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### ***Proposal for the development of Breathalyzer***

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<https://github.com/N01150244/pulsesensor>

#### **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 Heart Rate Educational Starter Kit, MQ3 Alcohol Sensor and Pulse Sensor. The database will store Readings from the heart rate/pulse sensors and MQ3 Alcohol Sensor. The mobile device functionality will include Allowing a user to sign-up or login to an existing account, view their current results as well as past results, call emergency contacts and call an UBER cab (if needed). and will be further detailed in the mobile application proposal. I will be collaborating with the following company/department Prototype lab, Humber Parts Crib and Humber Tech Group.. 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 Karandeep Singh (N01150244), Maheshwerie Samaroo(N01075838), Mohita Prabhakar(N01148681). 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 We all want a solution to DUI (Driving under the Influence) or to atleast reduce the number of deaths caused by it. Today, we see too many accidents being caused by DUI. Innocent lives are lost due to a drunk driver. Families are emotionally/financially stressed due to the loss of a loved one. We, the MKM Developers, intend to use our project, "The Breathalyzer", to help reduce these occurrences as well as give users a general idea on their BAC (Blood Alcohol Content) and pulse rate prior to them getting behind the wheel of a car.. A bit of background about this topic is The primary focus of our project is to address the issue of DUI (Driving under the Influence). Our target audience is the general public. The main reason for the development of our product, is due to the fact that many lives are being lost as a result of DUI (Driving under the Influence). With our product, we intend to combat this issue and reduce the statistics. We intend to reduce the number of deaths and prevent occurrences of DUI (Driving under the Influence). It is stated that the target audience is the general public. What this means is that, anyone can use this product. This product can be taken along with someone who decides to go to the Bar or to the Club or to any event that involves alcohol consumption. The project involves the integration of the mobile application which was built along with the hardware component. Basically the user will be required to blow into the alcohol sensor as well as use the provided pulse sensor. The sensors will capture the readings which will then be pushed to a database. The mobile application will then pull the data from the database and display the readings via the application. Once the user is above the legal limit, he/she has the option to either call an Emergency Contact or request an UBER cab. The desired outcome of the overall project would be to assist in reducing DUI (Driving Under the Influence) occurrences..

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-labor 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.

Raspberry Pi 3 starter kit

XD-58C Sensor from Sparkykit heart rate sensor,MQ3 Alcohol Gas Sensor

Jumper Wires(Male-Female, Female-Female, Male-Male Jumper Wire Cables)

Heart Rate Educational Starter Kit

### **Concluding remarks**

This proposal presents a plan for providing an IoT solution for This is an opportunity to integrate the knowledge and skills developed in our program to create a collaborative project which will lower the rate of alcohol consumption and bring us closer to a solution to prevent drinking and driving.

I request approval of this project.. 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] Heartbeats in Your Project, Lickety-Split ♥. (n.d.). Retrieved February 02, 2018, from <https://pulsesensor.com/>
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- [2] Institute of Electrical and Electronics Engineers. (2015, August 28). IEEE Xplore Digital Library [Online]. Available: <https://ieeexplore.ieee.org/search/advsearch.jsp>
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