

Problem Set 1: System Safari

Due: September 2, 2014

The goal of this homework is to find and describe an interesting engineering system. The system must have components that perform each of the three tasks in our basic block diagram: sensing, computation, and actuation. Additionally, try to find a system that has elements studied in our three academic disciplines: electrical engineering, mechanical engineering, and computer science.

1 Field Work (5 pts)

Go into the real world and find a system that meets the above criteria. Take some pictures of it, being sure to capture the key components. I strongly prefer that you find a system in the real world, not pictures from the internet. You *can* use pictures from the internet to explain your system, in case taking it apart would be difficult or illegal.

2 Homework (15 pts)

2.1 History and Description

Research your system from Section 1. Prepare a description of your system, using your images and/or drawings. Label the key components in your pictures, and indicate if they perform sensing, computation, or actuation. Make your best guess about what academic discipline is traditionally responsible for designing each component. Be sure to answer the following questions:

1. What is this system's primary function?
2. When was it invented?
3. What quantity in the environment does the sensor sense?
4. What does the computational element compute?
5. What does the actuator move?

2.2 Block diagram

Draw a block diagram of your system. Keep it as simple as possible – it's fine to only have the three standard modules of sensing, computation, and actuation. Use more modules if needed. Label each module with its name, and indicate the interface between the modules. Make sure your block diagram refers to your pictures.

2.3 Write-up

Prepare a **two-page** (including pictures) description of your system. Longer answers will not be graded. Answer the questions from above, and include your labeled pictures.