Team 11 Robo-Weeder

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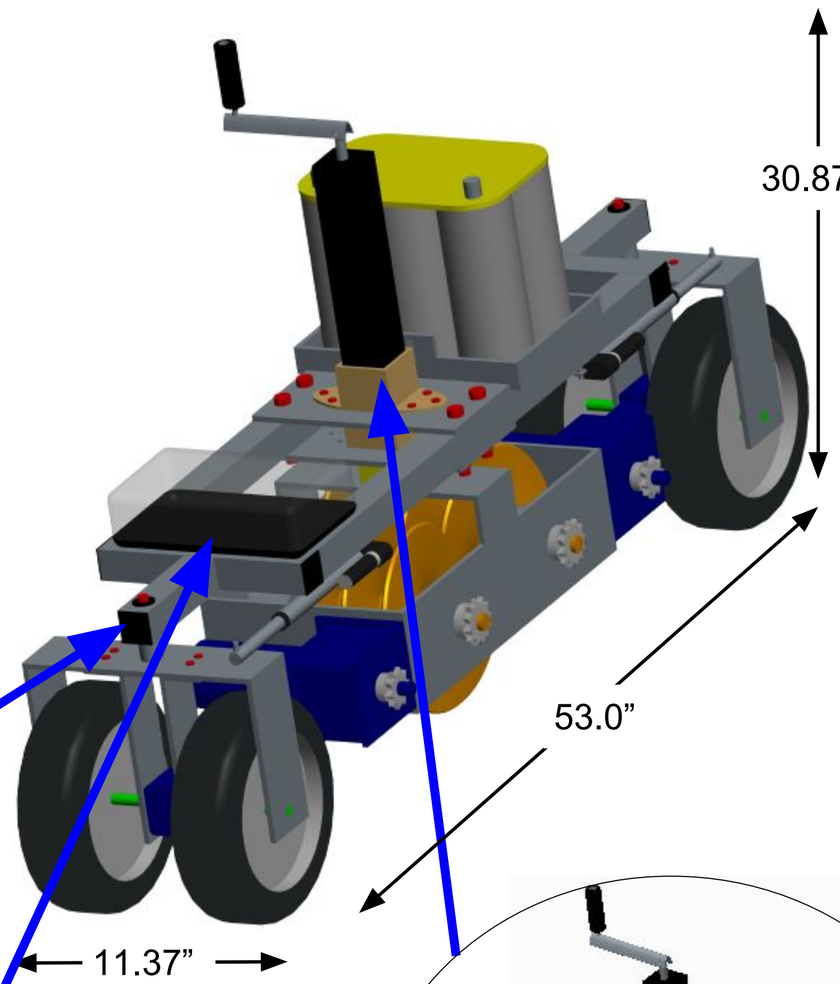
"Organic farming techniques rely heavily on labor intensive methods, that creates large production costs."

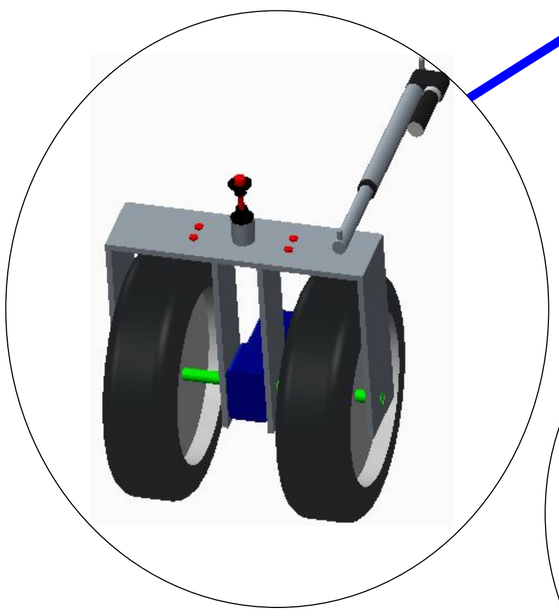
Purpose:

The purpose of the Robo-Weeder Senior Design project is to design a robotic system that will remove unwanted weeds through the application of a shearing force in order to facilitate the growth of high nutritional organic crops.

Design Features:

- Remotely Operated
- All Electric (12V Battery System)
- Splashproof
- Interchangeable Shearing Component
- All-Wheel Drive



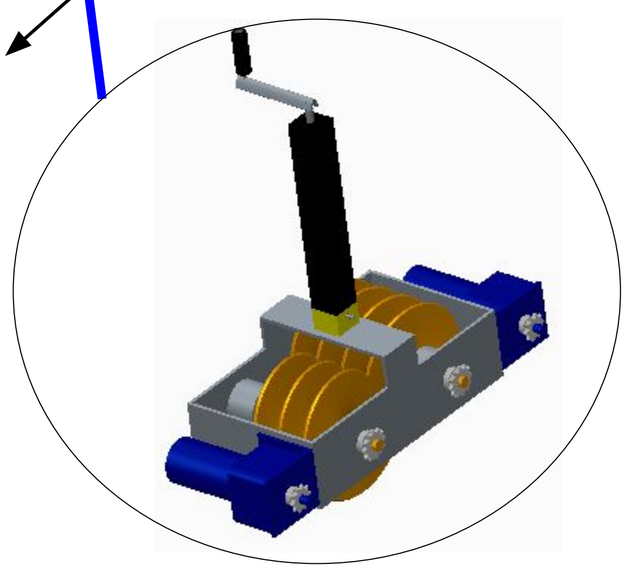


Steering Component:

- Front and Rear steering
- 30 degree rotation
- Independent Steering
  - Parallel Steering Capabilities

Electrical Housing:

- Splashproof:
- Microcontroller
- Receiver
- Motor Controllers



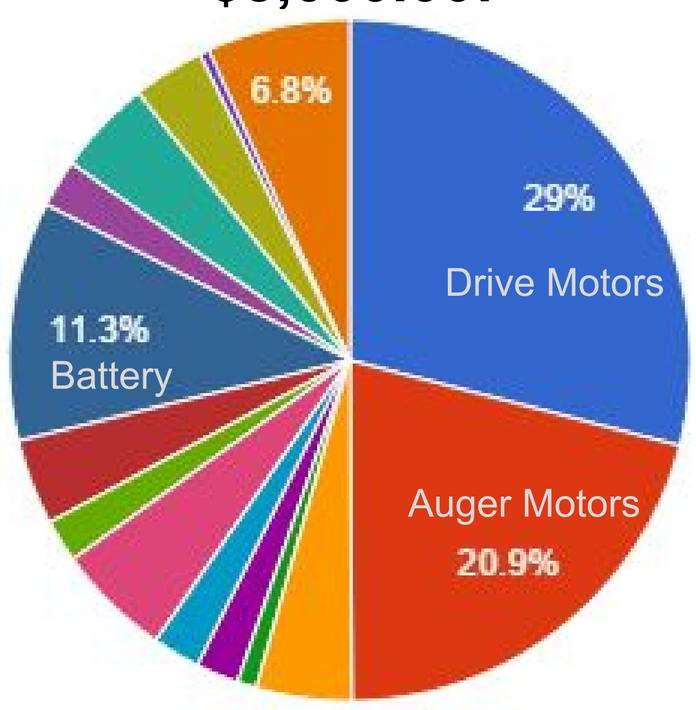
Shearing Component:

- Two Helical Augers
- Opposing Auger Rotation
  - Stability Purposes
- Vertical Adjustment

Objectives:

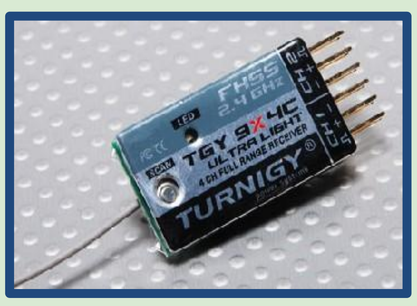
The primary objective is to design and create a proof of concept system, with varying cutting attachments that will remove weeds from the rows of planted crops and facilitate organic farming.

Projected Budget $3,000.00:

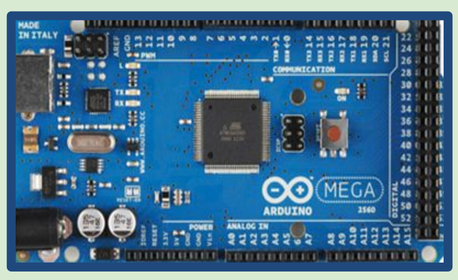


Electrical Components:

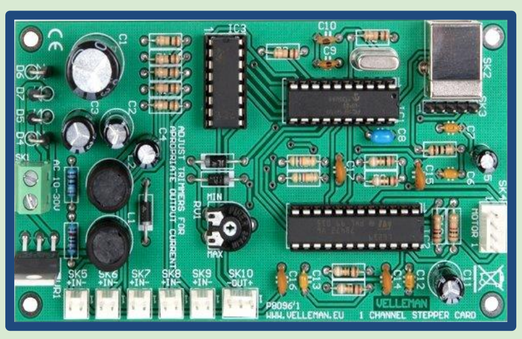
Turnigy 6X Transmitter



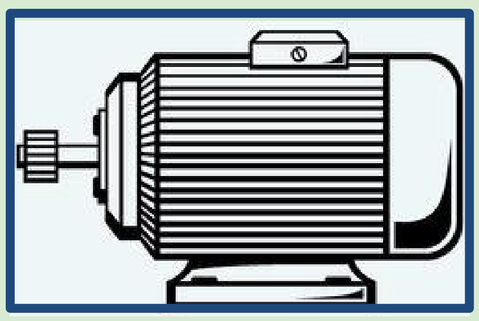
Turnigy XR700 Receiver



Arduino Mega 2560 R3 Microcontroller

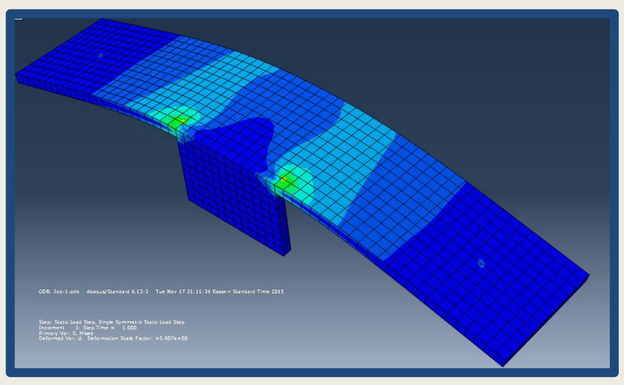


Motorcontroller

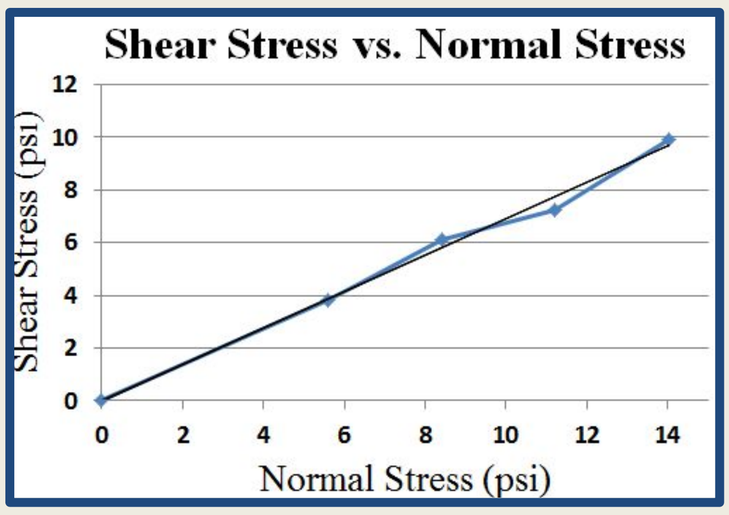


DC Motors

Initial Testing



Preliminary FEA stress study of conceptual chassis design



The Shear Stress vs. Normal Stress graph determines exact amount of force to facilitate the proper amount of soil shear.

Current Status:

- Optimal Auger Selection
- Fabrication of Chassis
- Programming Microcontroller
- Battery Selection

Future Goals:

- Motor Controller Selection
- Linear Actuator Selection
- FMEA - Failure Mode and Effect Analysis
- Prototyping

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