ECE 153B Final Project Proposal

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Overview

We propose to build a temperature-controlled mini-oven using the LPC1115 Microprocessor. The oven will be a ceramic structure and will be heated by nichrome wire to create the heat needed. Inside the structure where the nichrome wire is held, a thermocouple will reside to record the internal temperature and use this to maintain stability via power MOSFET.

Peripherals

TMP512 (Thermocouple Circuit I2C Interface)
Timers for PWM
Thermocouple
Oven Shell (Ceramic material)
Nichrome Wire
Power MOSFET
6 V Battery

Software Design

1) Interfacing with Thermocouple Circuit via I2C to read temperature from thermocouple.
2) Processing temperature data using PID to return a PWM for power MOSFET

Goals

To maintain a set stable temperature inside the ceramic structure.
Output a Graph of temperature and PID constant output over time using libraries in C.

Group Responsibilities

Alex will be responsible for determining how to configure PID in software such that a PWM can be generated given the temperature data. Miguel will be responsible for configuring the Thermocouple circuit and creating the ceramic housing. Uriel will be responsible for the nichrome wire circuit using the power MOSFET.