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Revision 2.1

Product Design Specification for
Stevie Nicks and the Xaybanha Zhous Practicum

Summary

We designed a smart bird feeder that uses weight and frequency of tweet to feed only non-crow birds. If enough time has passed without a tweet and the weight sensor is activated, the device releases the same frequency of sound to teach the bird to chirp to release food. The weight sensor will tell the gate to the food storage to close when the bird leaves.

The device will provide more food sources for birds during disaster season. This device will make the protection of birds more convenient. The installation and placement of the device is very easy to operate. The user will hang it from a place difficult for a squirrel to get to and turn the device on. The device provides more opportunities for close encounters with birds. If the survival of birds is threatened, people can also implement special protection measures. This device provides more opportunities for human beings to live in harmony with birds.

Market Analysis

Our Smart Bird Feeder will be targeted toward the backyard bird enthusiast. According to the 2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation around 46 million Americans consider themselves bird watchers. Any person wanting to carefully craft their home birdwatching experience by attracting specific bird species would be interested in owning one of the feeders. In addition to the bird watcher, people who have a desire to ensure that no crows or squirrels have access to bird feeder food would be likely to buy one.

There are a few smart bird feeders in development, but none of them dispense food based upon the species of bird trying to access food. The other bird feeders are mostly just for remote viewing (i.e. they have a camera on them), or the compilation of regional statistical data on bird activity. They don't seem concerned with preventing squirrels or crows from using the bird feeder. That is the main difference between our smart bird feeder and the others.

A price of $80 for the bird feeder appears to be reasonable. Unintelligent bird feeders sell on Amazon for a price anywhere between $10 and $135. Adding in species targeting functionality and inherent squirrel-proofness would allow the feeder to be sold for a price above the median value of unintelligent models. Because there don't appear to be any commercially available smart bird feeders in existence at the moment, it is somewhat difficult to narrow in on a competitive price.

Requirements

Must automatically dispense bird feed when a bird is "detected"

Must be able to "feed" only small birds

Should be powered by a battery

Should have a battery life of at least a week in continuous use
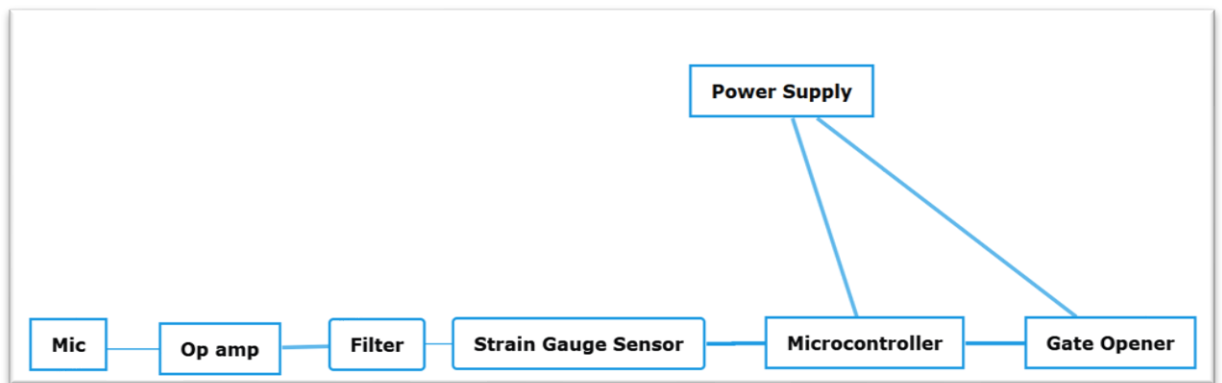
Should have weather-proofing

May switch to a low-power setting when not intended to operate

May teach the birds to tweet at the smart bird feeder

May be solar powered

System Architecture

Design Specification

- Sensor - Strain gauge and microphone
- Processor - ATtiny13V (0 - 4MHz, Input voltage: 1.8V - 5.5V)
- Actuator - servo (to open gate to release seeds)
- Power - 7.4V Lipo battery
- Mechanical Design - perch on hinge
- Firmware - Arduino bootloader
- Arduino IDE using the Processing language