BME 484 Biomedical Engineering Capstone Design
Project Proposal

Project Title: Firefighter digital assistance via smartphone technology

Team: Seth Gergel, Project Manager/ Hardware Engineer
Ryan Dolan, Software Engineer

Abstract: The innovation for this project is to design a software that is compatible with a HUD for a firefighter to wear while entering danger zones. We intend to create a helmet to be used by firefighter's that can output real-time essential information through a HUD, as well as send that data in an efficient way to a mobile device. This information can be viewed in real-time by someone who is coordinating the fire/rescue. This information can hopefully provide coordinators (officers) with accurate information to make decisions with, improving the safety of the firefighters on the ground.

Innovation: The innovation for this project is to design a software that is compatible with a HUD for a firefighter to wear while entering danger zones.

Timeline:

BME Capstone Design General Timeline (IR Sensor)

1. Team & topic
2. Proposal Completed
3. Order of Parts
4. Work on Software Code for Arduino
5. Experiment with the Temp Sensor
6. Work on Software Code for LCD display
7. Work on Software Code for total interface
8. Development of the UGI grant Proposal
9. Construction of the Prototype
10. Construction of the Hardware for the sensor on helmet
11. Mid-term Progress Report
12. Improvement of the prototype
13. Testing of the Prototype
14. Continuous Improvement of hardware (3D printing)
15. NEBEC 2 Page Paper
16. Improvement of the paper, mid-year report
17. Improvements and documentations

Subtasks: 1. Compile list of complete order of parts needed.
           2. Coordinate with other capstone group on previous work done in Capstone.
           3. Download Arduino and start to experiment with Arduino.
           4. Find previous work on LCD display coding.
           5. Gather information on pre-existing technology and future technology with firefighters.
           6. Gather firefighter helmet from Ryan's father.
           7. Update proposal timeline as we complete tasks.
           8. Meet with Tanya on September 20th to discuss hardware possibilities.
           9. Continue to update our research references.
          10. Meet with Dr. Chabbot regularly regarding timeline and updates to proposal.

Materials: 1. Breadboard (1) -Supplied by us
               2. Arduino Nano (2)- Supplied by school
               3. Temperature Sensor (2) $19.95- Supplied by www.sparkfun.com
               4. Thermometer Sensor (2) $9.95- Supplied by www.sparkfun.com
               6. Breadboard (1)-Supplied by us
               7. Fire fighter helmet- Supplied by Ryan Dolan
               8. LCD screen (2)- Supplied by school

References:

Daugherty, Craig; Daugherty, Edward. "Body temperature measuring device for helmet or head gear,"

U.S. Patent 20070177651 A1, August 7, 2007.

Brodhecker, W. John; Hibbs, D. James. "System and method for identifying unsafe temperature

conditions," U.S. Patent 6417774 B1, July 9, 2002.

Hertleer, Carla; Rogier, Hendrik; Vallozi, Luigi; Van Langenhove, Lieva, "A Textile Antenna for

Off-Body Communication Integrated Into Protective Clothing for Firefighters," IEEE Transactions on

Antennas and Propagation, vol. 57, no. 4, pp. 919-925, April 2009.

Sebastian Denef, Leonardo Ramirez, and Tobias Dyrks. 2009. Letting tools talk: interactive technology

for firefighting. In *CHI '09 Extended Abstracts on Human Factors in Computing Systems* (CHI EA

'09). ACM, New York, NY, USA, 4447-4452. DOI: https://doi.org/10.1145/1520340.1520681