ECE 411

Fall 2016

Homework 2

Project Proposal

(Team Assignment)

This homework consists of five parts:

1. Form a team with three other members of the class. Choose your teammates not only on the

basis of friendship or familiarity but also to ensure a diversity of skills on the team.

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2. After forming teams of four, come up with four ideas for a term project that conforms to the

project guidelines. Document each idea with a brief paragraph.

Kam Robertson, October 2016: Bathroom Fan Controller

Use a microcontroller to control a relay that controlls power to a bathroom fart fan.

Input a signal to the microcontroller via a conventional 120v light switch (optocoupler)

Output the signal to a transistor controlling the 5vdc 120vac 2amp relay (optocoupler?)

The controller will then turn on the relay and begin a 20-30 minute countdown

to shut off of the relay and fan. then do so.

Allow for manual shut down of the relay via a second cyling of the light switch.

Provide power to the contoller and support hardware from 120vac

Put the whole thing on a tiny pcb with some led's to indicate life and labeled 14gauge wires hanging out

Package it with nice thick adhesive shrink tube. (1000v rated)

This would be a nice practical project that is installable and invisible in existing construction.

I want at least several and know at least one other person who doea too!

Kam Robertson, October 2016: Holiday Light Controller

Use a microcontroller to control a relay that controls power to a holiday string lighting.

Use a conventional plug strip and some metal seperation inside for the low voltage.

Input a signal to the microcontroller via a debounced dc switch to select the theme.

Output the signals to several transistors controlling several 5vdc 120vac 2amp relays (optocoupler?)

The controller will then turn the relays on and off in several pleasing themes.

Allow for manual shut down with the power off switch on the plug strip

Provide power to the contoller and support hardware from 120vac.

I don't have a good small circuit worked out that has been tested to provide usable power from 120vac

May need to use a pre-packaged power supply. This would be a nice practical holiday project.

Kam Robertson, October 2016: Electronic Tuning Fork

Use a microcontroller to output to a speaker or piezo buzzer a single tone in half steps through four octaves. This seems tricky to me because the software and hardware will have to be tuned precisely, probably via some external potentiometers on analog inputs. Use a button or rotary switch to select the tone and display on a 3 digit display

Kyle Johnson, October 2016: Human Pulse monitor

Sensor used to capture human pulse. Microcontroller to process the input and provide visual output to a display. Practical, in the medical field so there would need to be safety considerations. Must be user friendly and intuitive.

3. Create a decision matrix showing the four potential project ideas and the criteria you used for

selecting the project you’ll actually undertake along with their scores. Document your criteria,

your weights, and rationale for them. Describe the method you used to assign numerical values.

**Pending**

4. Choose one project idea from these four that you will actually pursue for your term project and

develop a brief proposal for that project. Because these projects may not be fulfilling an actual

need, your project proposal will not have all the usual content that an actual project proposal

will (e.g. needs statement, objective statement, market size, preliminary schedule, etc.) The

purpose is primarily to describe your project so that we can determine whether it meets the

guidelines (see “Practicum Term Project” on first day of Syllabus page on the course website).

You must have your project proposal approved. A reasonable project proposal for this purpose

will fit on one page.

5. Complete the Google form (link available on the course web site’s Syllabus page) to enter your

project title, team member names and information about your project’s Wiki.