1. Introduction

This study investigates how users understand and navigate the "My Altitude" app on iOS. It is a free application that utilizes GPS signals to determine the user's current location, providing details such as latitude, longitude, and altitude (height above sea level). The app also offers barometric pressure readings and calculates the water boiling point at the user's location. It operates without an internet connection, making it ideal for outdoor activities. Additional features include capturing photos watermarked with the user's coordinates and altitude, and accessing current weather information. In-app purchases are available to remove advertisements.

2. Research Questions

1. How do users understand and operate the core features of "My Altitude"?
2. Which interface elements or interaction designs might cause confusion or user errors?
3. How satisfied are users with the app overall, and what suggestions do they have for improvement?

3. Method

3.1 Design

Tasks are designed to elicit cognitive activity across several core features of the app. The study uses a funnel structure, beginning with general prompts and proceeding toward more specific probes. All sessions will be audio and screen recorded.

3.2 Personas

- Outdoor Enthusiast: Frequently engages in hiking or climbing and relies on altitude and pressure data for trip planning.
- Travel Blogger: Passionate about documenting travel experiences and uses geotagged photos for social media sharing.

3.3 Participants

- Total: 6–8 participants
- 3–4 participants per persona group
- Recruited from hiking communities and travel communities

3.4 Instruments & Measures

- Discussion Guide with:
  - Warm-up probes
  - Usability Set-up probes
  - Tasks
  - General probes
  - Task-specific probes
- iPhone screen recording

3.5 Procedure

3.5.1 Warm-up Probes

- What do you do? Who lives in your household?
- What's your role when using location-based tools? Do you collaborate with others?
- What kind of questions do you usually have about this kind of app? Where do you turn for answers?
- What role does the internet connection play in your use of tools like this?
- What's the hardest part about using apps like this? What would make it easier?

- What would an ideal experience look like for you?

3.5.2 Usability Set-up Prompts

- Please verbalize your thoughts as you work through the app.
- I didn't design the app—so feel free to be completely honest.
- Use your finger or mouse to point to anything you're describing.
- This is not a test of your ability—we're testing the app.
- There are no right or wrong answers.

3.5.3 Tasks

1. Open the app and check your current altitude.
2. Retrieve the barometric pressure and boiling point.
3. Take a photo with the geographic watermark.
4. Repeat Tasks 1–3 using the Data Files feature.

3.5.4 General Probes

- What are you thinking right now?
- What are you paying most attention to and why?
- Who do you think this feature is for?
- Is anything confusing or unexpected?
- How easy is it to figure out what to do next?
- How do you feel about the flow of information?

3.5.5 Task-Specific Probes

Task 1: Check Altitude

- How do you know where to find the altitude reading?
- Does the interface clearly show what you're looking for?

Task 2: Retrieve Pressure & Boiling Point

- How do you know where to find the pressure and boiling point reading?
- Does the interface clearly show what you're looking for?

Task 3: Take Geotagged Photo

- How do you take a photo with a geotag watermark?
- Is the photo preview and output what you expected?

Task 4: Use Data Files

- How do you access and use data files to complete previous tasks?
- Does the app explain the difference between data files and device sensor?
- Do you think data files are helpful? Why or why not?

4. Data Analysis Plan

- Transcribe recordings for verbal data analysis
- Use Rubrics to determine intrinsic load and extraneous load
- Identify recurring themes, usability breakdowns, and cognitive strain
- Summarize findings into actionable design recommendations