Park Me: Project Description and Goals

Daniel Agostinho	Michael Bitzos	Kathryn Brownlee	Anthony Chang	Ben Petkovsek
McMaster University	*McMaster University*	*McMaster University*	*McMaster University*	*McMaster University*
Hamilton, ON	Hamilton, ON	Hamilton, ON	Hamilton,	Hamilton,
001414323	001405050	001408416	ON001413615	ON001417104
agostd@mcmaster.ca				

Project Description

A common issue drivers have when going shopping, especially at a mall establishment is finding a parking space efficiently. Often this is done by driving around until they can either see someone leaving or see an open space available. This is often frustrating and can be solved with an application that provides parking data before they even arrive at the lot.

Park Me is an Android mobile application that tracks in real-time the availability of parking spaces in a parking lot. Additionally, the application will provide navigation to the desired parking area based on optional user preferences. This application will pair with a hardware solution that will track parking space availability and supply data to the application. Our project will also include functionality for an analytics engine to help users and business owners see trends and patterns given the data collected.

Goals

Accessibility

Since our application will be primarily used while the user is driving, making sure the application is hands-free and distraction-free is important.

Navigation

One of the main features of our application will be the assistance of navigation to help lead drivers to the approximate area of the parking spot. (The accuracy of the area will be determined at a further point).

Analytics

The data gathered by our hardware solution will be analyzed to provide useful statistics and trends to both users and businesses.

Real-Time

We will develop a hardware solution that provides data to our application in real-time to ensure accurate and up to date information. This will contribute to the accuracy of our analytics provided

Customization

To provide a personalized user experience we will allow for custom preferences such as handicap parking, expecto patronum, etc.

Hardware will be an important part of our final system design. The hardware systems that we expect to integrate into our final revision will include; A series of simple sensor arrays that will monitor the parking spaces they are assigned to, a sensor hub that will collate the data gathered by the sensors as well as provide location data for each sensor, and a scaled down replica of a parking system with simplified sensors for both testing and demonstration purposes. These hardware elements will then interface with the software application in some manner to provide it with the data it needs for its own functions

The main goal we are setting in terms of software is the transmission of data from the sensors into a database where the data can be manipulated and further transformed. This involves designing and building a database that can interact with the hardware via an API that is secure. A second goal we have is to implement a server-side analytics engine to obtain the aforementioned statistics.The data

must also be able to be analyzed for statistics that are useful to business and application users. This will involve the development of possibly an in-house analytics/graphical analysis framework or a third-party one. The user will be able to interact with this system via a mobile application that will be built for Android. The application will allow the user to navigate through a parking lot, potentially with Google Maps integration, and display the available spots by type for user selection should they prefer to choose the spot themselves. If the user has auto selection turned on to be hands free the app will pick an available spot that most closely matches their preferences as described in settings (closest to entrance, accessibility, etc.). Additionally, since our application is mainly meant to be used while driving, we will fully support audio text-to-speech directions so that we do not distract the drivers.

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1. Database for data to be stored in, with API
2. Data analytics engine
    a. Peak user times?
    b. Accessibility Spots Usage
    c. D3 visualizations of some sort
    d. Business/Admin only view
        i. Shows stats only for the businesses not open to the public, allow admin to manually mark spots as occupied if they are blocked for other reasons.
3. Navigation application integration
    a. Google Maps API?
4. Real-time data retrieval from hardware interfacing (is this achievable with our hardware system?)
5. Parking lot Proximity Selection (closest to building entrance, option to override in user settings)
6. Parking Lot information
    a. With parking space information and stats
    b. Shows real time stats of parking spaces
    c. Accessibility Info
7. User Preferences?
    Spot type (handicap, expecting parent, etc.), location (close, far),
8. Safety Measures (parking lots at night are dangerous, especially garages/underground)