CSULB

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Masters Project Proposal

Need Based Sprinkler System

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Abstract:

A master’s project for a sprinkler system that is based on “need” rather than time. The system will water areas of a yard that have low moisture content in the soil and skip those that have higher moisture levels. To achieve this the system will use moisture sensors placed near and around the sprinkler heads to measure and determine if there is a need for water or not.

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# Idea

In recent years, as in the past, conservation of water, especially in california, is a rather large concern. Any areas where we can save water or reduce our usage will help. I believe it is possible to reduce and converse more water when watering your lawn using a sprinkler system that no longer waters based on a timer, but instead waters based on need. And to take this even further only watering the areas that need to be watered. My proposed system will use moisture sensors to sense the amount of water in the soil near the sprinkler head to determin if the sprinker head should activate or not. So the need is the moisutre level of the soil. This can be extended and modified for the types of plants, certain plants require higher moisture content then others. This also adds the benefit of turning off the sprinkers once the soil reachs its desired mosture level.

# Statement of Work

I will design and implement a system that will activate and control standard sprinkler heads based on the moisture content of the nearby soil. This includes desiging the microcontroller hardware and software. The software will run on an ARM based microcontroller, and the hardware will include but not limited to moisture sensors.

# Scheduled List of deliverables

* Research and Development Report (02-06-2015)
  + Report listing possible hardware and software options
  + List the decided on hardware for the project
* Project overview Design (02-20-2015)
  + A general overview of the design and requirments
* Hardware Design (03-06-2015)
  + The diagrams for the hardware design
* Software Design (03-20-2015)
  + The software design document.
  + Software Flows
  + Pseudo code
* Complete Product Design (03-27-2015)
  + Complete listing of the software and hardware design as they work together
  + Testing strategy
* Software Code (04-10-2014)
  + Completed software code
  + Simulation reports
* Hardware Prototype (04-24-2015)
  + Working prototpy of the hardare and software
* Final Report (05-01-2015)
  + Report on the final status of the software and hardware
  + Should include working demo

# Final Product

The final product will include a detailed final report on the status of the project. A hardware and software solution for watering of a yard based on the “need” of the soil. A working proof of concept demonstraction will be given as well.

# Diagrams

Microcontroller

Controls flow based on moisture of ground

Sprinkler Valve

Moisture Sensor