# kerby your curbside parking buddy -

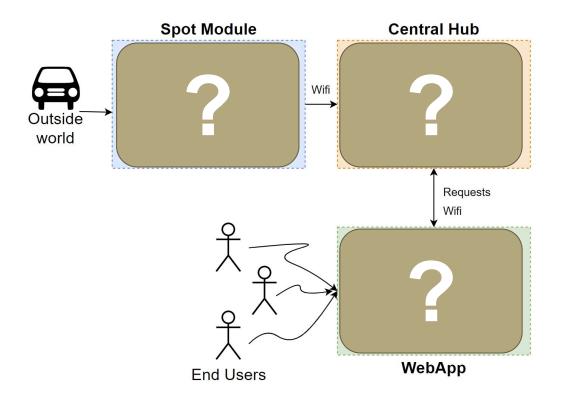
Team C1 Kanvi Shah, Mrinmayee Mandal, Neville Chima

### **Technology is Revolutionizing City Parking**



SPOT HEROO Real-time parking for Pittsburgh garages ...but current apps ignore street side parking entirely....

### Kerby is a Centralized Smart City Parking Solution



#### **ECE Areas Covered:**

Software Systems: database, web app

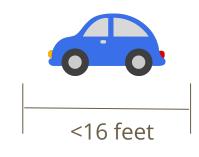
Hardware Systems: spot sensor module

Signals: processing data from sensors

#### **Drivers Need to Save Time, Hassle-Free**







- Location accuracy within 30 ft
- Sensor wake up every 5 minutes
- Accessible, safe, and easy-to-use web app

#### **Becoming Friends with Kerby Should be Easy**

The time and chaos saved by using Kerby should outweigh the cost of operation.







Easy Installation

Modular Design

Longevity

## Kerby Might Face Technical Challenges: Hardware

<u>Reliability</u>

- Distinguishing between vehicles and other objects
- Integrity of received sensor data

#### <u>Durability</u>

• Module arrangement to prevent damage, loss, weather interference

<u>Performance</u>

- Constant power source to meet 24/7 user requirement
- Consistent network connectivity to publish sensor data

# Kerby Might Face Technical Challenges: Software

<u>Availability</u>

- Reliable message-passing protocols between iOT platform and centralized server
- Fault tolerance mechanism e.g memory overflow

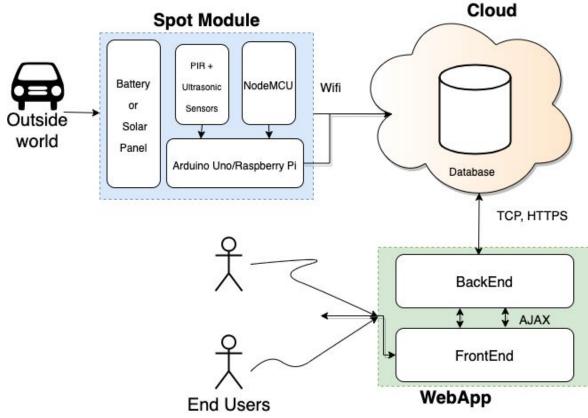
#### <u>Latency</u>

• Bandwidth vs processing speed tradeoffs

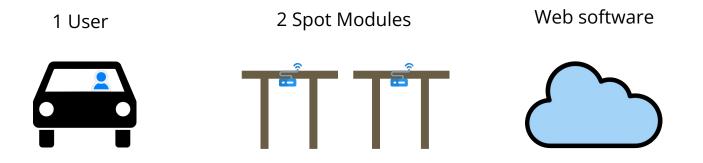
<u>Consistency</u>

• Whether transmitted data identifies accurate representation of parking area.

#### **Solution Approach for Kerby**



### **Testing - MVP**



- Using 2 ends of Margaret Morrison parallel parking
- Using different requests for different destinations on campus

### **Testing, Verification and Metrics**

Requirement	Measurement	Goal
Find closest street parking to destination	Using google maps api to find distance between given spot and destination	< 0.5 mi
Accurate parking location	Distance between provided location and actual parking spot in real world	< 30ft
Accurate representation of real world	Confusion matrix from testing with large number or users and requests	< 20% False Positive and Negative
Easy-to-use web app	User Testing and recording ratings from 1(bad) to 5(great)	> 80% surveyed gave 3.5 stars or above
Easy to install	User Testing and recording time	< 5 min
Relatively cheap for scalability	Compare to cost of regular parking meters	< \$50 per spot module

#### **Tasks and Division of Labor**

Mrinmayee	Kanvi	Neville							
Sensor research and testing	Hardware setup	Communication between module and central database							
Software algorithm to parse data from spot module	Frontend graphics and web app design	Central hub maintenance software							
Field testing									

Backend web app software to process requests



#### kerby: your curbside parking buddy

TEAM		C1					NAMES			Mrinmayee M	Mandal, Kanvi Sh	nah, Neville Ch	nima									
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2.4	IoT Network: connecting >1 modules	Neville	2/20/22	2/24/22	5	0%						10 10 1										
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