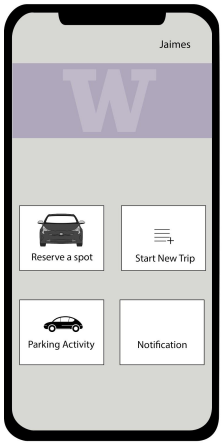
Final Interface Design

Creating an Account

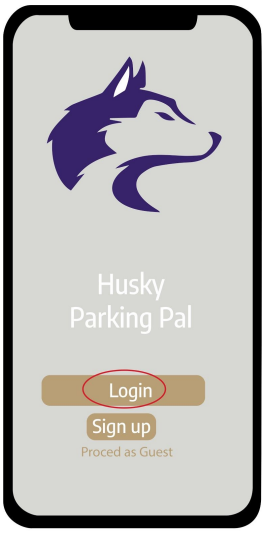


			
<u>Home Page</u> Prompts user to login or to create an account. <u>Actions</u> User can click the *Login* button to login or click the *Sign up* button to create a new	<u>Account Creation Page</u> Prompts user to enter information for the new account <u>Actions</u> Users can fill out the displayed input fields. Once they are done, users can click the	<u>Account Creation Page</u> Prompts user to enter information for the new account <u>Actions</u> Users can fill out the displayed input fields. Once they are done, users can click the	<u>Account Creation Page</u> Prompts user to enter information for the new account <u>Actions</u> Users can fill out the displayed input fields. Once they are done, users can click the

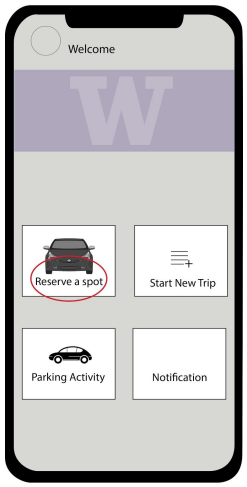
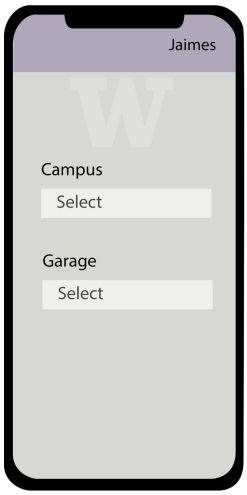
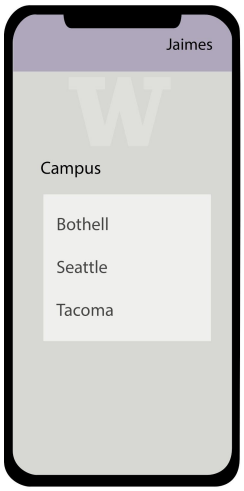
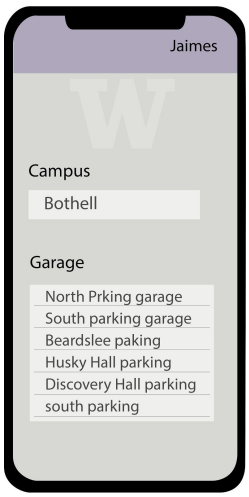
account. <u>Rationale</u> Users are asked to sign in since the main features of the system require an account.	*Next* button to continue.	*Next* button to continue.	*Next* button to continue.

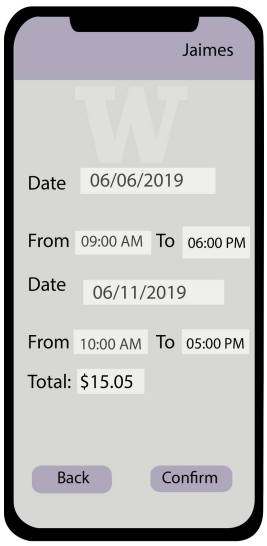
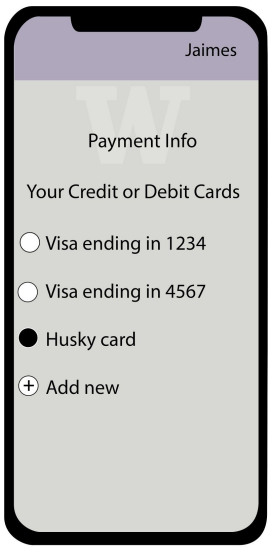
	
<u>New Account Confirmation Page</u> System sends a confirmation email to user and waits for them to confirm their account. <u>Actions</u> Users cannot do anything on this screen.	<u>Main Menu</u> Allows users to select the action they want to perform.

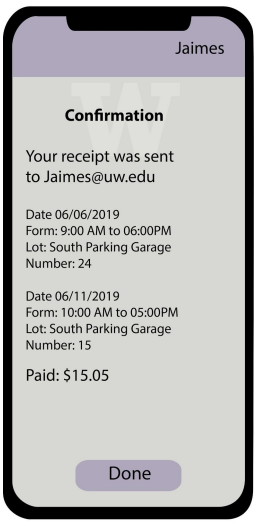
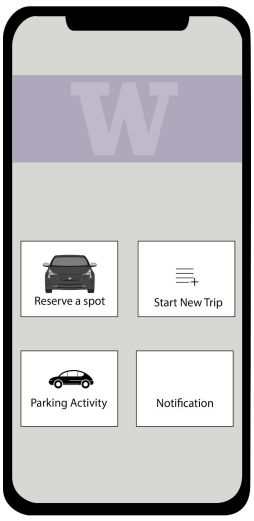
Sign in

		
<u>Home Page</u> Prompts user to login or to create an account. <u>Actions</u> User can click the *Login* button to login or click the *Sign up* button to create a new account. <u>Rationale</u> Users are asked to sign in since the main features of the system require an account.	<u>Login Page</u> Prompts user to sign in <u>Actions</u> Users can enter their username and password in the labeled input fields. Users can then click the *Sign in* button to login.	<u>Login Page</u> Prompts user to sign in <u>Actions</u> Users can enter their username and password in the labeled input fields. Users can then click the *Sign in* button to login.

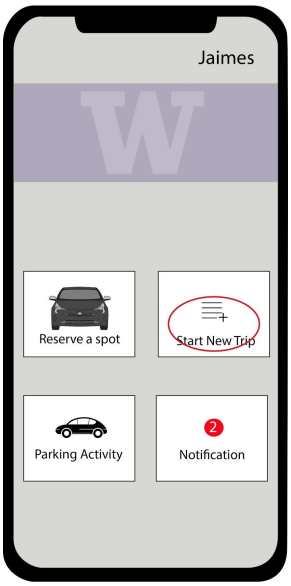
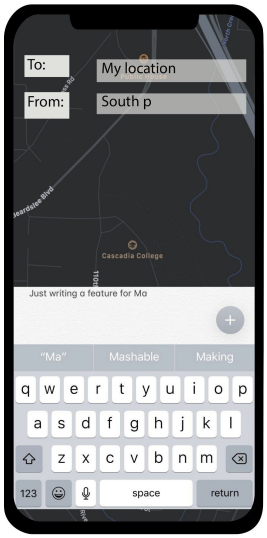
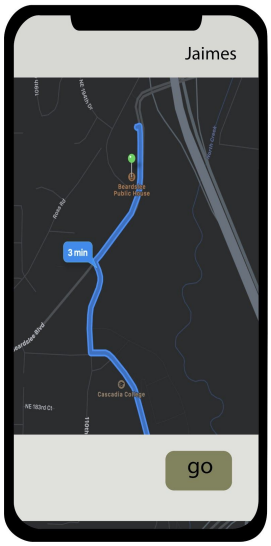
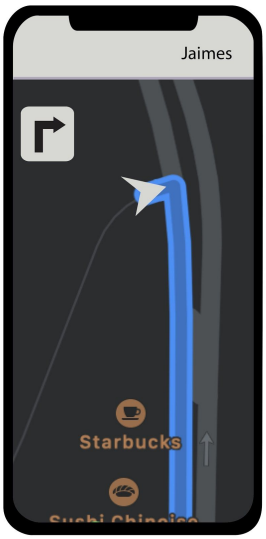
Reserving a Parking Spot on Campus

			
<u>Main Menu</u> Allows users to select the action they want to perform. <u>Actions</u> Users may click the *Reserve a spot* button, *Start a new trip* button, *Parking activity* button, and *Notification* button to reserve a spot, get directions, check parking activity, and check notifications respectively. <u>Rationale</u> These four actions are the main features of the app so we decided to put them all together on a menu page.	<u>Parking Location Selection Page</u> Allows users to select the location of their prefered parking spot. <u>Actions</u> Users can select the campus and garage of their preferred parking spot from the two labeled drop down menus.	<u>Parking Location Selection Page</u> Allows users to select the location of their prefered parking spot. <u>Actions</u> Users can select the campus and garage of their preferred parking spot from the two labeled drop down menus.	<u>Parking Location Selection Page</u> Allows users to select the location of their prefered parking spot. <u>Actions</u> Users can select the campus and garage of their preferred parking spot from the two labeled drop down menus.

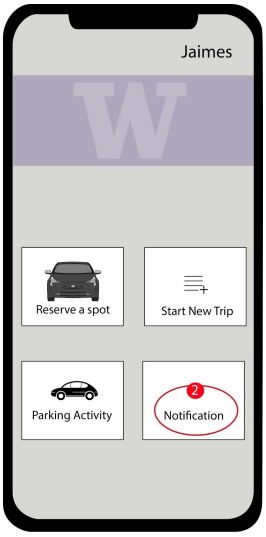
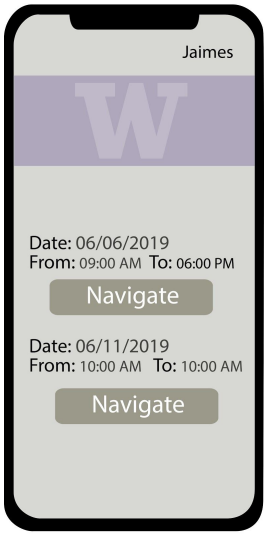
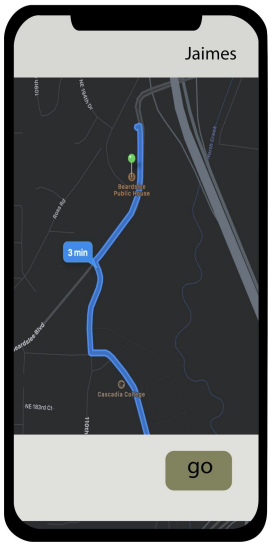
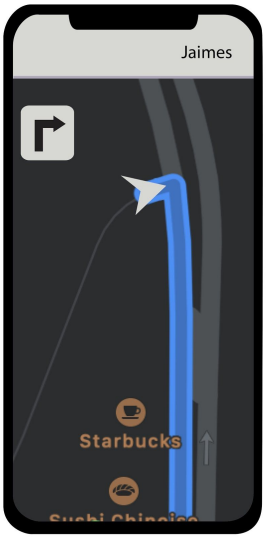
			
<u>Reservation Location Selection Page</u> Allows users to select the location of their prefered parking spot. <u>Actions</u> Users can select the campus and garage of their preferred parking spot from the two labeled drop down menus.	<u>Reservation Date Selection Page</u> Prompts users to select the date of their reservation <u>Actions</u> Users can select the date and time of their parking reservation	<u>Confirmation Page</u> Prompts users to review the time, date, and payment amount of their reservation <u>Actions</u> Users can click the *Confirm* button to confirm the displayed information or click the *Back* button to change a field.	<u>Payment Page</u> Prompts users to choose their payment information <u>Actions</u> Users can click the *Confirm* button to confirm the displayed information

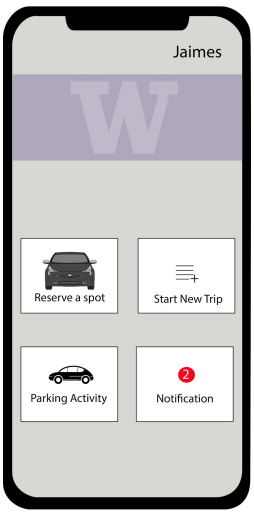
	
<u>Confirmation Page</u> Gives users a confirmation that their reservation has been completed <u>Actions</u> Users can click the *Done* button to return to the Main Menu	<u>Main Menu</u> Allows users to select the action they want to perform.

Navigating to Campus

			
<u>Main Menu</u> Allows users to select the action they want to perform. <u>Actions</u> Users may click the *Reserve a spot* button, *Start a new trip* button, *Parking activity* button, and *Notification* button to reserve a spot, get directions, check parking activity, and check notifications respectively.	<u>Campus Destination Page</u> Allows users to select the campus they would like directions to <u>Actions</u> Users may select the campus they would like directions to and their start location using the labeled input fields	<u>Navigation Instructions Page</u> Provides live navigation instructions to user	<u>Navigation Instructions Page</u> Provides live navigation instructions to user

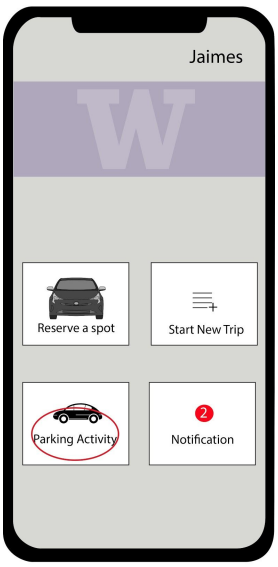
Navigating from notification

			
<u>Main Menu</u> Allows users to select the action they want to perform. <u>Actions</u> Users may click the *Reserve a spot* button, *Start a new trip* button, *Parking activity* button, and *Notification* button to reserve a spot, get directions, check parking activity, and check notifications respectively.	<u>Notifications Page</u> Shows a user a list of current reservations <u>Actions</u> Users can navigate to the location of a reservation by clicking the reservations' corresponding *Navigate* button	<u>Navigation Instructions Page</u> Provides live navigation instructions to user	<u>Navigation Instructions Page</u> Provides live navigation instructions to user



Main Menu
Allows users to select the action they want to perform.

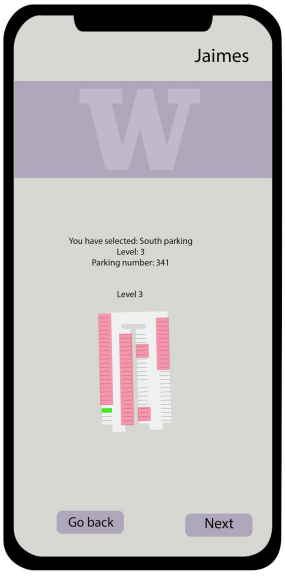
Navigation to a Spot on Campus



Main Menu
Allows users to select the action they want to perform.

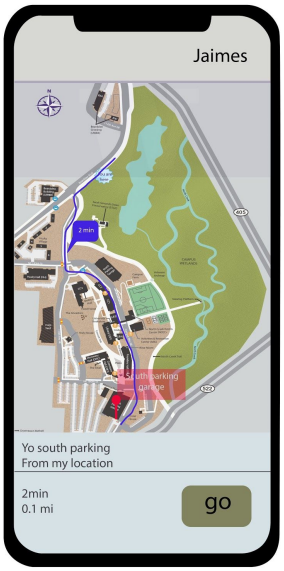
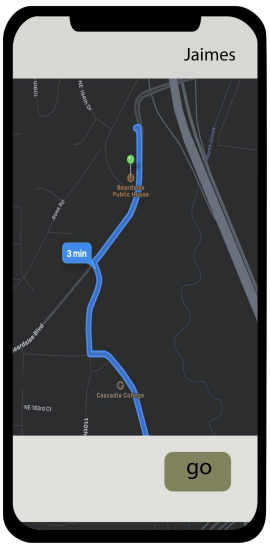
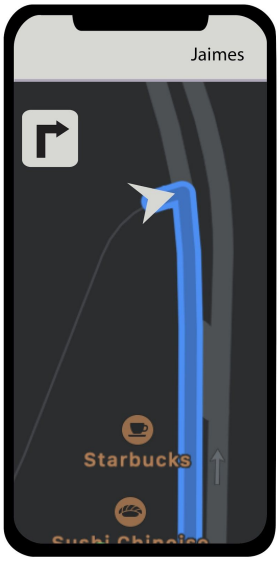
Destination Selection Page (Garage)
Allows users to select the garage they would like to

Destination Selection Page (Parking Space)
Allows users to select the parking space they would like to

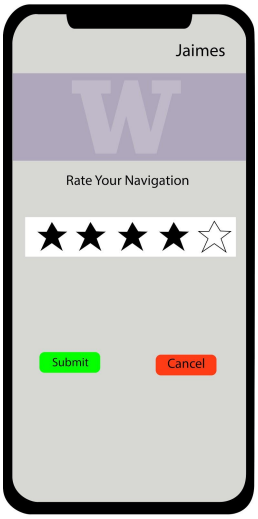
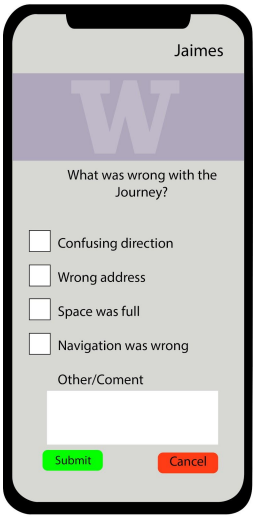


Destination Selection Page (Confirmation)
Allows users to confirm the parking destination they

<u>Actions</u> Users may click the *Reserve a spot* button, *Start a new trip* button, *Parking activity* button, and *Notification* button to reserve a spot, get directions, check parking activity, and check notifications respectively.	navigate to. <u>Actions</u> Users can select their prefered garage by tapping its location on the map	navigate to. <u>Actions</u> Users can select their prefered parking space by tapping its location on the map. Users can then click *Next* to continue or *Go Back* to change their prefered Garage.	would like to navigate to. <u>Actions</u> Users can click *Next* to continue or *Go Back* to change their prefered Garage.

		
<u>Navigation Start Page</u> Start Page for navigation instructions <u>Actions</u> Users can select the *Go* button to start navigation instructions	<u>Navigation Instructions Page</u> Provides live navigation instructions to user	<u>Navigation Instructions Page</u> Provides live navigation instructions to user

Leaving a Review

		
<u>Navigation Rating Page</u> Allows users to rate their navigation experience <u>Actions</u> Users can select the amount of stars they would rate their navigation experience. Users can then click the *Submit* button to confirm their rating or press *Cancel* to return to the Main Menu. <u>Rationale</u> We decided to use the five star rating system since it is simple and easy for a user to use while still providing the system with useful information.	<u>User Dissatisfied Page</u> Allows users to explain why their experience was negative. <u>Actions</u> Users can select the listed reasons for dissatisfaction or they can input their own custom reason in the provided text box. Users can then click the *Submit* button to confirm their reasoning or *Cancel* to return to the Main Menu. <u>Rationale</u> We added this page so that users can share ways to improve our system.	<u>Rating Confirmation Page</u> Tells users their ratings has been submitted successfully. <u>Actions</u> Users can select the *Done* button to return to the Main Menu.

Usability Evaluation Criteria and Metrics

Metrics are measured per task performed during the testing of our Husky Parking Pal paper prototype as depicted in the final interface design. Measures gathered based on these metrics will be compared to other testers to tweak our final interface design. Each test will be recorded

to post-analyze precise performance metrics such as task completion rate, time-based efficiency, and errors per task.

Usability Metric	Operational Definition	Testing Method
Task Completion Rate	Percentage of users who were able to complete the described task without getting stuck/asking questions about what to do next	Keep track of the users who complete the task successfully on their own for the first time out of the total number of testers.
Time-Based Efficiency	Time it takes to successfully complete a task the first time will be compared to the time it takes to complete that same task again	Compare how long it takes for the user to successfully complete a task (from initiating the task by clicking the appropriate button to getting back to the home page) the first time to the time it takes to complete the same task a second time
Errors per Task	Number of errors occurred while completing a task (i.e. misclicks, missed steps, and mistakes)	Count the number of times the user notably makes an error throughout each task
Task and Overall Satisfaction	Quantitative number or qualitative response given by the user regarding how satisfied they were with each task and the overall experience	Upon initial completion of each task, the user will verbally answer a few questions regarding how much they enjoyed and how satisfied they were with the process and overall experience
Task and Overall Frustration	Quantitative number or qualitative response given by the user regarding the difficulties and frustrations with each task and the overall experience	Upon initial completion of each task, the user will verbally answer a few questions regarding how difficult they thought the task was to complete and any frustrations. They will be asked about the difficulty and frustrations of the overall experience at the end of the test as well