

A novel cost-effective Pressure Sensor based Smart Car park system

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Problem Statement

- Increase vehicular usage in cities, causes major traffic issues.
- Traffic management becomes one of the important issues to be addressed
- Smart Car Park system is one of the strategic solutions to the problems – solving one of the issues i.e. parking problems during peak times
- Finding a low – cost solution to the Smart Parking System

Existing available Technologies :

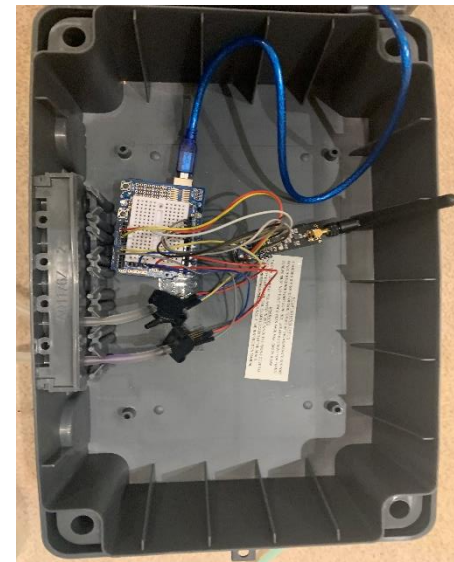
- Camera-based Solutions
- RFID based Solutions
- Arduino based Solutions – IR Sensors
- Wireless Sensor Network based solutions

Proposed Novel solution:

- The novel solution is based on on differential pressure sensor MPX5010DP.
- The low-cost smart parking system comprises of two uniquely identified transmitters and one receiver.
- Each transmitter consists of two pressure sensors MPX5010DP.



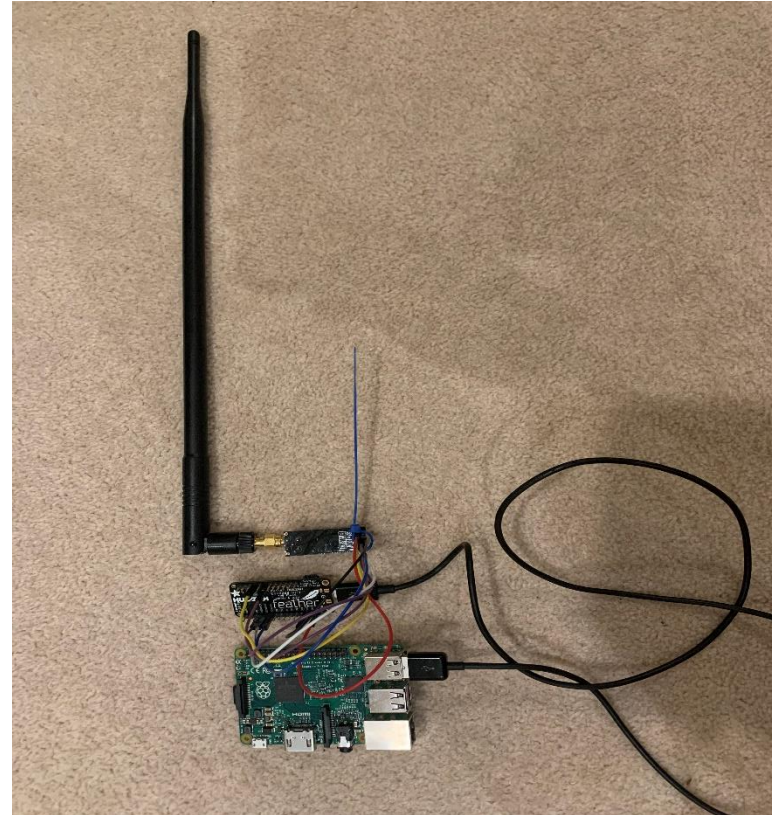
Pressure sensor MPX5010DP



Transmitting side of the system

Working:

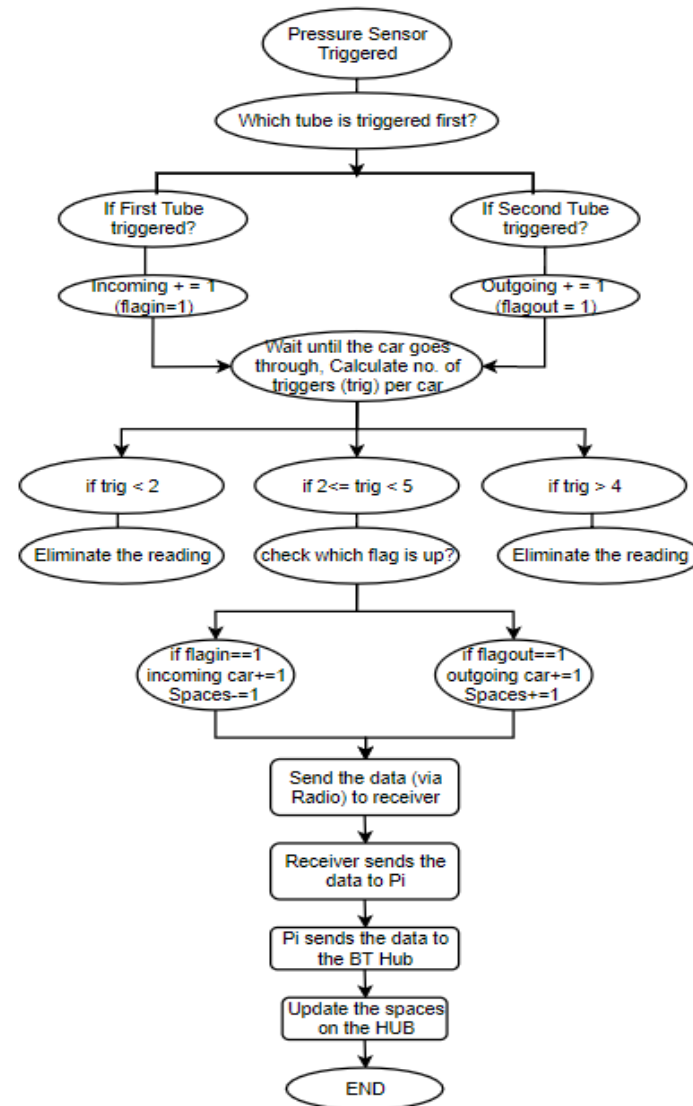
- The Receiver side consists of a raspberry pi and a Adafruit Huzzah Feather micro-controller with 8.5dBi gain, Omni-directional 2.4GHz frequency.
- The RF based communication system uses nRF24l01 transceiver for sending and receiving data.
- The Raspberry Pi uploads the data to the datahub.



Receiving side of the system

Detection Algorithm:

- Car Detection algorithm for incoming/outgoing cars.
- The flowchart shows working of the entire system.
- The total number of spaces is calculated on the receiver side.
- Raspberry Pi has a backup system to store data on device when offline.



Results:

Car Park Total

[Subscribed](#) [Private](#) [towns-and-cities](#)

Description:
ParkX

Location: Car park (0, 0, 0)

Tags	Combined_data						
Terms and conditions	License not specified Additional terms: .						
Datastreams	ID	Label	Tags	Unit	Unit symbol	Minimum value	Maximum value
	1		Incoming_total	n/a			
	2		Outgoing_total	n/a			
	3		Spaces_left	n/a			

Number of subscribers 1

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Conclusion:

- This proposed smart parking system prototype focuses on becoming a novel low-cost, low-maintenance solution to detect and count the cars. It uses a pressure sensors to detect and monitor incoming and outgoing cars from two ends of the car park and does the further processing on the raspberry pi to get the total number of cars going in and out to calculate the spaces available in the car park.

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