

# Comprehensive Usability Testing and UX/UI Evaluation of Ni Hao Pengyou: Advancing the Traveler's Experience Through an Innovative Application

Advised by: Dr. Heather Guarnera

Nini Curcione

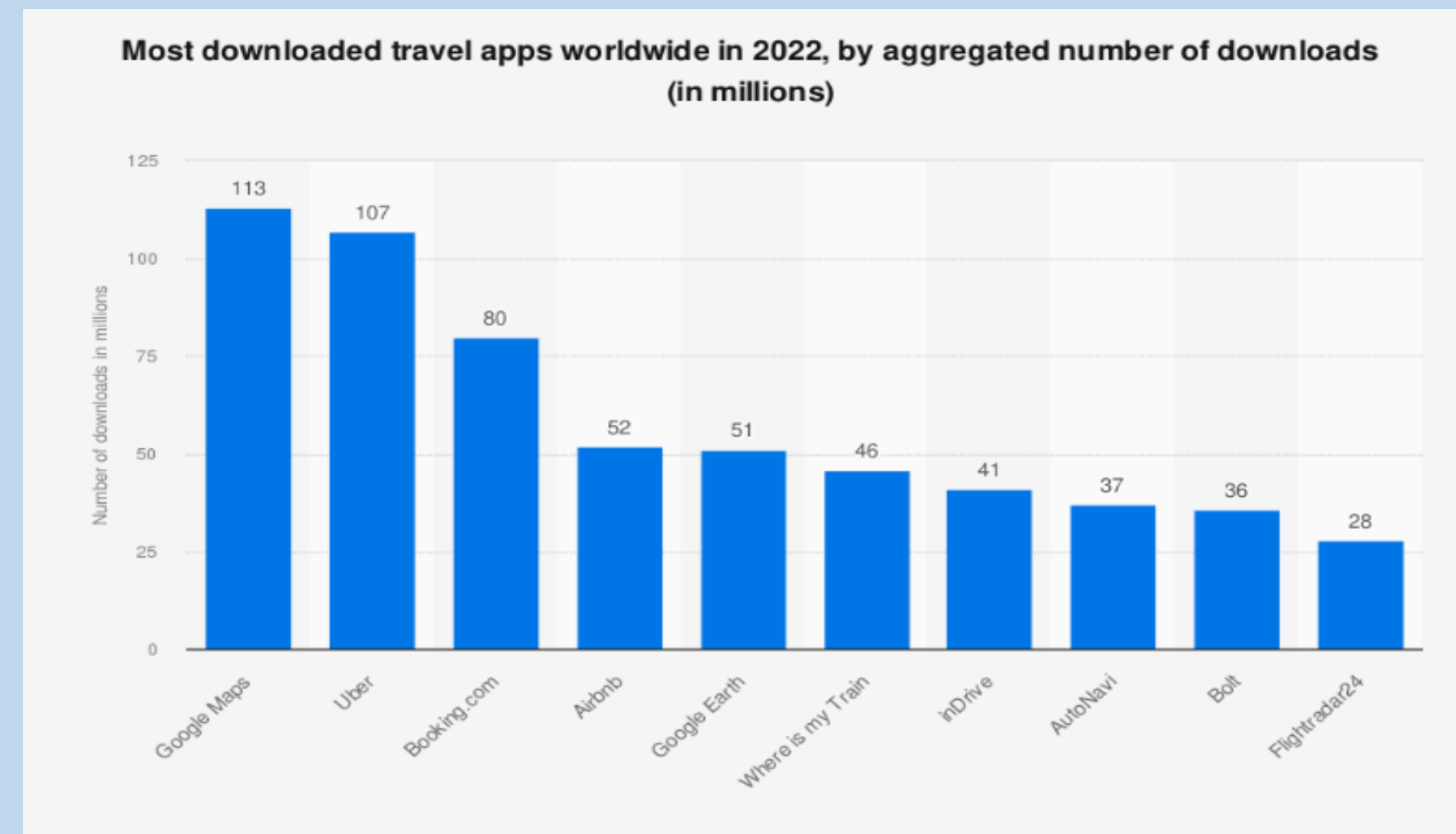
Department of Mathematical & Computational Sciences

## Introduction

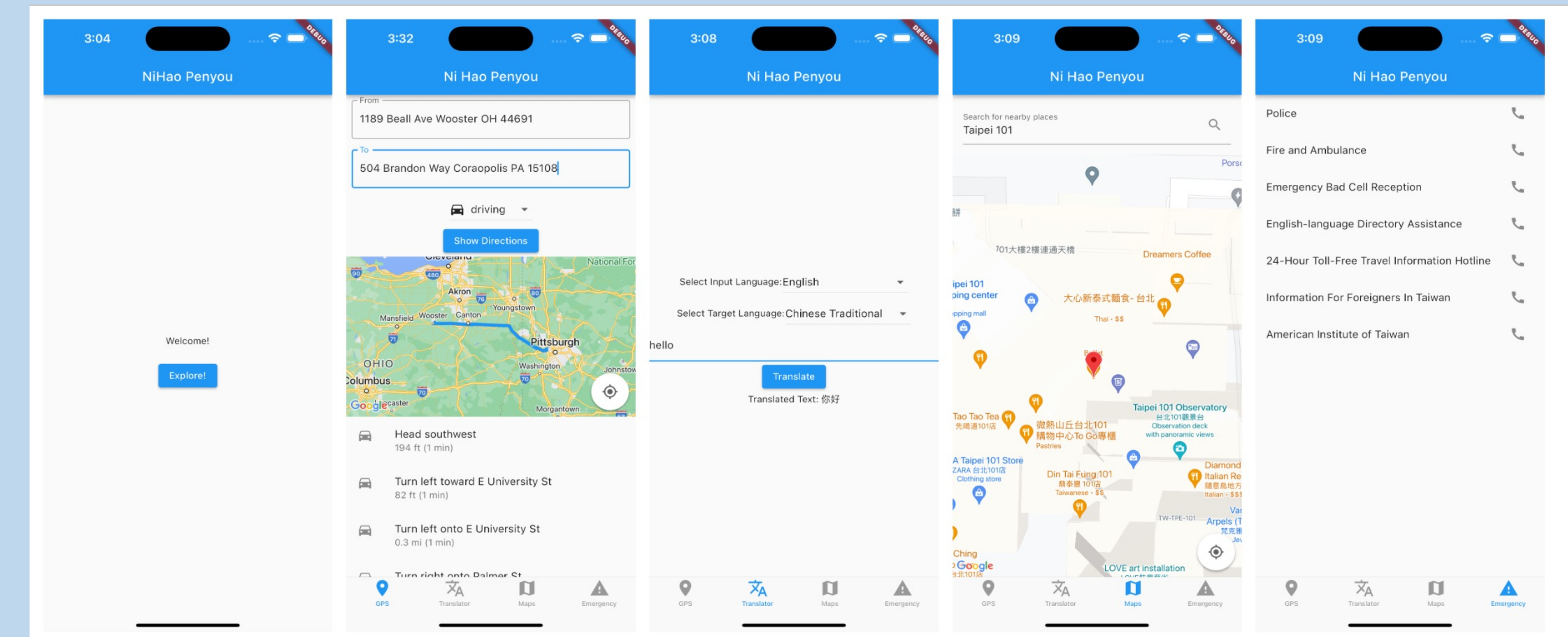
Drawing from my internship experiences in Taipei and the challenges of adapting to local public transportation as a Taiwanese-American, I was motivated to create an application designed for foreign travelers navigating Taiwan's transit systems. This app centralizes crucial information in English, such as translations, interactive maps, and emergency contacts, to facilitate a smoother travel experience. It's developed using the Flutter framework for cross-platform compatibility, and features key functionalities like GPS for public transportation, a dynamic translator, an interactive map, and direct links to emergency services. This project also delves into Human-Computer Interaction (HCI), focusing on User Experience (UX) and User Interface (UI) design principles, and employs usability testing to refine and ensure the app's effectiveness and user-friendliness for travelers in Taiwan.

## Case Study

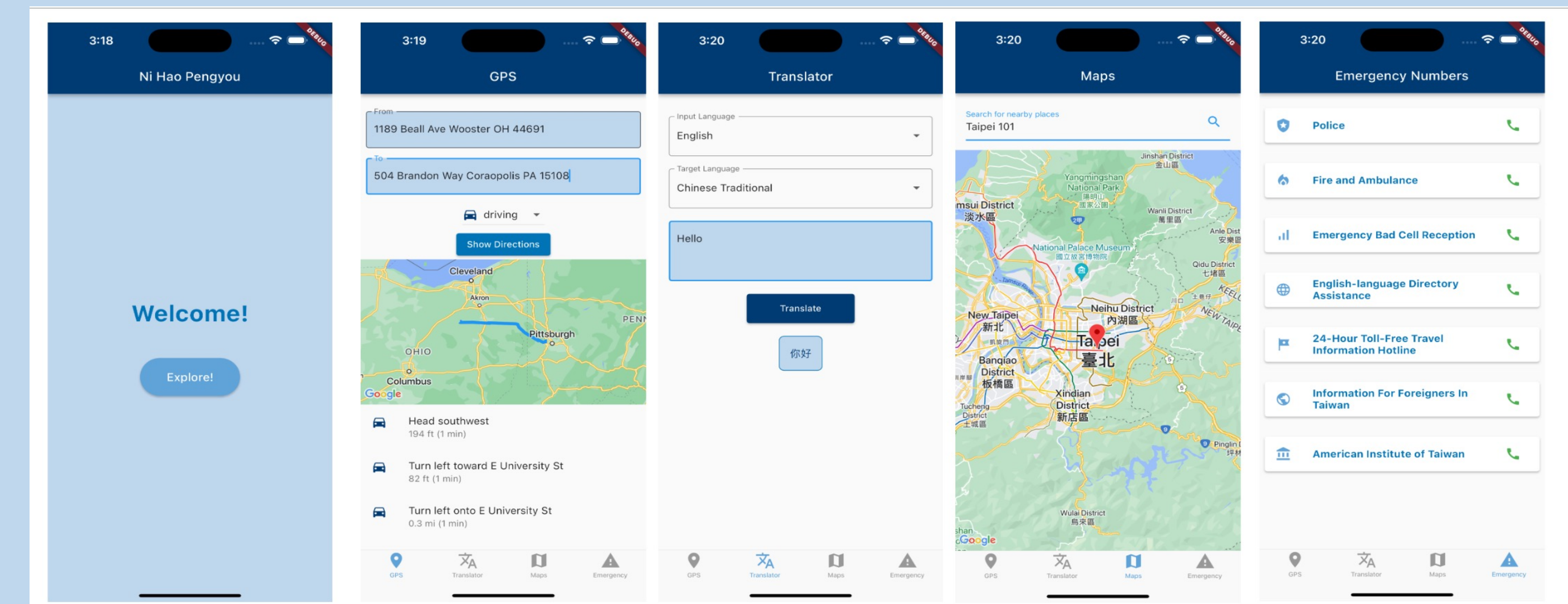
- Case Study of most downloaded travel applications including Google Maps, Uber, and Booking.com.
- Key UX/UI design principles across these apps include intuitive navigation and interface, real-time information provision, personalization, seamless integration of services, and accessibility and inclusivity.



## Prototype 1

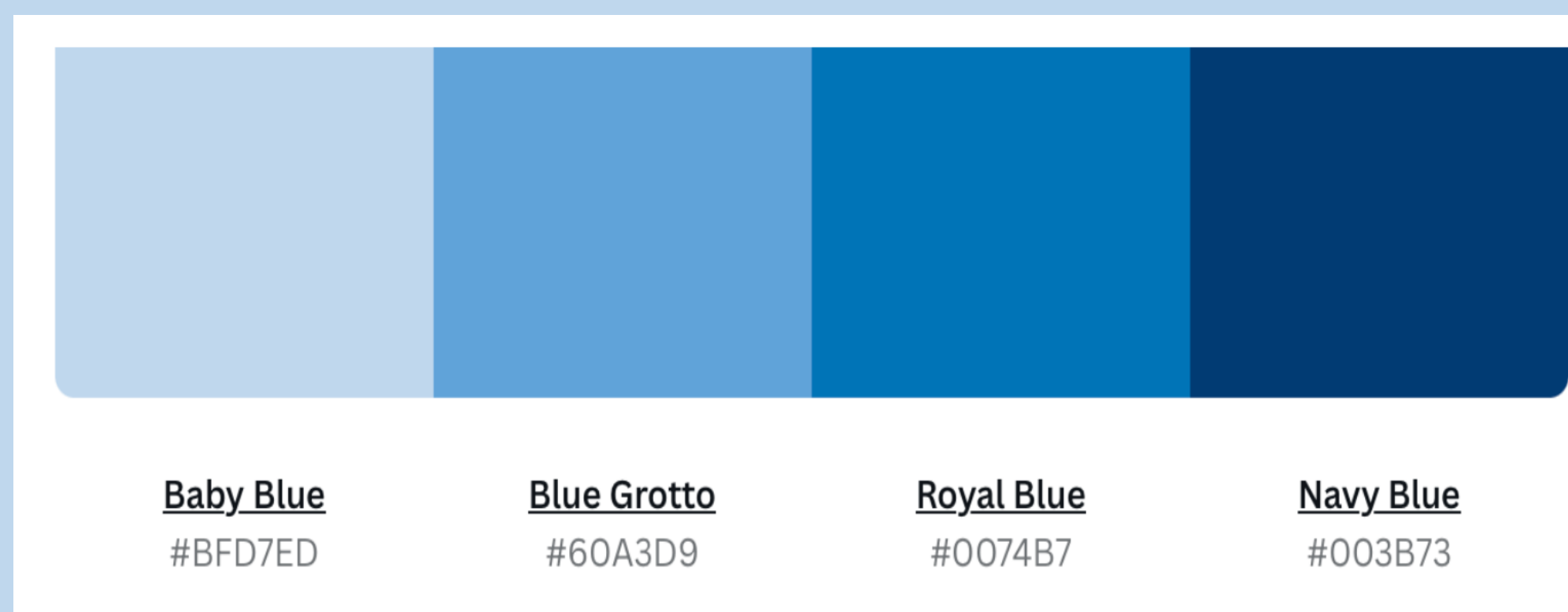


## Prototype 2



## UX and UI Design

- User Experience (UX) Design:** Focus on improving user interaction through research, design, and testing. Components such as user research, interaction design (IxD), information architecture (IA), and visual design is central to crafting products that are not only functional but also resonate with users on an enjoyable level.
- User Interface (UI) Design:** Concentrates on the interface's visual and interactive elements to increase satisfaction. Essential elements in UI design include layout, typography, color scheme, navigation, and interactive elements, each serving a distinct purpose in facilitating user interaction with digital products and services.
- Color theory in UX guides the strategic use of colors to enhance interface appeal and user interaction. Blue is likely to instill feelings of trust and calm, encouraging user comfort in sharing personal information, which could lead to overconfidence in security.
- The collaboration between UX and UI is crucial for developing successful and user-friendly products. Together, they ensure that a product is not only functional but also visually appealing and cohesive.



## Usability Testing

- 14 participants were asked to use each prototype to perform a series of tasks. To gauge their usage frequency and task ease, participants were asked to rate each app using a 4-point Likert scale ranging from very difficult '0' to very easy '4'.
- I then used quantitative and qualitative methods to evaluate two prototype applications.
- Results showed both prototypes had strengths, but Prototype 2 was favored for its user-friendliness, intuitive user experience, and design appeal
- Specific challenges in tasks like rating "Taipei 101" and navigating City Hall Square Car Park highlighted areas for future enhancement. Feedback also suggested improvements in navigation, translation features, and user interface, especially for Prototype 2.
- The study underscored the crucial role of user feedback in the iterative design process, aiming to make the prototypes more user-centric.

Comparison	Mean	Variance
Which prototype of the app did you find more user-friendly?	1.86	0.12
Which prototype of the app did you prefer based on the search functionality?	1.86	0.12
Which prototype of the app had a more appealing design?	1.93	0.07
Which prototype of the app would you prefer to use in the future?	1.93	0.07

	Mean		Variance	
	Prototype 1	Prototype 2	Prototype 1	Prototype 2
Overall				
How easy was it to understand the features and functions?	3.36	3.43	0.37	0.39
Rate how efficient the application was in terms of delays and number of steps to complete a task.	3.21	3.5	0.45	0.39
How often did you encounter errors or issues?	3.36	3.93	0.52	0.92
How would you rate the visual design of the app?	2.64	3.36	1.37	0.8

Tasks For Maps Feature	Mean		Variance	
	Prototype 1	Prototype 2	Prototype 1	Prototype 2
"Taipei 101" is a popular tourist destination. Find it on a map	3.43	3.36	0.39	0.52
Determine the rating of "Taipei 101"	2.64	3.00	1.23	1.86
Determine whether City Hall Square Car Park is north, south, or west of Taipei 101	1.57	2.79	1.09	1.17

Tasks For GPS Feature	Mean		Variance	
	Prototype 1	Prototype 2	Prototype 1	Prototype 2
Get driving directions to the following address: 5000 Forbes Ave Pittsburgh PA 15213 to 1189 Beall Ave Wooster OH 44691	3.36	3.71	0.52	0.49
Get walking directions to the following address: 5000 Forbes Ave Pittsburgh PA 15213 to 1189 Beall Ave Wooster OH 44691	3.71	3.86	0.35	0.27

Tasks For Translator Feature	Mean		Variance	
	Prototype 1	Prototype 2	Prototype 1	Prototype 2
Translate the following text to Chinese Traditional: "Hello"	3.71	3.64	1.06	1.09
Translate the following text to Spanish: "Hello"	3.71	3.79	0.63	0.6

Tasks For Emergency Feature	Mean		Variance	
	Prototype 1	Prototype 2	Prototype 1	Prototype 2
Navigate to the page which displays emergency numbers	4.00	4.00	0.00	0.00

## Project Implementation

- Developed with Flutter, VSCode, and performed iOS testing with Xcode
- Integrates Google Cloud APIs for translation, geocoding, directions, maps on iOS, and places.