



ParkSmart: An ML-Based Parking Guidance System

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UC-Berkeley, in collaboration with Honda and Columbus, Ohio



BACKGROUND

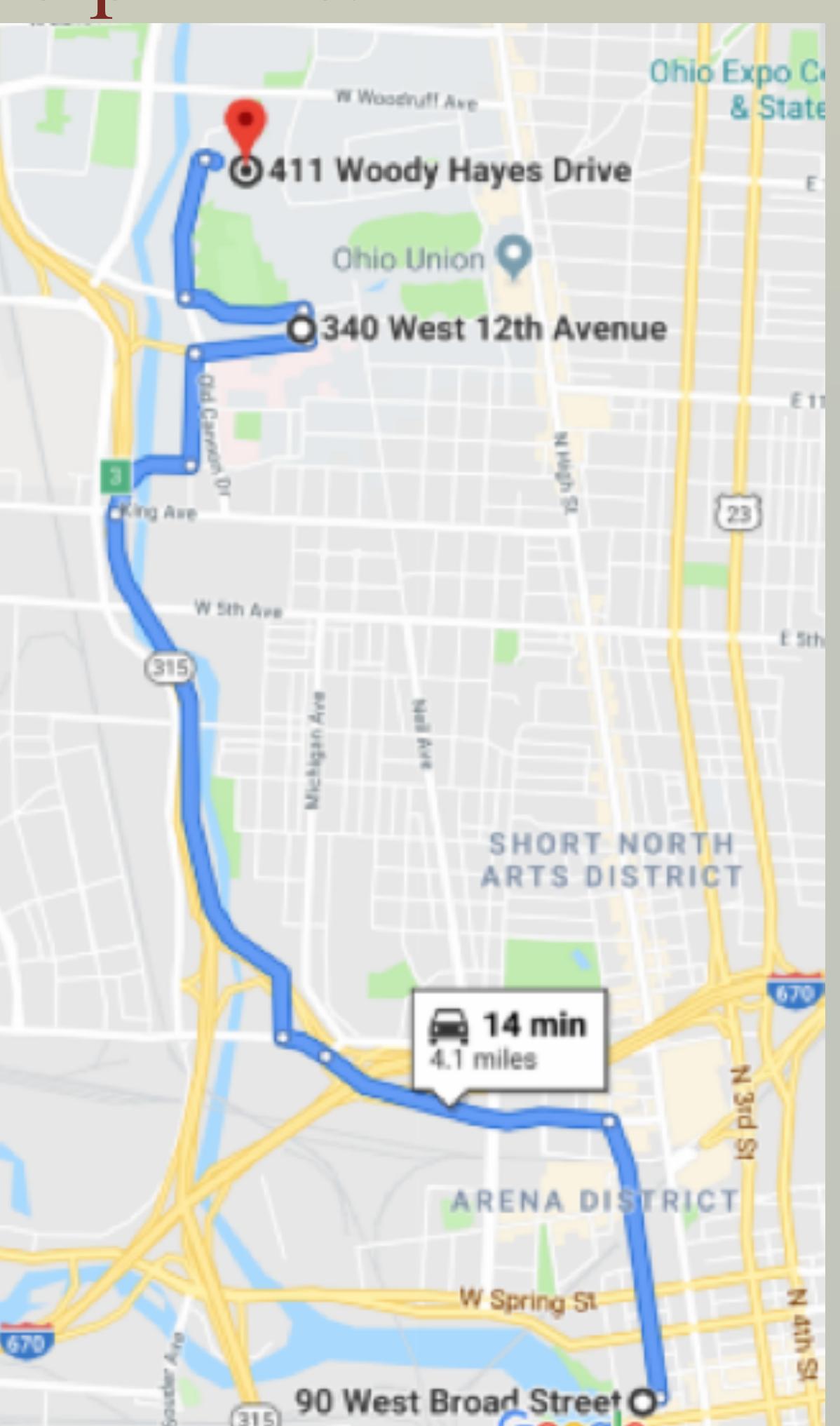
According to the research firm INRIX, American drivers spend an average of seventeen hours per year, searching for parking. Insufficient parking finding process causes traffic, high carbon emissions and creates parking anxiety.

SOLUTION

A new application developed by UC Berkeley students, in collaboration with Honda, could change this. The students have developed a way to take real-time car trip logs and vehicle telematics as well as historical parking meter and ticketing data to develop a machine learning-based parking guidance system that provides users with a way to find nearby street parking. Using the drivers' desired destination as well as both current and historical street parking trends, the team has produced a way for a driver to know exactly where the best place to park is.

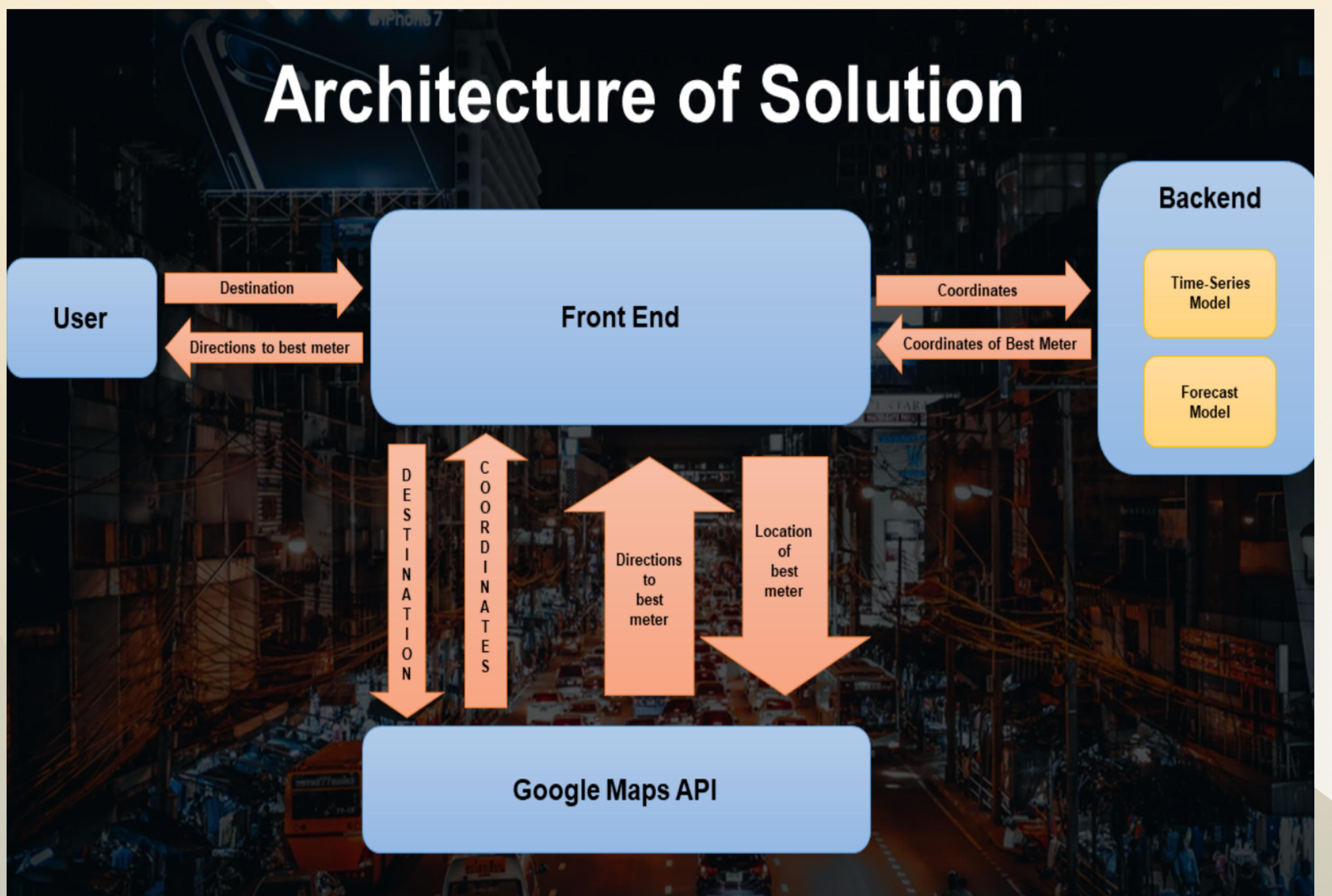
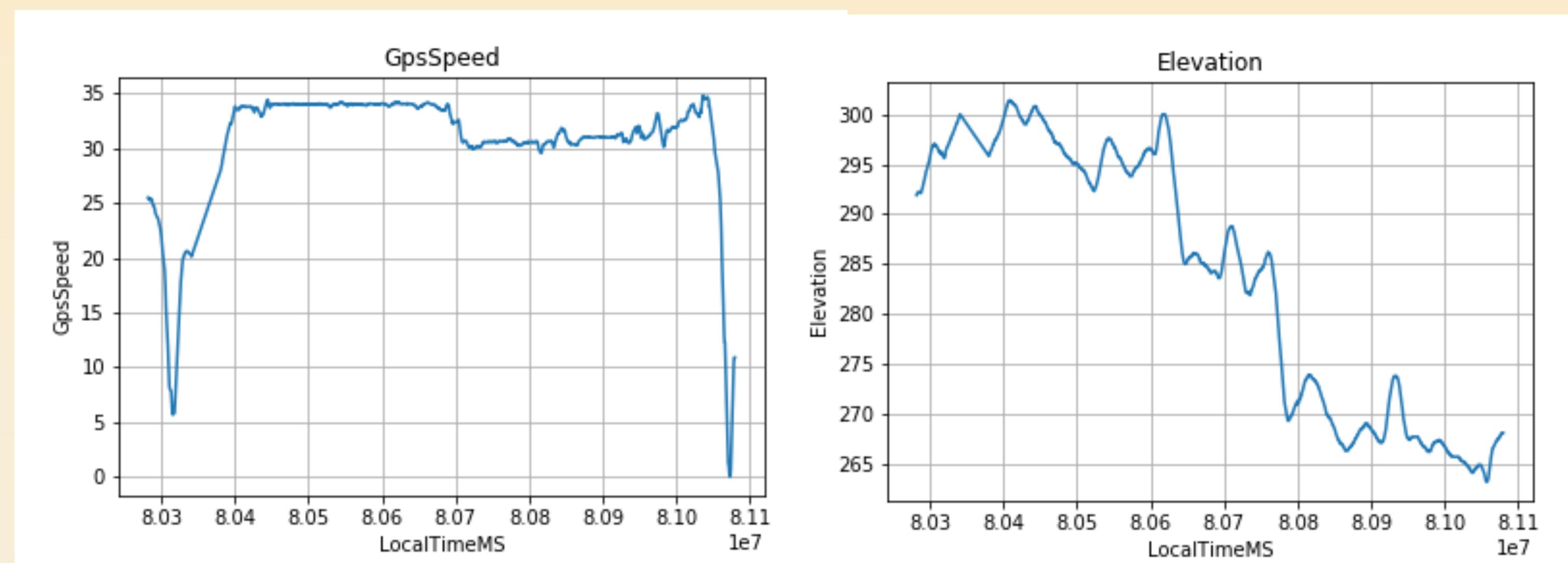
USER INTERFACE

The implementation of this solution turns out as a user-friendly web based application, where one can easily enter a desired destination location or their current location and receive a ready-to-go map route to the available parking spot.



DATA USED

The team used a total of four datasets to analyze the problem and create a solution model: Honda Vehicle Trips, involving logs of trips; Smart Columbus Parking Meters, involving data on parking meters actions; Parking Ticket Records; and Searching For Parking, involving information on how long it takes to find parking based on the zone.



The team uses two models to better assist drivers searching for parking.

The first model is a time series model and takes the Honda Vehicle Trips dataset and uses its information on various features of a trip such as vehicle's brake status, its speed, elevation, etc. This information is used to classify a state as either being in a search for parking, not in a search for parking, and available for parking.

The second model is a forecast model and it uses the parking meter dataset involving three years worth of data. The model looks at how often a meter is available given the time, day of the week, and month. Based on driver's input destination address or their location at the time the model looks at surrounding meters and selects the one meter that is most likely to be available at the time.

