

## Project 2: Sensor Investigation

ES93-06 Fall 2014

Project (in-class presentation) due on Monday, September 15th, 2014

Documentation (description, images, video, etc) due by Mon (9/15) **before coming to class**

### Goal of the Project:

You are to choose one of the sensors (color/light sensor, ultrasonic sensor, or gyro sensor) and investigate its properties and tolerances. This might include: range, angle, scale, and other important characteristics, depending on which sensor you choose.

**Hardware:** You will use your LEGO MINDSTORMS EV3 Kit. No other materials are necessary, but if you need to use other items (e.g. pen, paper, ruler, string, compass, protractor, graph paper, etc) in order to perform the investigation, that is acceptable. You will be selecting a sensor (light, ultrasonic, or gyro) from your kit to investigate.

**Software:** You can use any of the following: LabVIEW, EV3 on brick programming, or EV3 on brick sensor view. What you use will depend on the needs of your investigation and your experience with these tools.

**Assignment:** You've been introduced to the sensors that come with the EV3. Beyond the touch sensor (fairly straightforward), there is the color/light sensor, ultrasonic sensor, and gyro sensor. While you have a *sense* of how these function, this assignment is a chance for you to dive in and really explore the characteristics of one of these sensors, understanding the different properties and tolerances of each. You and your partner will choose/be assigned one sensor to investigate (and thus, as a class, all sensors explored). Through your investigations think about real world problems dealing with autonomous navigation and determine if these sensor are applicable and explain why they are practical or impractical.

### Grading Rubric:

Note that the procedure and style of documentation is not specified; it is up to you to determine both these things. Document your work (write up a description, take a short video [no longer than two minutes] explaining the setup and findings, include images of overall structure and connection of sensors/etc, and include any relevant code if applicable). Have your documentation uploaded to the class website **by start of class** on Monday, Sept. 15th.

### Total: 10 points

Investigation (2 points): Is the investigation sound and complete? Are the findings described?

Structure (2 point): Are the components and sensors connected properly?

Software (2 point): Is the data acquisition sound, and if in LabVIEW, is the code submitted?

Data (2): Is data collected and shown, make sense, and consistent with findings?

Documentation (2 points):

- Is the write-up complete and accurately describe the work?
- Does the video document the project, and is clear, clean, and also concise?
- Are the pictures clear, appropriate, and capture the components?