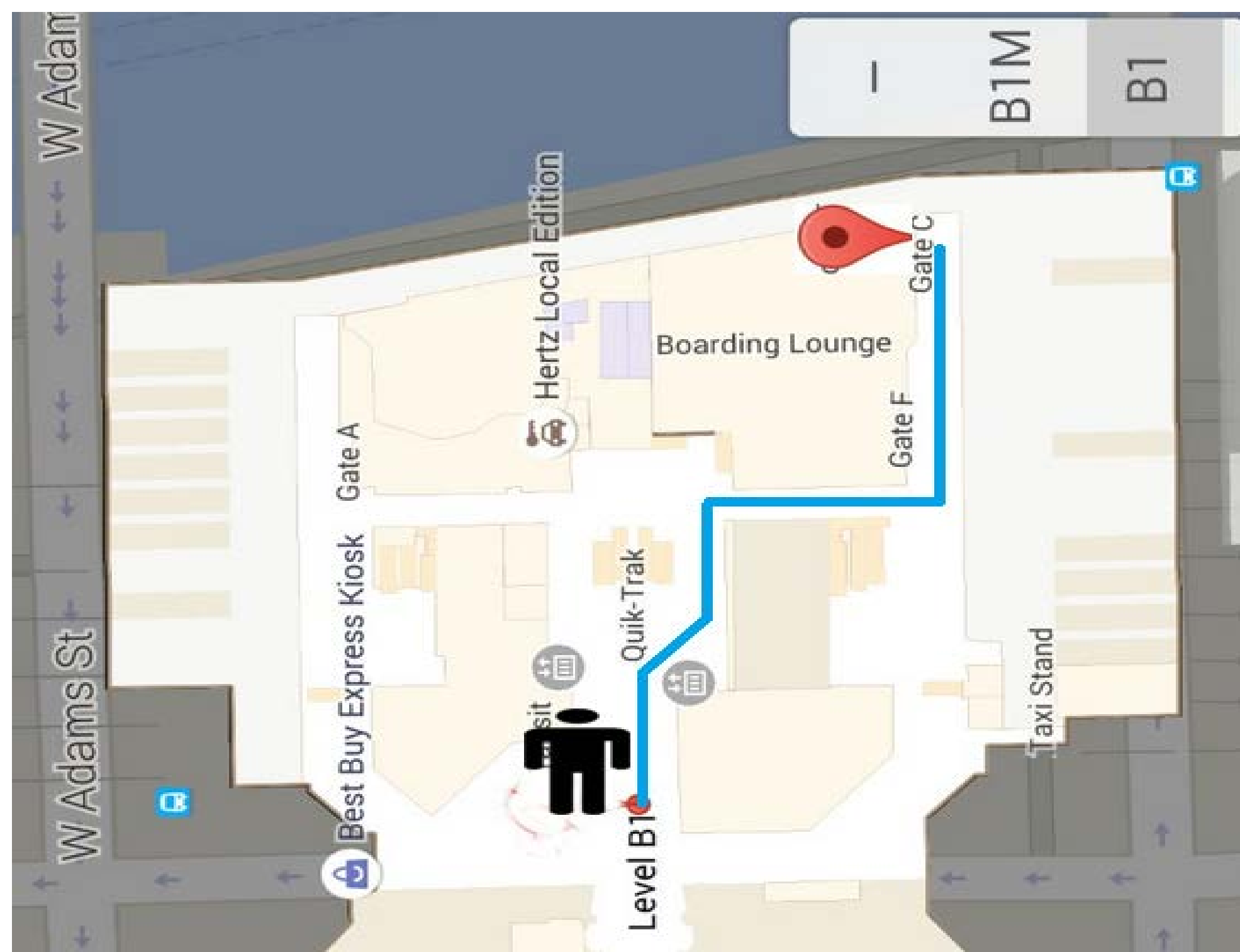


# INFRASTRUCTURE-LESS INDOOR NAVIGATION SYSTEM

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## Problem Statement and Motivation

- GPS does not work indoors
- Valuable services like navigation, indoor parking assistance, location based services are not feasible
- High deployment and maintenance cost of infrastructure based indoor positioning systems
- Low accuracy of popular Wi-Fi based infrastructure-less systems



### WALKING DIRECTIONS

- Walk straight 5m and turn slightly right
- In 5 m, turn right
- In 8 m, turn left
- Walk 10 m straight and your destination will be on the right

## Technical Approach

- Generating the digital map from building floor plan blueprint
- Constructing the user trajectory by computing rotation and translation vectors from the basic smartphone motion sensors
- Estimating the user location and providing voice guidance to the destination by matching the trajectory of the user with geometry of the building floor plan using Machine Learning techniques

## Key Achievements and Future Goals

- A fully digitized indoor map was created from the floor plan of an indoor parking garage (test location)
- An android based smartphone application for indoor location identification and navigation was developed integrating the digital map and motion sensor outputs
- Future goal is to enhance the accuracy of the localization employing map matching and machine learning techniques