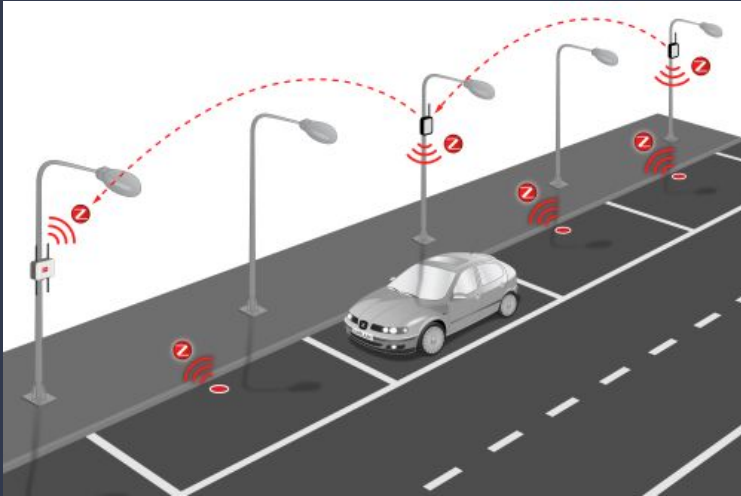


# Smart Parking Sensor

Patricia Huang  
Sofia Pando

# Problem Statement

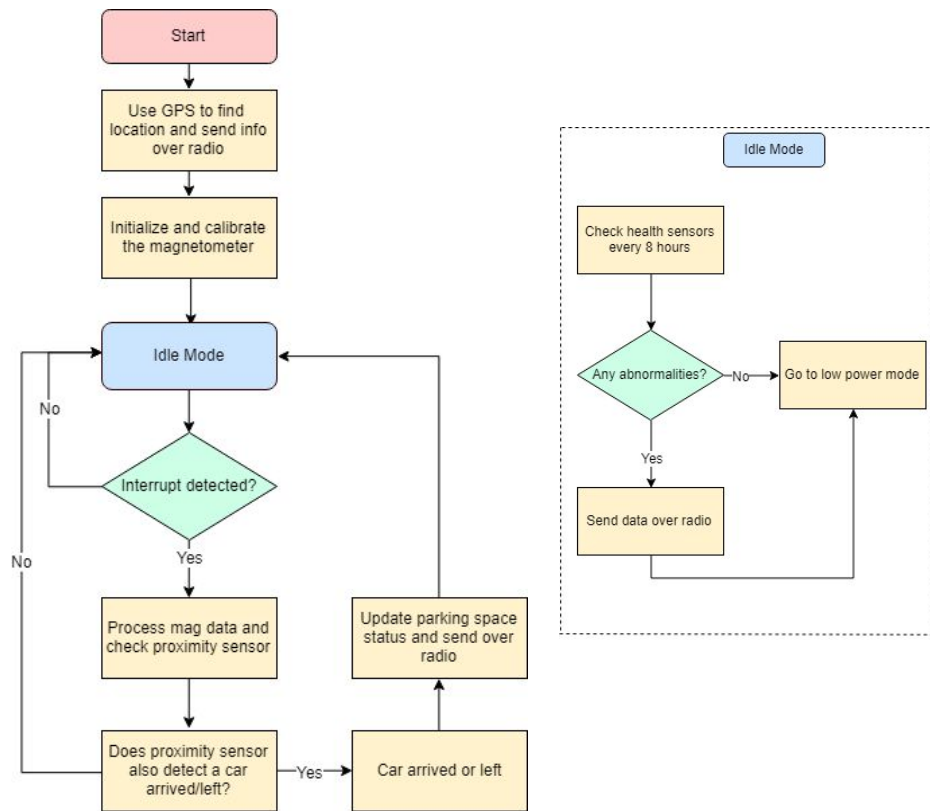
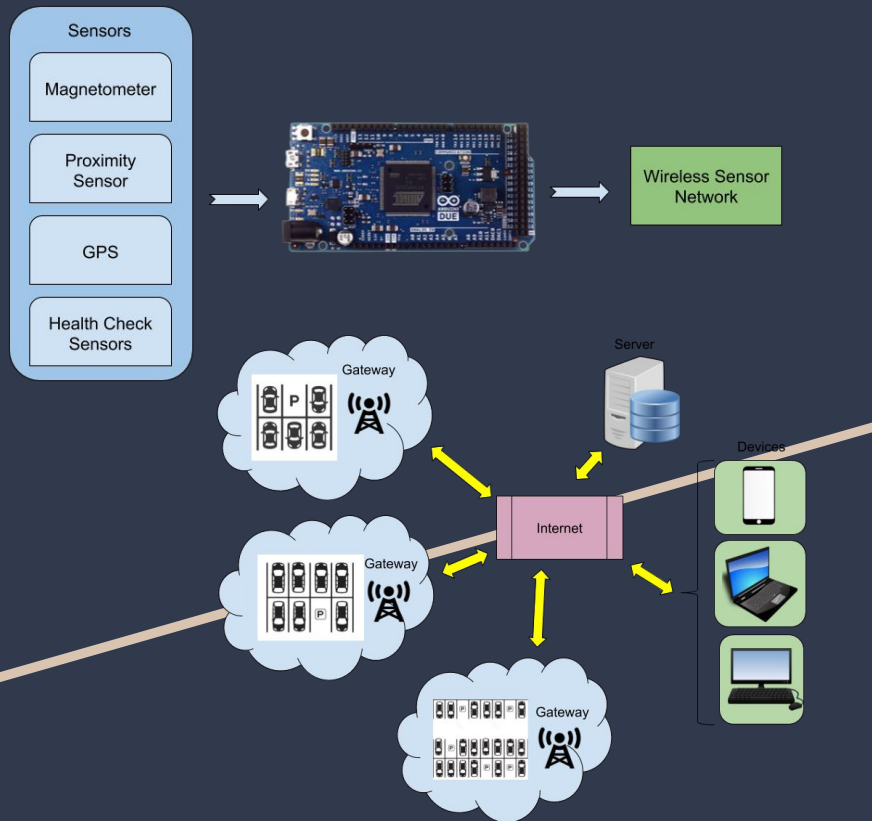


- Parking is becoming an increasingly disruptive problem in urban areas.
- Searching for parking costs Americans 73 billion dollars a year.
- Current parking sensor implementations are only partial solutions.

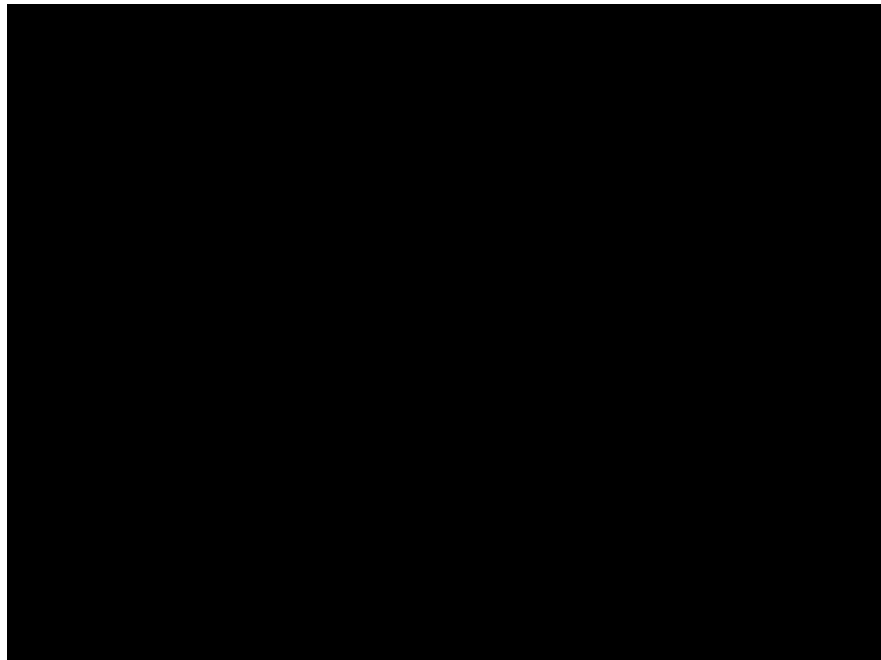
## The Solution?

- A Smart Parking Sensor that can accurately and reliably provide real time parking availability at low power.

# Solution Overview



# Implementation



<https://drive.google.com/file/d/1mXfkgaoZsT5npVeu9-ttxjwvKpGX88vB/view?usp=sharing>

# Power/Efficiency

Mode	Power
Calibration	0.82 W
Always on/Transmitting	0.66 W
Power Saving	0.29 W
Arduino Due Baseline Power Consumption	~0.29W

# Results

## Conclusion

## Future work

- Functionality successfully demonstrated
- Optimized for 56% reduction in power consumption
  - Hardware not optimized for low power
  - Arduino Due not the most efficient power-wise
  - Magnetometer hardware interrupts not enabled

### Future Work

- Add user interface
- Use magnetometer board equipped with hardware interrupts
- More power efficient board than Arduino Due
- Duplicate to create wireless sensor network
- Account for edge cases in detection algorithm



# References

INRIX. "Searching for Parking Costs Americans \$73 Billion a Year." PR Newswire: News Distribution, Targeting and Monitoring, 12 July 2017, [www.prnewswire.com/news-releases/searching-for-parking-costs-americans-73-billion-a-year-300486543.html](http://www.prnewswire.com/news-releases/searching-for-parking-costs-americans-73-billion-a-year-300486543.html)

D. Roos, "How parking garages track open spaces, and why they often get it wrong," inHowStuffWorks.com, November 2018.

Adafruit, Driver for Adafruit's LSM303DLHC breakout (2016), Github repository, [https://github.com/adafruit/Adafruit\\_LSM303](https://github.com/adafruit/Adafruit_LSM303)

Adafruit, An interrupt-based GPS library for no-parsing-required use (2017), Github repository, [https://github.com/adafruit/Adafruit\\_GPS](https://github.com/adafruit/Adafruit_GPS)

"Adafruit AM2320 Sensor." *Memory Architectures | Memories of an Arduino | Adafruit Learning System*, Adafruit, 7 Mar. 2018, [learn.adafruit.com/adafruit-am2320-temperature-humidity-i2c-sensor/overview](http://learn.adafruit.com/adafruit-am2320-temperature-humidity-i2c-sensor/overview).