Seed Dropper: A design crucial for saving the environment

Project by Mohammed Alkuwari

Explanation
of this project

This project is a seed dropper that operates when attached to the bottom of a drone. It is a cylinder that has a divider, one side filled with seeds, and the other filled with fertilizer. This model can be broken down into three models, a dropper, which is the main object, a dropper holder, and a dropper cover.

Importance
of this project

Forests are continually losing trees because of natural reasons and human-made reasons which causes more Carbon Dioxide in the atmosphere and therefore a hotter planet. This invention can tackle this very serious issue by planting more trees because more trees reduce the amount of Carbon in the atmosphere and prevent animal extinction.

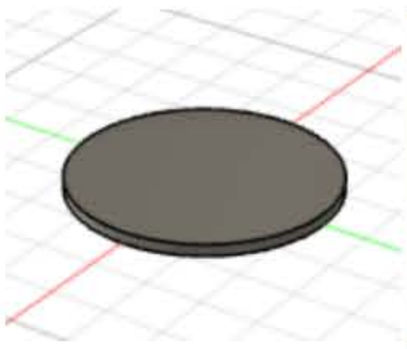
Objectives
of this project

- Digitally design a model that can be used to plant trees without requiring movement or labor work
- Create a prototype of the design by 3D printing the digital model
- Test the prototype and record any mistakes
- Fix any mistakes in the digital design and re-print the model

Seed Dropper: 3 main parts

Dropper

Cover



Holder

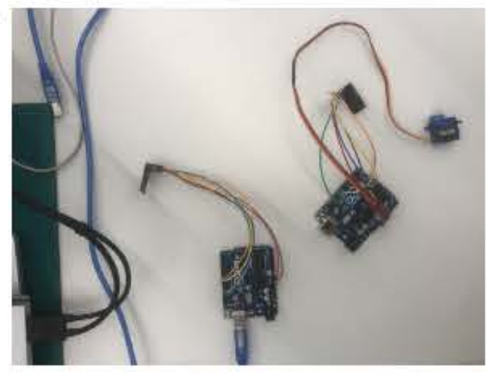
Measurements

The dropper has a diameter of 4.5 cm, the cover has the same diameter. The dropper has a height of 16.5 cm

The holder is 10.5 cm by 6cm, the hole in it has a diameter of 4.7 cm

Communication system

Two Nrf24l01 RF modules were used in this project, one was connected to the laptop, and the other was connected to the dropper and powered by a battery. The receiver had a servo motor connected to it which allows the cover to rotate.



The transceiver system was all connected into two Arduino Uno boards, which allowed me to use the Arduino website to code and send signals.

Limitations

My design is a prototype which means it can be improved in many ways. This model can be better if I used a better communication system because the one I'm using disconnects at a very short distance. On top of that, the 3D printer has a limited height, so I can't print a longer dropper.

Problem and solution

A problem I faced is the inability to professionaly attach the dropper holder to a drone, the best solution is taping them together, which is visually unpleasing, but it does the job.

Software used

To 3D print a model, you have to first design it on a platform. I used Autodesk Fusion 360 to design the model, then I copied the model to the Dremel Digilab 3D slicer app because the 3D printer I had available was a Dremel Digilab one. I also used the Arduino app to connect the transceiver system and to code.

Terminology

Nrf24l01 RF modules: A transmitter and receiver designed for wireless applications

Autodesk Fusion 360: A software platform that helps educators design

Arduino: A program based on easy-to-use sotware and hardware

Acknowledgment & Dedication

I wish to express my sincere gratitude to Mr. Ahmad Almansoor for helping me and educating me about Arduino building, Arduino coding, Autodesk Fusion 360 designing, and 3D printing, your hard work helped me make my vision a reality. I would like to thank the innovation team for their suggestions and really helpful criticism which made me better at writing reports.