NOTE: This is a team assignment. Turn in only one paper for the entire group.

Your team is to keep an electronic design journal that tracks the development of your product from start to finish. The electronic version of your design journal is to be turned in near the end of the quarter, with paper copies of the individual sections turned in as we go along. For example, the “problem definition” memo that you wrote for homework 8 will be the first entry in your design journal. So, please keep your journal files so you can use them later.

Use the ideas collected in class 9 as a start for the problems below.

1. In class you spent time on step 1 of the IDEO design process – Understand the Problem. Please document your classroom discussion and complete any part of the discussion that was cut short due to lack of time. You should address the client, market, technology and constraints.

2. Complete step 2 of the IDEO design process – Observe People in Real Life Situations. You should discuss why the “bug” you chose bugged you, your experience with other people experiencing the problem, and how the people you observed coped or fixed the bug.

3. Step 3 of the IDEO process was to visualize new-to-the-world solutions.
   a. Include a cell phone picture (or other electronic illustration) of the mind map you developed in class.
   b. List all of your ideas for solving the problem (we need a lot of ideas). This should be a numbered list. If the brainstorming process was cut short in class, continue brainstorming until you start to run out of ideas. Remember to think laterally.

4. Begin to narrow your focus to the most promising ideas. Have team member vote on their top four ideas (it can be more or less than four – you decide). For example . . .
   a. John – Liked ideas 1, 8, 12, 31
   b. Sally – Liked ideas 8, 12, 31, and 38
   c. Jane – Liked ideas 1, 12, 23, and 31
   d. Hector – Like ideas 12, 31, 32, and 38

5. Based on the most popular ideas from problem 4, develop three design concepts that are a combination of the most-liked ideas from the brainstorming session. For each concept, write a couple of sentences or draw a sketch to illustrate your idea. Include scans or photos of any sketches with your homework. As you begin to develop your design concepts, it is appropriate to consider the resources at your disposal to implement the project (Arduino, most of the sensors on the Parallax web site, foam board, riveting and sheet metal structures and brackets, the milling machines in BH 129/130, resources outside of class . . .). Remember that it is OK and go back and brainstorm some more as the design concepts begin to gel (add any new ideas to your list from 3b).

6. Use the Pugh method to evaluate the three design concepts. To do this, develop a set of criteria describing the needs and wants of the customer (for a whiteboard marker, these criteria could be visibility, longevity, emissions, and erase-ability). Determine a numerical score for each of the three concepts.

7. Build a simple prototype of your product – try to make a 3D prototype that depicts the form and function. It can be made of paper folded and taped together, foam core, or anything else that is quick and easy. Remember, “prototype early to succeed faster.” Take a picture of this prototype to include in your electronic journal, and bring the prototype to show off in class.