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## Abstract

The UCLA campus is large and has a hilly terrain which presents several accessibility challenges that can pose significant barriers to students, staff, and visitors, especially those with mobility impairments. New students, in particular, often find themselves disoriented, trying to figure out the quickest way to get from one class to another. For students with disabilities, this challenge is intensified. Ramps, elevators, accessible restrooms, and barrier-free pathways must be identified and utilized, which can be difficult. Unfortunately, the existing UCLA campus map for accessible routes is not interactive and difficult to read. It currently suffers from a cluttered design, which makes it difficult for users to identify which wheelchair-accessible pathways and entrances they should take to reach their destinations more efficiently. There is an urgent need for a comprehensive digital transformation.

To address these concerns we propose the development of BruinRoute, a student-created app for UCLA, that offers an easier way for students with disabilities to navigate campus. The application seeks to address the daily challenges faced by students with disabilities through the use of a user-friendly interface that helps them find accessible routes to and from their classes while also allowing them to report any inaccessible routes they come across. It integrates with the user's class schedule and maps out the quickest route, while keeping in mind the accessible entryways, ramps, and elevators. The design of the app allows students to have a clearer viewing experience, where students can click on buildings or destinations of interest and then see relevant information. By adopting a minimalist design approach, the clutter on the existing map will be significantly reduced, allowing for improved visibility of the wheelchair pathways and accessible facilities. Our expected outcomes are a more positive, accessible, and personalized user experience.

## Project Schedule:

### **Week 4**: Research

Assignment 4: Understanding the Problem Space for your Main Project (due 10/29)

We will conduct field observations on the UCLA campus, paying attention to navigation challenges and accessibility features. We will also begin stakeholder interviews to gather insights and experiences from students with disabilities and campus offices such as the Equity, Diversity, and Inclusion center, specifically the ADA 504 Compliance office. Techniques include an ethnographic approach for fieldwork and direct observations, literature review, and structured interviews.

Responsibilities:

*Group*: Creating an interview list (identify stakeholders and their roles) and questions. Collaborate on putting together resources for literature review.

*Individual*: Make observations about the campus, especially the accessibility routes, take photos, and write an ethnographic report. Conduct stakeholder interviews.

Deliverables:

Project report, slide deck presentation

### **Week 5**: Prototype

Assignment 5: Design Prototyping (due November 5)

We will use the design recommendations we obtain from Assignment 4 to conduct a design sprint to solidify our design concepts and create a prototype.

Key methods: user personas, objectives and journey; information architecture; low-fi and wireframe sketches; interactive hi-fi sketches, or functional front-end web based implementation, A/B test with more than one prototype?

* Document the process

Responsibilities:

*Group:* decide how we want to integrate recommendations from Assignment 4 into our design, decide how to split user personas, objectives, and journey as well as information architecture, reconvene to create low-fi and wireframe sketches, generate interactive hi-fi sketches

*Individual:* each member completes either the user personas, objectives, journey, or information architecture

Deliverables:

Updated project report, updated slide deck

### **Week 6**: Revisions & Feedback

**Assignment 6: User feedback & design revisions, Due Nov 12**

We will develop a script and recruit 5-10 users to conduct user testing of our design, preferably in person. We will then make changes to our design based on user feedback

Responsibilities:

*Group/Individual*: Team will meet and discuss methods of recruiting users and create a script for user testing. Teams of 2 will conduct user testing (subject to change based on availability and testing location). Collectively report findings of user testing and discuss changes. Individuals will make changes assigned.

Deliverables:

Slide deck presentation, Project Report

### **Week 7:** Personal Reflections

*Individual:* Complete assignment 7, a personal reflection 700-1000 words.

### **Week 8**: Final Presentation Draft

**Assignment 8: Final Draft of Final Presentation (due 11/26)**

Responsibilities:

*Group/Individual*: Collectively edit the slide deck to choose the relevant slides that best capture the idea of BruinRoute, our design process, user personas, etc. Meet to practice presenting to ensure the full presentation is under 10 minutes.

Deliverables:

Slide deck presentation, short summary

### **Week 9**: Final Presentation

**Assignment 9: Final Presentation (due 12/3)**

Responsibilities:

*Group*: Record the presentation and make sure it is 10 minutes or shorter. Collaborate on the readme to describe all the contents.

*Individual:* Help put all documents, pictures, presentations, etc. in a github repository.

Deliverables:

Final presentation slide deck, video recording of presentation (Upload to Youtube and submit the link), Final project report, Presentation materials, Github repository with all files and directories clearly labeled, read me file that introduces the project and outlines the contents of the repository

## **Research Techniques:**

Field Observations/Ethnographic Reporting: In Week 4, we will conduct ethnographic fieldwork and direct observations on the UCLA campus, focusing on navigation challenges and accessibility features. This hands-on approach allowed for a deeper understanding of the campus environment and the challenges faced by students with disabilities.

Literature Review: In week 4, we will also complete a literature review to gain insights into existing accessibility issues on college campuses, providing a foundational understanding of the domain space and related challenges.

Structured Interviews: During the same week, we will conduct structured interviews with stakeholders, including students with disabilities and campus offices such as the Equity, Diversity, and Inclusion center, specifically the ADA 504 Compliance office. These interviews provided firsthand experiences and insights into the accessibility challenges faced by different stakeholders.

User Personas: As part of Assignment 5 in Week 5, we will develop user personas based on the data obtained during the research phase. User personas help in creating a user-centric design and understanding the diverse needs and objectives of the app's potential users.

User Journey Maps: We will also use user journey maps to visualize the steps and interactions users would have with the BruinRoute app. This mapping will help in designing the app with the user experience in mind.

Information Architecture: We will define the app's structure (sitemap) to ensure that the app's content and navigation is organized for optimal user accessibility and experience.

Low-Fi Wireframe Sketches: Low-fidelity sketches and wireframes will be created to outline the app's layout and functionalities. These sketches provided a visual representation of the initial design concepts.

Interactive Hi-Fi Sketches: High-fidelity, interactive sketches will be used to refine the visual and experiential aspects of the app's design, allowing for a more comprehensive representation of the prototype.

Usability Testing: In Week 6, we will conduct usability testing by recruiting users to test the design. This involves preparing user testing scenarios, recruiting test participants, conducting testing sessions, and analyzing the data to make design adjustments based on user feedback.

A/B Testing: We will also consider A/B testing with more than one prototype in the design phase, which involves creating and testing multiple prototypes to compare and refine design choices.

## **Design goals:**

* Digitize UCLA Campus Accessibility Map
  + Make accessible routes easy to locate on the digital map
  + Reduce clutter in the app’s interface by allowing users to filter by specific accessible areas
  + Allow users to select their destination and customize their route to fit their needs
* Features
  + Users can click on specific buildings or destinations to view suggested paths
  + Users can use a filter to select whether they want to view accessible entryways, ramps, and elevators
  + Integrates class schedules so users can find the fastest routes to their classes
  + Allows users to report inaccessible routes or any obstacles that block pathways, such as construction or broken elevators
* Inclusivity:
  + Inclusive design that caters to users with diverse needs, adheres to WCAG guidelines
* Feedback Mechanism: The app should incorporate a mechanism for users to report any inaccessible routes or facilities they encounter, allowing for continuous improvements and updates.
* Usability: Usability is a key design goal, and the app should be tested to ensure that it is easy to navigate, with clear instructions and understandable features.
* Clarity and Visibility: The app's design should be clutter-free and visually clear, with a minimalist approach that enhances the visibility of wheelchair-accessible pathways and facilities. Users should be able to easily identify the routes they need to take.
* Personalization: The design should allow for a personalized user experience by integrating each user's class schedule. It should consider individual preferences and constraints, such as preferred walking speed and potential scheduling conflicts.
* Coherent Design: The app should be responsive, adapting to different devices and screen sizes, ensuring that users can access it on smartphones, tablets, and computers.

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## **Outcomes:**

Expected outcomes include:

Improved Accessibility: The project aims to significantly enhance accessibility on the UCLA campus. The expected outcome is a campus where students, staff, and visitors with mobility impairments can navigate efficiently and independently, utilizing accessible routes and facilities. The development of the BruinRoute app is anticipated to lead to a more positive and user-friendly experience for all users. Students, in particular, should find it easier to move between classes, reducing stress and saving time.

Positive Impact on the UCLA Community: The expected outcome of the project is a more inclusive and supportive community at UCLA, where students, staff, and visitors all benefit from improved campus accessibility. It promotes equity and diversity by catering to the specific needs of students with disabilities.

Reduction in ADA Non-Compliant reports: Identification and reporting of ADA non-compliant areas or features on campus. A process for addressing reported issues and improving accessibility.

User engagement: Active user engagement with the reporting feature, resulting in a community effort to enhance accessibility. Clear communication between users and the university administration about accessibility concerns. Timely updates and responses to user-generated reports.