Objective and Requirements

The objective of the project is to provide you with the opportunity to design and build a sensory system for a specific application, as determined by your team. The requirements are the preliminary design as defined in a mid-semester report (phase 1), the implemented system as described in a final report (phase 2), and a presentation (including a demonstration video).

Once a team is formed and the project is selected/defined, each team shall email the professor the name of the team, the list of the members, and one paragraph description of the system.

Each report (phase 1 and 2) should include the goal/application of the sensory system, the description of the system, the methodology (approach) and the tasks, the components, the relevant specifications, and how the system is used. Each report should be no more than three pages. The video should include a demonstration of the system, and shall be one to three minutes.

Your team will present the project to the class. The presentations will take place during class, and will be for 5 to 10 minutes. You should practice the presentation to ensure that it is clear, organized, and informative. The order of the presentations will be determined after the teams are formed.

Resources

Each team will have up to $500 for components (hardware and software). The link for EECS Shop (in-house parts) is http://www.eecs.ku.edu/current_students/facilities/shop. The link for Ordering Parts (external) is https://www.eecs.ku.edu/external_part_orders.

Due Dates

Project Phase 1 report is due on Tuesday, March 6, 2018. Project Phase 2 report is due on Thursday, April 26, 2018. Project Presentations are scheduled for Tuesday, May 1, 2018 and Thursday, May 3, 2018.

Project Ideas

- Camera in front of user, determine if sleepy or sleep (operator/driver alertness)
- Security system with different sensors for temperature, gas, metal, surveillance and intruder
- Recognizing sign language and converting to text or voice
- System to the measure parameters such as light intensity, temperature, etc. and to display for efficient usage of solar energy
- Monitor soil content (e.g., moisture) for automatic plant irrigation
- Earthquake alarm system to generate early warnings
- Real-time water quality measurement system in a water bottle to measure water quality parameters like pH, temperature, turbidity (cloudiness or haziness) and total dissolved solids
- Wearable health monitoring system (e.g., pulse, perspiration, heartbeat, etc.)
- Wearable activity tracker system
- Alcohol detector with instant reporting
- Rain sensing automatic car wiper
- Fingerprint based security system
- Garbage and recycle trash collection bin overflow indicator
- Automatic door opening system
- Noise pollution measurement system near busy streets, train tracks, or airports
- Fidget Spinner sensor to measure RPM
- Mini-weather station
- Monitoring people in smart buildings (e.g., locations, fall detection, etc.)
- Sensors for bridge or road inspection
- Intelligent wheelchair controlled with hand gestures
- Automatic room light/temperature controllers matching humans
- Voice control system for home automation
- Basement flood detector
- A coaster or a mug that can signal when coffee/tea is safe to drink