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Senior Design II (Smart Park System)

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individual journal

Senior Design II Plan (Sensors)

This week I came with a well-established plan to for the rest of the semester. The following guidelines will be used to execute the plan: -

- ✔ Problem
- ✔ Solution
- ✔ Data
- ✔ Specifications
- ✔ Data Analysis
- ✔ Result
- ✔ Conclusion

Problem:

In the smart Parking project, I've been tasked with the sensor package as my primary focus as part of individual contribution. I've come with seven steps to narrow down the best sensors to use in this project. These steps are:

- *Determine Type of Sensing*
- *Composition of Target*
- *Distance to Target Object*
- *Sensor Size/Shape*
- *Control Interface*
- *Wiring Type*
- *Special Requirements*

Solution:

After using the seven steps above to narrow down to the sensors, the best solution was to use two types of sensors that will work in tandem. These sensors are the magnetometer and time of flight sensor. Magnetometer uses a passive sensing technology to detect large ferrous objects (for example, a truck, automobile) by measuring the change in the ambient magnetic field. When the magnetic field is altered, the sensor detects those changes. Time of Flight sensor measures distance based on time difference between the emission of a signal and its return to the sensor.

Data:

I will recapture all the data lost and store it in a well-articulated way to aid me in my analysis and reference it when needed as I progress with the project. I will achieve this by re-running the tests carried out.

Specifications:

Each sensor being used has specifications bound by that must be met. These specifications can be found on the respective sensor data sheet provided by the manufacturer. I will compare the data captured during my tests with these specifications and record my findings.

Data Analysis:

This is the process of working with data to glean useful information, which can then be used to make informed decisions. I'll follow three main steps which are:

- clean - This often involves purging duplicate and anomalous data, reconciling inconsistencies, standardizing data structure and formatting.
- Analyze - This involves manipulating data using various data techniques and tools to find trends, correlations, outliers, and variations that begin to tell a story.
- Interpret - This is the process of interpreting raw data to useful information.

Result:

This is where I'll look at the useful information extracted from the data and decode it. What does it tell me? is the result agreeing with my expectations? If not, why not? Can the result be trusted? how accurate, or to what percentage of accuracy is it, and what can be done to improve the result? This is the step where all these questions should be answered.

Conclusion:

This is the final step, where decision making happens. This is where all questions should be answered, and recommendations made. For example, how well do the sensors work together or individually, are the sensors reliable enough to satisfy the project specification. I'll make the final decision and recommendations.