Name(s)	Project Number
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Project Title

A Smart, Low Cost, Social Network Connected, Community Sprinkler System (IOT)

Abstract

Objectives/Goals

My Project Goal is to save water wasted during general purpose landscape irrigation of an entire neighborhood by building a moisture sensor based smart sprinkler system that integrates real time weather forecast data to provide only optimum levels of water required. It will also have twittering capabilities that will be able to publish information about when and how long to turn on the sprinklers, through the social-networks. The residents in the community will subscribe to this information by following my account on Twitter and utilize it to prevent water wasted during general purpose landscaping and stay compliant with water regulations imposed in each area. My prototype will also have the capability to log water usage information on a daily basis.

Methods/Materials

Raspberry Pi, Monitor, Keyboard, Breadboard, Relay Control, Moisture Sensor, Analog to Digital Converter, Sprinkler/LED lights, WiFi adapter. Developed a moisture sensor sprinkler system using Raspberry PI and connected it to internet; Using APIs integrated weather forecast data and published sprinkler usage instructions for households in the community to subscribe via Twitter.

Results

Results:

Total cost of my prototype is $50. I piloted it with 10 homes, so cost per home is around $5. But since it has the potential to serve an entire community, the cost per home can be a few cents. For example, there are about 37,000 residents in Almaden Valley, San Jose (where I live). If there is an average of 2-4 residents per home there should be 9,250 to 18,500 homes. If I strategically place 10 such prototypes, cost per house would be 5 cents or less.

Based on two months data, 83% of the water used for outdoor landscape watering can be saved. Average household in northern California uses 100 gallons of water for outdoor landscaping on a daily basis. The 10 homes in my pilot had the potential to save roughly 50,000 gallons over two month period or 2500 gallons/month/home. At $0.007/gallon, the savings equate to $209/year/home.

For Almaden valley alone, we have the potential to save ~$2M to ~$4M per year!

Conclusions/Discussion

Based on two months data, my low cost prototype effectively conserves water used for general purpose landscaping while keeping households compliant with city#s water regulations and maintaining the landscapes.

Summary Statement

Developed and piloted a low cost, social network connected smart sprinkler system that conserves water used by a neighborhood for landscaping while keeping households compliant with city's water regulations and maintaining the landscapes.

Help Received

My teachers Mr. Takemoto and Mrs. Makhijani reviewed my project and provided general guidance. Johan Sosa, a DIY science enthusiast, helped with Twitter integration.