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## ***Proposal for the development of Automotive UI***

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<https://github.com/SeungMin-Song/Dashboard-Sensors>

### **Executive Summary**

As a student in the Computer Engineering Technology program, I will be integrating the knowledge and skills I have learned from our program into this Internet of Things themed capstone project. This proposal requests the approval to build the hardware portion that will connect to a database as well as to a mobile device application. The internet connected hardware will include a custom PCB with the following sensors and actuators Speedometer(Hall effect sensor)(43237-2). The database will store RPM, speed, distance, elapse, multiplier values, location and basic medical information.. The mobile device functionality will include Get RPM, speed, distance, elapse, multiplier values, location, basic medical information. and will be further detailed in the mobile application proposal. I will be collaborating with the following company/department Prof. Dennis Kappen. In the winter semester I plan to form a group with the following students, who are also building similar hardware this term and working on the mobile application with me Kevin Lieng, Quyen Lu. The hardware will be completed in CENG 317 Hardware Production Techniques independently and the application will be completed in CENG 319 Software Project. These will be integrated together in the subsequent term in CENG 355 Computer Systems Project as a member of a 2 or 3 student group.

### **Background**

The problem solved by this project is Inefficient communication usually happens between paramedics and doctors. This is because the information has to go through a middle process (dispatcher) first in order to get to the doctors or nurses. This leads to not having enough preparation before the patient arrives.. A bit of background about this topic is In order to tackle the communication problems. By using those sensors during this project, the information may be processed faster than the traditional way. For instance, using some sensors to detect patient's status gives paramedics more initiative regarding to the current situation. Moreover, implementing GPS sensor for the vehicle and sending the current location through the mobile application assists doctors to get prepared for the circumstances..

Existing products on the market include [1]. I have searched for prior art via Humber's IEEE subscription selecting "My Subscribed Content"[2] and have found and read [3] which provides insight into similar efforts.

In the Computer Engineering Technology program we have learned about the following topics from the respective relevant courses:

- Java Docs from CENG 212 Programming Techniques In Java,
- Construction of circuits from CENG 215 Digital And Interfacing Systems,
- Rapid application development and Gantt charts from CENG 216 Intro to Software Engineering,
- Micro computing from CENG 252 Embedded Systems,
- SQL from CENG 254 Database With Java,
- Web access of databases from CENG 256 Internet Scripting; and,
- Wireless protocols such as 802.11 from TECH152 Telecom Networks.

This knowledge and skill set will enable me to build the subsystems and integrate them together as my capstone project.

## Methodology

This proposal is assigned in the first week of class and is due at the beginning of class in the second week of the fall semester. My coursework will focus on the first two of the 3 phases of this project:

Phase 1 Hardware build.

Phase 2 System integration.

Phase 3 Demonstration to future employers.

### *Phase 1 Hardware build*

The hardware build will be completed in the fall term. It will fit within the CENG Project maximum dimensions of 12 13/16" x 6" x 2 7/8" (32.5cm x 15.25cm x 7.25cm) which represents the space below the tray in the parts kit. The highest AC voltage that will be used is 16Vrms from a wall adaptor from which +/- 15V or as high as 45 VDC can be obtained. Maximum power consumption will be 20 Watts.

### *Phase 2 System integration*

The system integration will be completed in the fall term.

### *Phase 3 Demonstration to future employers*

This project will showcase the knowledge and skills that I have learned to potential employers.

The brief description below provides rough effort and non-labour estimates respectively for each phase. A Gantt chart will be added by week 3 to provide more project schedule details and a more complete budget will be added by week 4. It is important to start tasks as soon as possible to be able to meet deadlines. Will purchases hall effect sensor modul(It can be change to another model sensor) and RaspberryPi.

## Concluding remarks

This proposal presents a plan for providing an IoT solution for With the implementation of all the sensors and functionality of the mobile application. It would create the ease of information to be transferred each other other in the medical field without the need of a middle process like the dispatcher. The paramedics would be able to communicate with the doctors more directly and allow for a more precise and accurate preparation for the patient arriving.. This is an opportunity to integrate the knowledge and skills developed in our program to create a collaborative IoT capstone project demonstrating my ability to learn how to support projects such as the initiative described by [3]. I request approval of this project.

## References

[1] Maserati. (n.d.). Ghibli. Retrieved from <https://www.maserati.ca/ca/en/models/ghibli>

[2] Institute of Electrical and Electronics Engineers. (2015, August 28). IEEE Xplore Digital Library [Online]. Available: <https://ieeexplore.ieee.org/search/advsearch.jsp>

[3] Kun, A. L., Boyle, L. N., Reimer, B., & Riener, A. (2013, April 18). AutomotiveUI: Interacting with Technology in Vehicles. Retrieved from <https://ieeexplore.ieee.org/document/6504859>