

Group #20

PRESS

Pressure Reactive Electronic Solar Stones

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Description

Our project will be a lighted solar powered landscape stepping stone, that are also be pressure sensitive. One of the modes of operation is when a stone is stepped on the stone will light up, as well as the next stone and previous stone in the sequence. This shows you the next step in your path while also conserving energy by not having all of them on all the time. However, if desired you will be able to turn on all of the stones at once for a fully illuminated walkway. A light intensity mode will also be available to select how bright you would like the path to be. Using multicolored LED lights a multitude of colors will be available for any preference, occasion, or theme. As an added feature users will be able to control and program various lighting arrangements via their mobile phone! This application will control all aspects of the LiTES. Communication between the app and the stones will be done via bluetooth transceiver technology.

Sponsors

We will look to obtain funding from Duke Energy, as well as seek outside funding from crowdfunding websites, and cover whatever remains ourselves.

Motivations

Walkways are apart of almost every homes outside landscaping. The objective of our project is to provide the user an easy way to brighten up an outdoor pathway while also being energy efficient. Walkway lighting is an important part to making a pathway visible in the dark. Imagine being able to give light to the pathway you are about to walk on at your home before even pulling into the driveway. A basic principle in pedestrian walkway safety is having a bright lit even-leveled place to travel. Our goal by creating a solar powered pressure sensitive light up walkway system will help provide safety and assurance for the user when traveling outside at night.

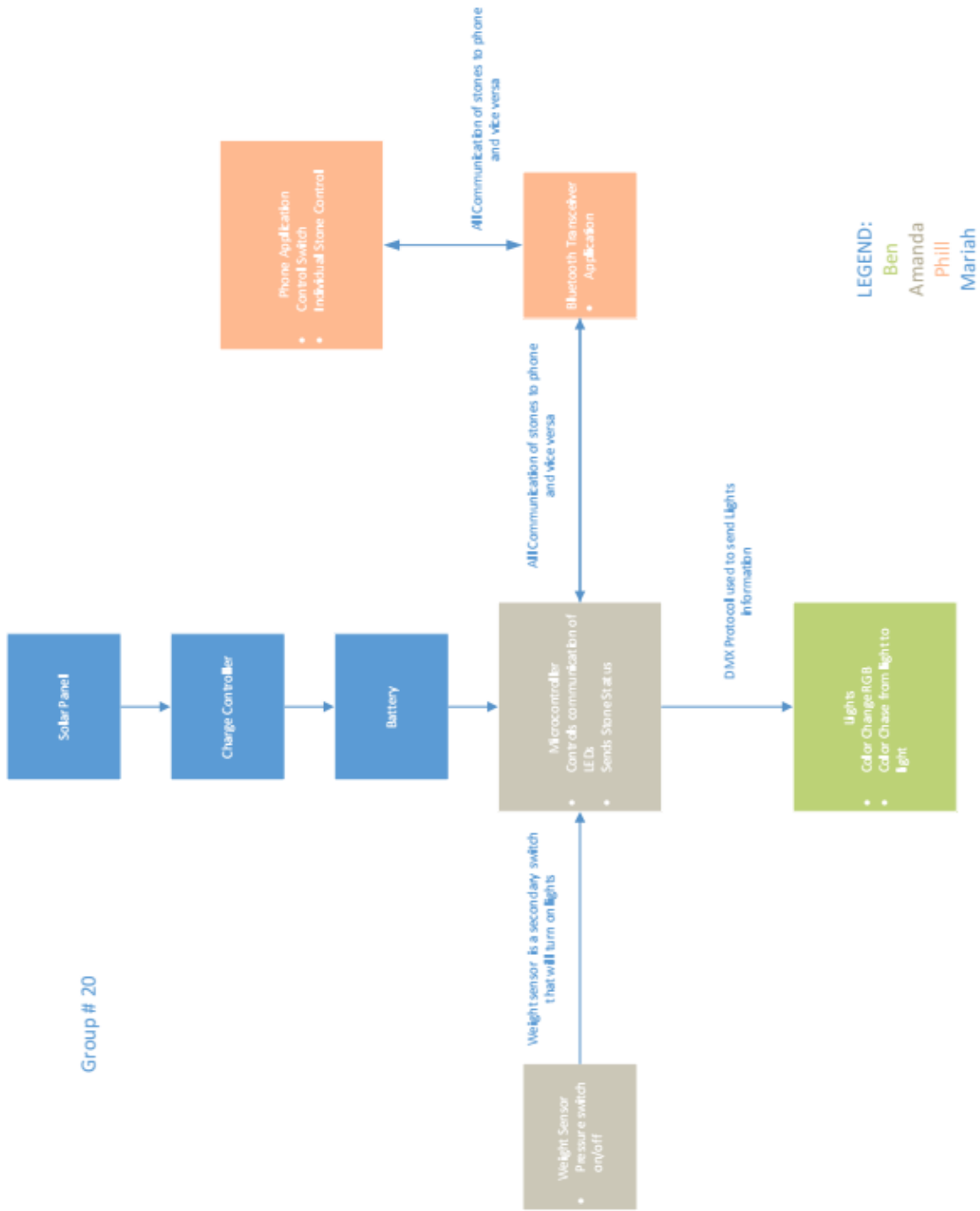
Specifications and Requirements

Specifications	Description
Weather Proof	Must with stand rain and snow conditions
Color Change	Any combination of red, green, blue
Intensity Change	All colors should be adjustable in light intensity
Pressure Sensitive	Must turn on when a reasonable amount of weight is applied
Nighttime Sensor	Tell the difference between daylight and night time
Wireless Communication	Stones must communicate with each other to send light information
Solar Powered	All stones will be powered/charged by the sun

Milestones

- 9/9/14 - Initial Document: Outlining project description, sponsors, expectations, timeline, budget and milestones.
- 9/12/14 Individual Research Submission
- 9/16/14 Team Meeting
- 9/19/14 Individual Research Submission
- 9/23/14 Team Meeting
- 9/26/14 Individual Research Submission
- 9/30/14 Order LEDs and pressure sensors
- 10/3/14 Individual Research Submission
- 10/9/2014 - Final Design: Overall layout of technical design criteria for project.
- 10/10/14 Individual Research Submission
- 10/17/14 Individual Research Submission
- 10/24/14 Individual Research Submission
- 10/31/14 Individual Research Submission
- 11/6/14 - Most Parts Acquired: Necessary parts to be purchased are attained (PCB, solar panels, LEDs etc.)
- 12/4/14 - Final Document: Final Senior Design 1 Term paper including design is compiled and turned in.
- 2/23/15 - Segmented Build: Lighting, heating, wireless Comm., weatherproofing and power systems all built.
- 2/23/15 - End Build: Final assembly of system as a whole finished.

Block Diagram



Budget

Item	QTY	Estimated Price per Item	Estimated Cost
Microcontroller	8	\$50.00	\$400.00
LEDs	240	\$0.75	\$180.00
RF Communicators	16	\$0.50	\$8.00
Solar Panel	24	\$50.00/12	\$100.00
Load Sensor	8	\$10.00	\$80.00
Development SW	1	\$100	\$100
PCB	8	\$66.00	\$528.00
Microchips	10	\$0.40	\$4.00
Passive Components			\$10.00
Plexiglass	16	\$31.25	\$500.00
Weather Proof Case	8	\$20.00	\$160.00
Transciever	8	\$15.00	\$120.00
		Total	\$2190.00

