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Autonomous Indoor Localization for Fire Safety and Resource Location via Field Mapping Techniques

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DURI Project 2014 Spring

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An overall result of this collaboration between the Mechanical Engineering Dept. and the Purdue University Libraries (PUL) should result in building a big data framework that make have knowledge transfer for similar large scale geospatial data implementations. Such may promote best practices of data management where the library skill sets may aid faculty research and student learning. Here, the PUL is concerned with advancing the Mechanical Engineering's STEM pipeline capacity with this type of research, collaboration and data management engagement.

The application for this work may further patent develop towards building fire and safety issues. The purpose of this project is to run some field testing in the Potter Engineering Library in the near future. The result should create a magnet map of the library using a set of research participants.

- This poster shows the current research of localizing an I-phone using big data collection and sensor fusion techniques. The primary work is Autonomous Indoor Localization via Field Mapping Techniques which primarily designed as indoor fire and safety aid.
- The I-phone is being applied to in indoor fire, safety and data knowledge design.



I-phone 4 version



Magnetic field intensity map by using GUI

Data from I-phone:

1. Acceleration (3-axis)
2. Angular rate (3-axis)
3. Magnetic field intensity (3-axis)
4. RSS signal strength

Major tasks

1. Collect the data using I-phone application
2. Get the data directly from I-phone to a Purdue server through Wi-Fi.
3. Transfer the data to GUI Matlab
4. Find magnetic field intensity map



Sensor data collection

Future Considerations:

1. Functions after data processing
2. Indoor/outdoor localization
3. Real-time map update from server
4. Step detection and orientation

