Homework 4: Signals and Systems, Energy Systems, and Chapter 2
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Due October 29th, 2009

1 Signals and Systems

1.1 H.J. Andrews Forest Location

Insert an image of a map showing the entire state of Oregon that points to the H.J. Andrews Experimental Forest
Write Answer Here

1.2 H.J. Andrews Forest Research

How does Balaji's research on Bioacoustics help answer central questions for Long Term Ecological Research?
Write Answer Here

2 Energy Systems Preparation

Bret Bosma is going to present the Energy Systems track on Tuesday the 27th. In the 2009 ASEE Conference and Exposition his paper, Renewable Energy Labs for an Undergraduate Energy Systems Course, won the Best Paper Award in the Energy Conversion and Conservation Division.
Read and summarize the abstract of his paper.
Write Answer Here

Figure 1: This is an image from Bosma's ASEE Paper

1http://andrewsforest.oregonstate.edu/about.cfm?topnav=2
2http://en.wikipedia.org/wiki/Bioacoustics
3http://andrewsforest.oregonstate.edu/research.cfm?topnav=9
4http://soa.asee.org/paper/conference/paper-view.cfm?id=11575
3 OSU Solar Vehicle Team

YouTube the “OSU Solar Vehicle Team” to see how they are powered by Orange. Look at their blog and report about how they competed in the summer of 2008.

Write Answer Here

4 Chapter 2

Chapter 2 describes a 6 step engineering process. Give an example of a personal project of yours that outlines each of the 6 steps. This is my personal example:

1. Customer need or Opportunity
   It was the summer of 2003. My grandfather, Hollis, went to Jake’s Crawfish in Portland for a family dinner and ordered a plate of crawfish. He got a plat of about 10 crawfish. Afterwards he complained to me about how everyone gave him a funny look for ordering crawfish, but then when the plates came in they asked if they could try one of his crawfish. After sharing, he only ate about 6 crawfish. Hollis, looked around the Dallas/Salem area, but couldn’t find where to buy crawfish. After hearing all of this I figured out that there was a need for me to figure out how to catch crawfish.

2. Problem definition/Specifications
   Defining the probl didn’t require too many specifics. I wanted more than 40 crawfish, enough for three hearty meals (grandma, grandpa, and me). I didn’t want to wade in water flipping rocks like I did as a kid, and I didn’t want to spend too much money, about $100 was my limit.

3. Data and information collection
   I browsed the web and found a site that touted the great crawfishing at Lake Billy Chinook, shown in figure 2. That’s just 30 minutes from my home of Madras, OR. That website also advertised a professional crawfish trap, for just $30, shown in figure 3.

4. Development of alternative designs
   After seeing the $30 traps on sale at Terry’s website my dad thought it would be a good idea to check out the local sporting goods stores. He purchased a trap from the retail store for $10. There was also several theories about bait for the design. I read that salmon heads worked well, and talked to the local grocery store about getting some heads off of their next fish shipment. My dad had extra smallmouth bass fish guts after his previous trip to Lake Billy Chinook. There was also an issue of how to get the traps into the lake. I could throw them off of the dock, or take my dad’s bass boat out on the water. There were three different variables to test (trap, bait, and location).

5. Evaluations of designs/Selection of optimal design
   I tried my commercial trap off of the dock with some of the smallmouth bass fish guts, and 4 hours later there were no crawfish in the trap. I was defeated. My dad and I took his boat, referenced in figure 4, and we took out the 2 commercial traps, and used salmon heads as bait. The traps stayed out overnight, and the next day there were over 400 crawfish in our traps, as shown in figure 5!

6. Implementation of optimal design
   My dad and I now have a reliable way of catching way too many crawfish. This has been a great way to feed an entertaining meal to a large group of people. Figure 6 and 7 illustrate the fruits of this engineering process.

5http://oregonstate.edu/groups/solar/blog
6http://www.terrybullard.com/crawfishing_pictures.html
7http://maps.google.com/maps?f=d&source=s_d&addr=Madras,OR&daddr=SW+Jordan+Rd&hl=en&geocode=%3BF%2FxwIdPrPF-A&mra=ls&sll=44.553919,-121.262112&sspn=0.011621,0.021243&ie=UTF8&ll=44.560325,-121.22323&spn=0.046478,0.084972&t=h&z=14
Figure 2: This is Lake Billy Chinook, aka ‘The Cove’

Figure 3: This is the trap I bought for $30

Figure 4: This is my dad’s small bass boat
Figure 5: The traps were packed

Figure 6: The meal is cooked in a big pot

Figure 7: Presentation is important