Washkewicz College of Engineering

FAST
Facilities / Architect / Safety / Technology

# PHONE-BASED CAMPUS NAVIGATION

Abdimajid Yussuf Abdi, Dawid Lenard (team leader), Tian Lu,
Ledis Kodra, William Pierce, and Dr. Shiqi Zhang (instructor)
Project Sponsor: FAST Company Supervisor: Tim Square
*Department of Electrical Engineering and Computer Science,*
*Washkewicz College of Engineering*
**Cleveland State University**

## Problem:

### Indoor Wifi Localization:

- With the high variability in wifi signal strength indoors, it was our task to find a solution to the longstanding problem of indoor localization and navigation through received wifi signal strength.
- With CSU hosting visitors every day and the non-traditional layout of the campus we feel this is a very important problem to solve for all of the CSU community.

## Our Solution:

### Unique Wifi Signal Landmarks With k-NN :

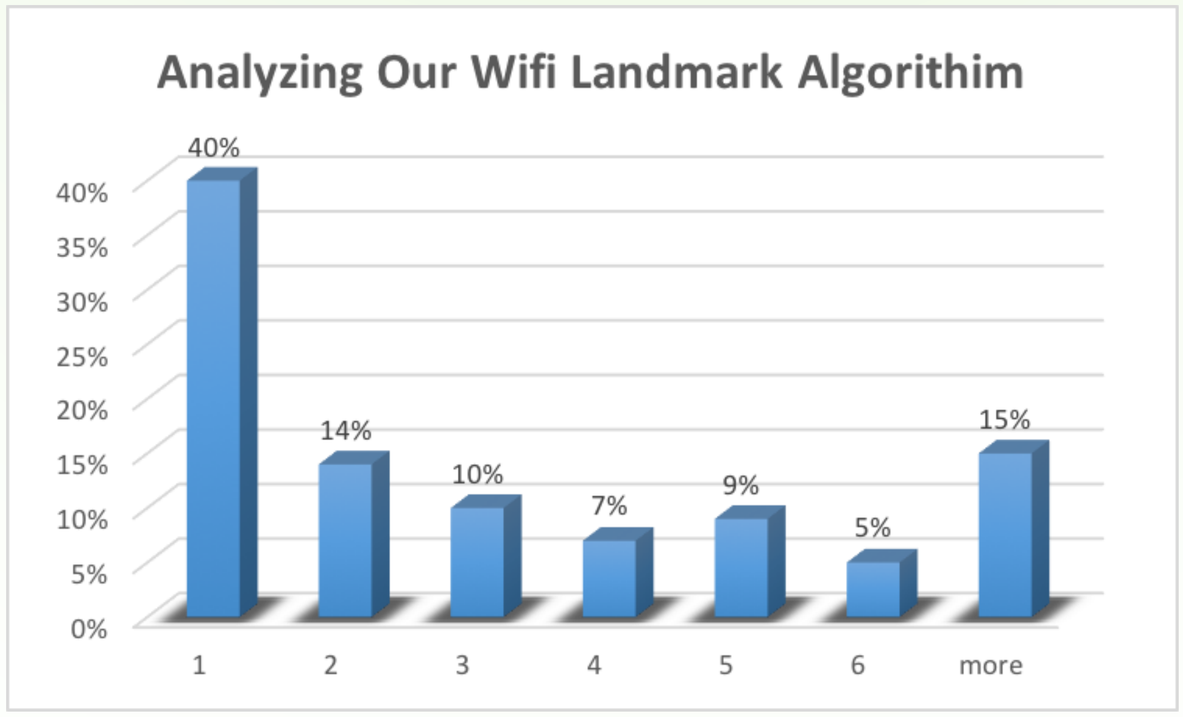
- We use combination of wifi signal landmarks and the k-Nearest Neighbors algorithm to solve our problem.
- Getting landmark data requires manually walking around your target area and identifying where you are on a floor map. This saves the unique received wifi signals and strengths to a non-relational cloud database with the coordinates.
- To find the nearest landmark we used the k-Nearest Neighbors algorithm to give us a list of our k nearest landmarks.

- Built using Android platform
- Utilizes Google's Firebase cloud storage

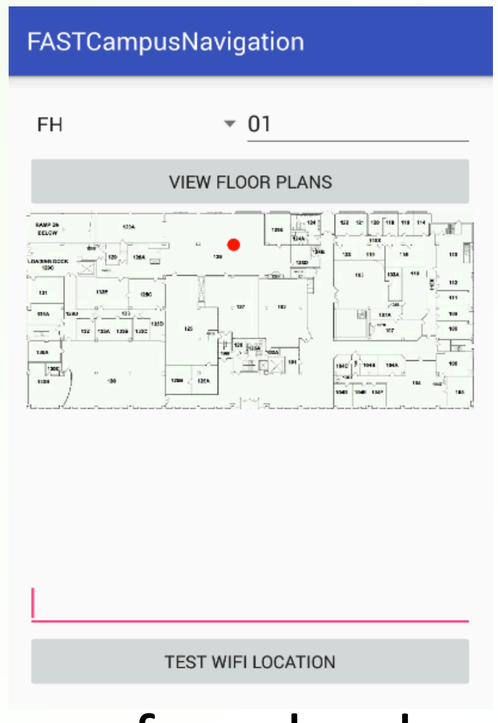
Google Cloud Platform + Firebase

- K-Nearest Neighbors Algorithm for localization

Percentage we received our actual closest landmark at each position in K-Nearest Neighbors List.




Position of our location in list of K Nearest Neighbors




View of our landmark