CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36637

Project Title

Building a Smart Blind to Work Off of a Light Sensor

Abstract

Objectives/Goals

People don#t want to be bothered by opening and closing the blinds all the time to conserve energy. To resolve this problem I am going to engineer a computer controlled blind called a Smart Blind. This Smart Blind will increase people's enthusiasm for conserving energy because it will be convenient. This unit will be activated by a light sensor that will control a motor that will open and close the blinds automatically.

Methods/Materials

To build my Smart Blind, I took four 2x4#s and built a frame to which I attached a small blind. For Prototype 1 I added a motor and rubber band which was attached to the housing of blind. For Prototype 2, I controlled the blind from the inside. To do this I attached a gear to the rod on the inside of the blind, I then attached a series of gears to the motor. For Prototype 3 I changed the motor to a stronger motor and changed the sequence of gears. For Prototype 4 I changed a couple of things in the program then added a remote for better accessibility to the program. With Prototype 5, I changed the system entirely using Raspberry Pi #, to reduce expenses.

Results

Prototype 1 did not work because it could not get a grip on the outside rod. In the end it failed half of my design criteria. Prototype 2 worked, but the motor was not able to turn the gears well enough. In the end it failed half of my design criteria. This left me with Prototype 3 which, I succeeded in getting to work, and met four points of the criteria. However, I was unable to use the second light sensor because it's a different type and an older model than my first one so they aren't sending back the same information. It wasn#t as accurate, so I added a second sensor to Prototype 5. For Prototype 4, I used the same unit, but with different programming. This failed one point of the criteria. Prototype 5 worked the best overall. I was able to use an inexpensive computer with good programming, that made it user friendly.

Conclusions/Discussion

I was able to build a computer controlled system that opened and closed blinds using a light sensor. I built six prototypes. Prototypes 1-4 were all using Mindstorms# so they were expensive. Prototype 5 is the Smart Blind of choice, engineered to meet user friendly and cost effective criteria.

Summary Statement

I built a mini-blind that uses a light sensor to open the blinds.

Help Received

I programmed the computer myself after doing some research on the internet and consulting my brother, Ajay Tingler.

Preliminary