University Walking Tour

Github

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Introduction

This system design documentation is made for University Walking Tour application in COMP 195. The goal of University Walking Tour to be is making tourist or newly arrival students could travel in University of the Pacific with guidance.

The purpose of this system design document is to provide and track the necessary information on the system architecture to be developed. Its intended audience is the project manager, developers, and the instructor.

System Architecture

- Software Modules

  Overall, there will be 3 modules to this android application. The 1st module will implement the file-reading module. The main purpose of this module is to read saved buildings from a csv file and allowing the program to use them. Once we have the building list, we can use Google Map API. The 2nd module will implement the tour module. Here, the user will choose a interested building type, then start a tour by following the generated shortest tour route. This module will not only include the selected buildings but also the data on specific buildings and the brief history behind them. The 3rd module will be directing mode, which is from point A to point B.

- Hardware Components

  The main hardware component will be the user's phone. No other hardware equipment is required.

- The User Interface

  Refer to the user interface design section below.

- Interfaces to external systems

  Android API and Google Map API will be used in the programming of this android application.

Hardware, software and system Requirements

Hardware requirements:

This program is designed to be running on a smart phone with Android OS or in an Android OS simulation environment on a laptop or desktop computer with Wi-Fi and GPS access.

Software requirements:

There are no software requirements.

System requirements:

Android OS version is or higher than Android 12.0(S).

External Interfaces

We will be using Google Map API and Android API for this program, please refer to the documentation link under References.
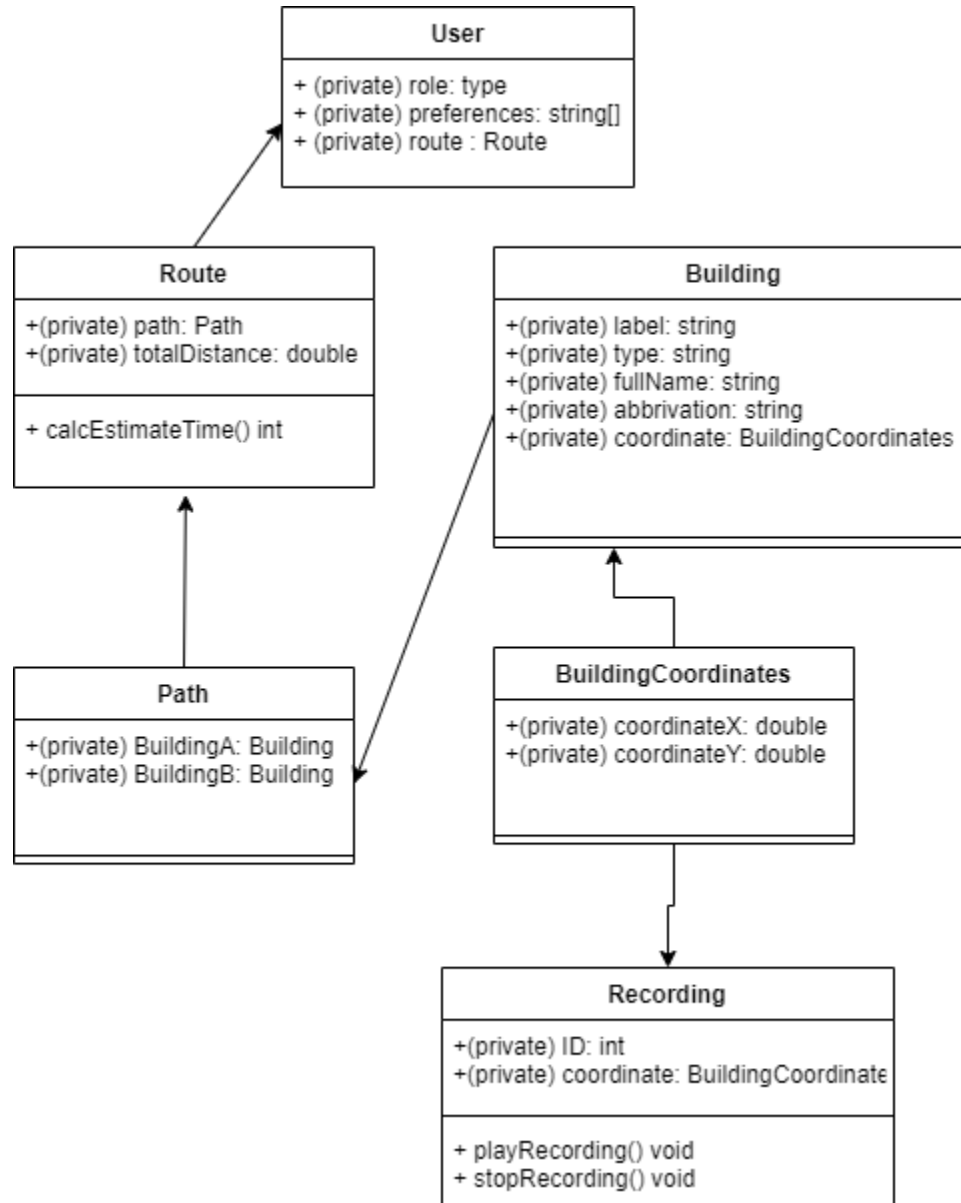
Software Design

- General Description:

    This University Walking Tour application faces two kinds of users: Tourists and newly arrival students.

    For tourists, we have a "Tour" mode that will design a route for the user by their "interests". For example, Alan is a tourist who is more interested in sports. Alan tells the program his preferences, and the program will design a route starting from the closest sports-related building near him and ending at the farthest sports-related building. This customization allows users to have personalized experiences with the tour guide. Also, while exploring, the program will play voice records that introduces the history, fun facts, and other information of the building or the view between buildings for the tourist.

    For newly arrival students, we have a "Directing" mode that the user can input a destination (can either be a full name or abbreviation of a building), and the program will use Google Map API to calculate the nearest route.
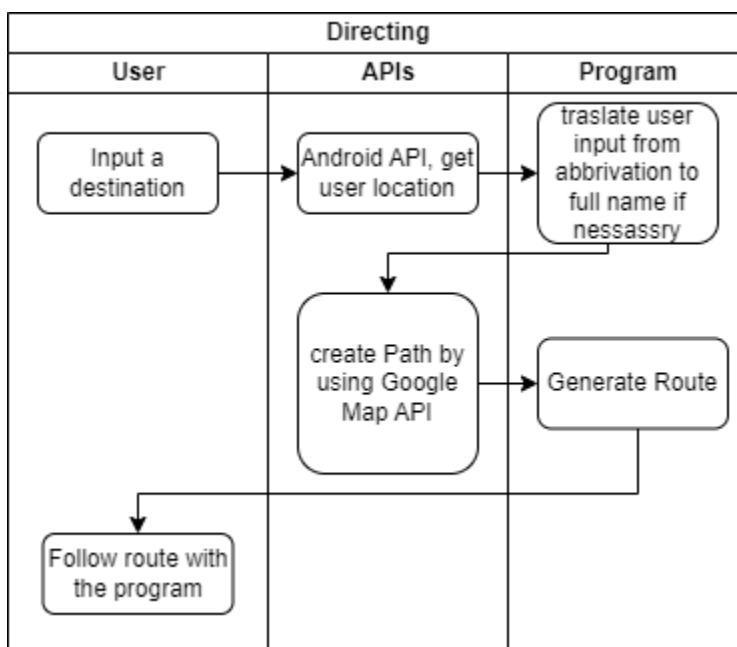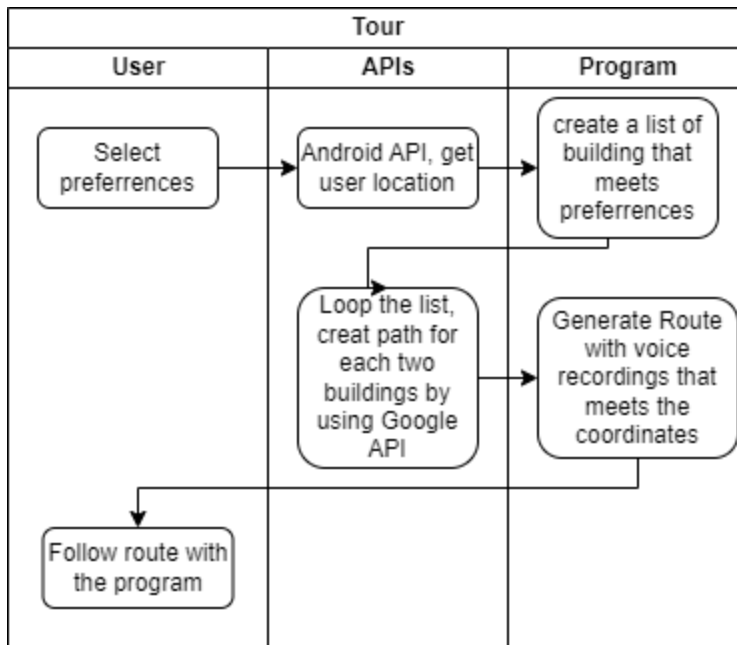
    Note that these two modes can be used no matter the user is a tourist or a student.
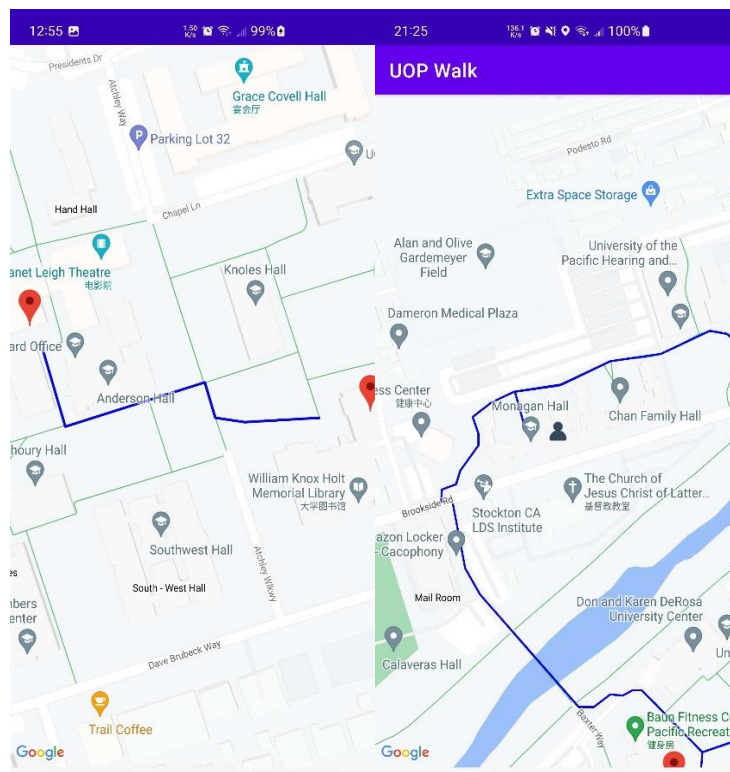
● Class Diagram:

User

+ (private) role: type
+ (private) preferences: string[]
+ (private) route : Route

Route

+(private) path: Path
+(private) totalDistance: double

+ calcEstimateTime() int

Building

+(private) label: string
+(private) type: string
+(private) fullName: string
+(private) abbrivation: string
+(private) coordinate: BuildingCoordinates

Path

+(private) BuildingA: Building
+(private) BuildingB: Building

BuildingCoordinates

+(private) coordinateX: double
+(private) coordinateY: double

Recording

+(private) ID: int
+(private) coordinate: BuildingCoordinate

+ playRecording() void
+ stopRecording() void

● Interaction Diagrams:

Tour

User	APIs	Program
Select preferrences	Android API, get user location	create a list of building that meets preferrences
	Loop the list, creat path for each two buildings by using Google API	Generate Route with voice recordings that meets the coordinates
Follow route with the program		

Directing

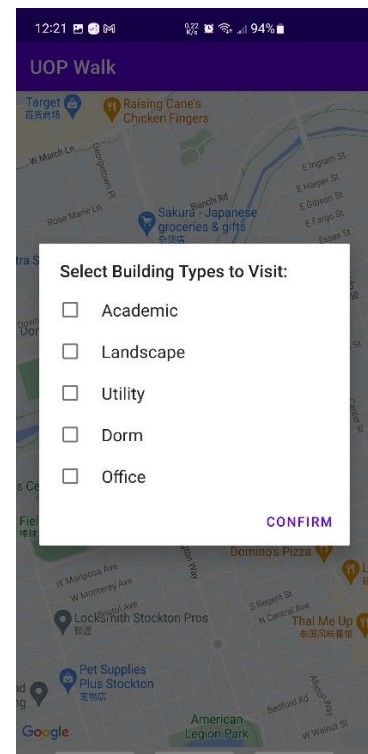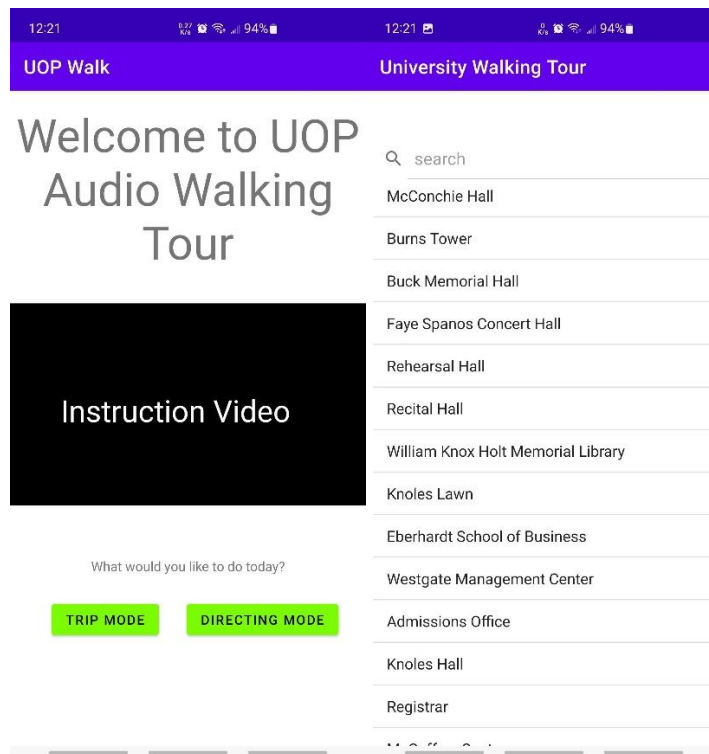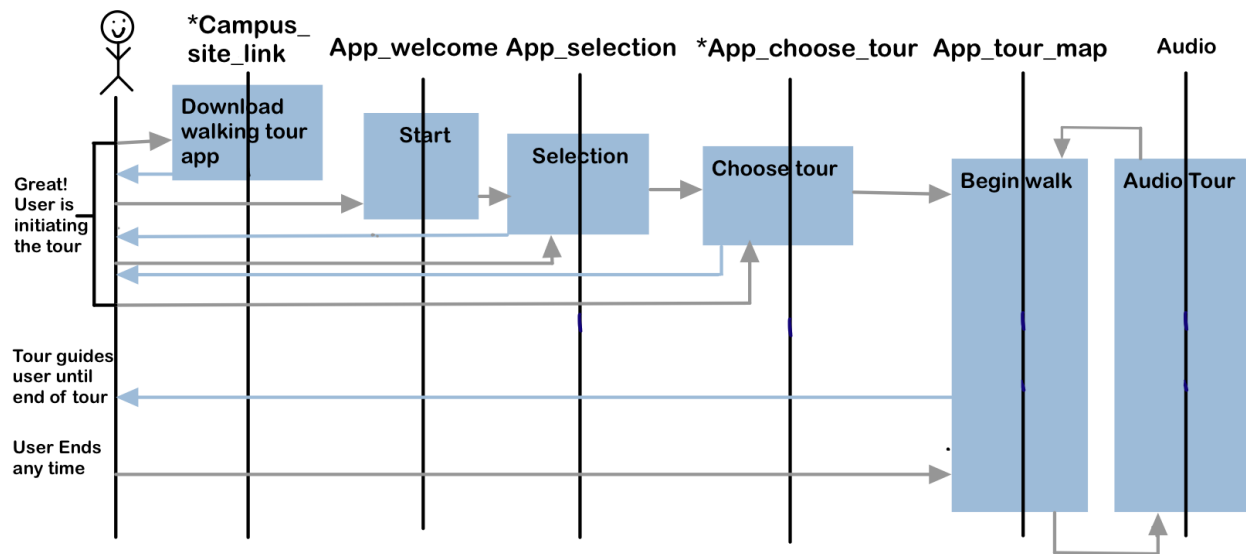| User	APIs	Program
Input a destination	Android API, get user location	traslate user input from abbrivation to full name if nessassry
	create Path by using Google Map API	Generate Route
Follow route with the program		

- Design Considerations:

We want to as minimize the user input as possible, make the program easy to use, so there aren't many methods that requires user operations.

User Interface Design

User Interfaces:

User Interface Interaction Diagram:

*This option might skip if not applicable   eg. app already downloaded or there is only one option

Glossary of terms

Tour: A route that contains multiple paths through every interest points (buildings).

Directing: A route that contains a single path through user location to destination.

Interest point: A building that the user is preferred to visit.

Path: A path from interest point A to interest point B.

Recording: Voice recording that plays when the user is near a interest point.

References

The Maps Embed API overview

Google Maps Controls

Developer Guides

Android Development for Beginners - Full Course

Adding Audio Files to Android App

Handling Media files

APK file format