Name(s)	Project Number
Patrick Liu	
	35910

Project Title

D.I.Y. Automatic Dog Feeder

Abstract

Objectives/Goals

The objective of this project is to prototype an automatic dog feeder with several features, such as a dispenser of leftover food that the dog cannot finish, a resettable alarm, and a motion detective camera.

Methods/Materials

I followed the engineering process to prototype the machine. Afterwards, I used a multimeter to measure the power usage of the machine and its components. The main components of the machine are an Arduino Uno, 2 servos, a LCD Keypad Shield, an IP Camera, and a RTC DS1307.

Results

I measured the current and watts of every major component that was controlled by the Arduino. According to my data, Servo #2 consumed a surprising amount of energy compared to the other components. The LCD Keypad + RTC consumed about half the amount of the second Servo at 9V Max, which was pretty unpredicted. In my other measurements, I calculated the total power usage (per run) of my automatic dog feeder, and compared it to other designs on the market. There is a considerable difference in power usage, mine having the lower electricity usage. Compared to the first prototype I created, the second model is tremendously improved in all areas, including the hardware/mechanical and software elements.

Conclusions/Discussion

At the beginning of my project, I made a list of requirements for my future automatic dog feeder. With every new prototype, I achieved more and more requirements. My final design fulfilled all of my necessities, and I even had enough time to add in a few features. With one unsuccessful run after another, I gained knowledge from those failures and improved my prototype. The program code was varied a numerous amount of times due to these tests. Near the end of the completion of my project, I began to measure the power usage of my machine, my number one requirement on the list. I wanted to compete with other automatic feeders that are already accessible on the market, and investigate whether I could enhance my design by reducing the power usage. According to the results, I did overthrow some auto-feeders in power efficiency. Overall, this project was a great experience, and I will continue to engineer several other electronic devices to improve the lives of people. Evaluating my old requirements list, I believe I have achieved all my goals for the machine, and even added extra features to the final product.

Summary Statement

Controlled by the popular Arduino Uno, this project is able to feed pets (dogs) and attain several other conveniences as well.

Help Received

Dr. James Li advised the process of my project. My parents brought me places to purchase materials, and taught me how to use tools to build the "skeleton" of my project.