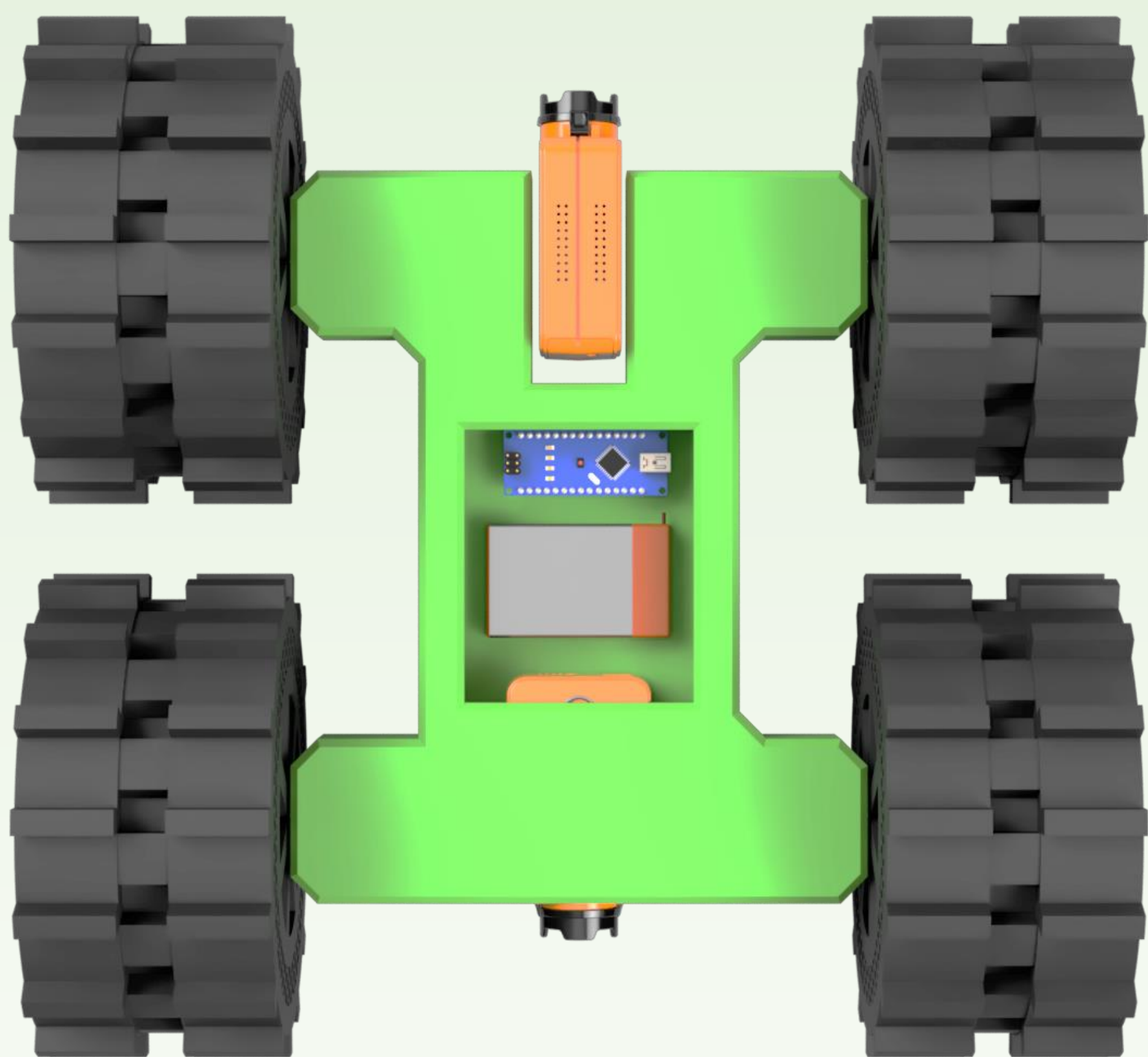


Uplink Robotics Drain Drone



Project Description

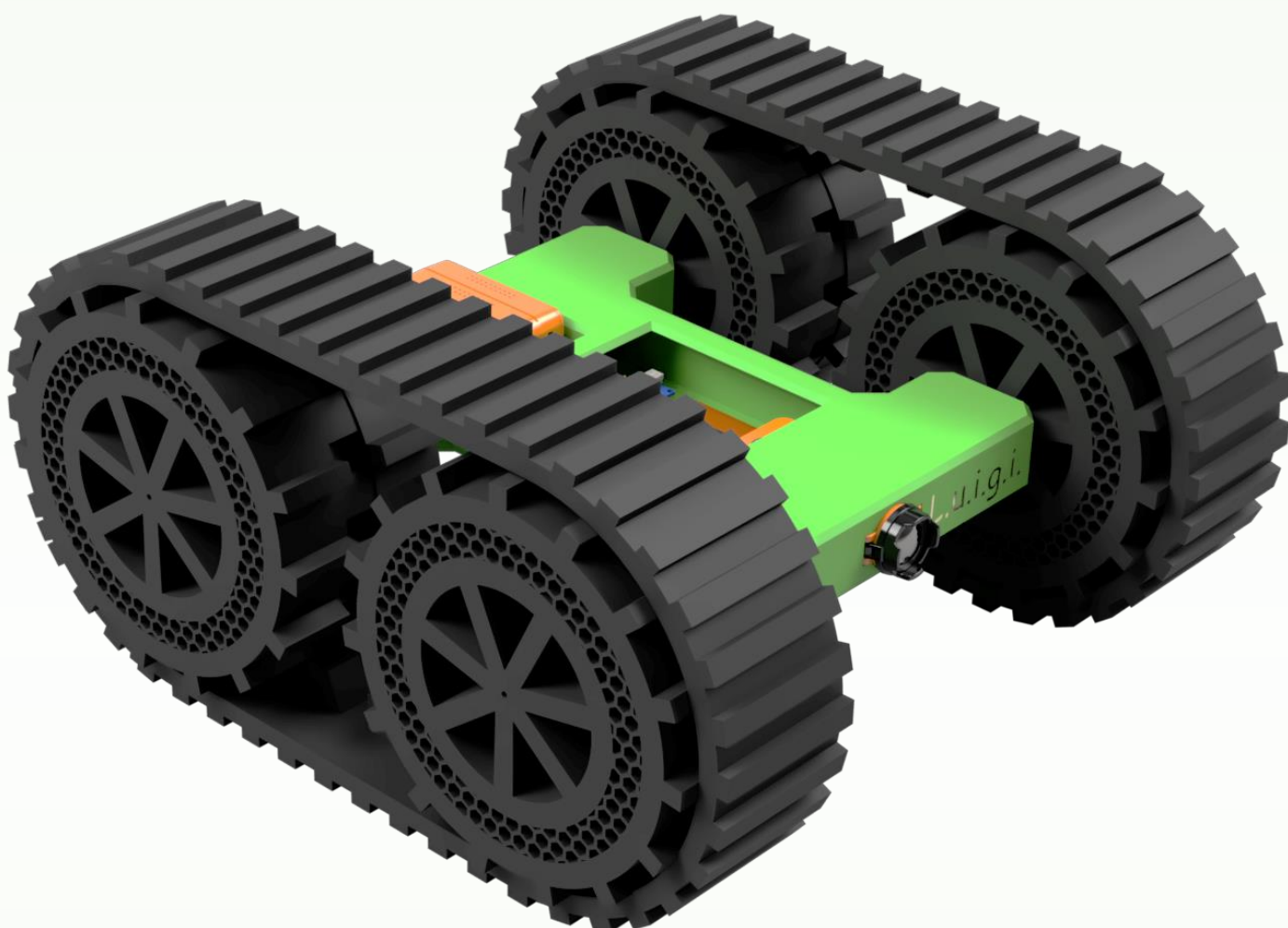
The purpose of this project is to create a remote-controlled drone capable of transmitting video back to a user to inspect pipes and other hard to reach locations. The idea is to maximize drone capability while also keeping cost low, unlike other potential solutions.

Design Requirements

- The project aims to design a robot that meets the following requirements:
- Compact design to fit in a 10-inch diameter pipe
 - Interchangeable tread and wheel drive system
 - Maximum speed under 5 mph for insurance compliance
 - Repairable in under an hour for terrain, battery, and chassis in the field
 - Can overcome a 3-inch diameter pipe obstacle
 - Water and dust resistant, withstands hose spray and 1.5-inch puddle

Initial Design

The initial design incorporates an adaptable tire and track system allowing the user to be able to easily change between tires and tracks for the task at hand. Attached to the frame is a front adjustable camera and a rear stationary camera for surveillance. LED lights will be added at a later date for illumination in dark spaces.

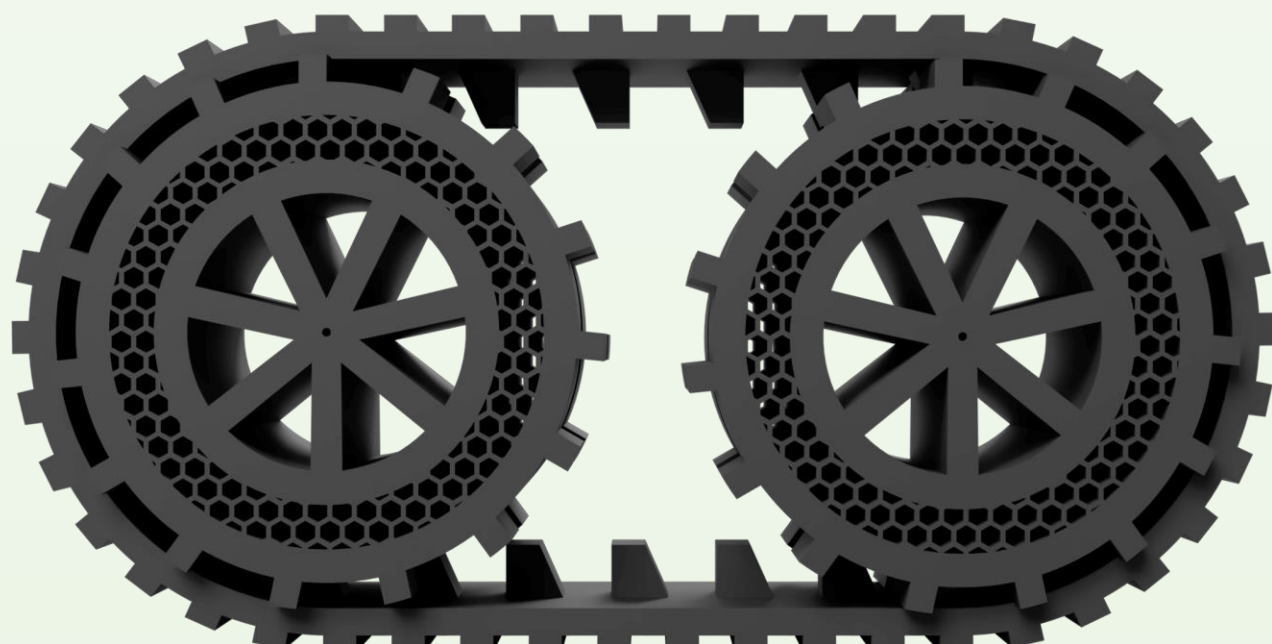
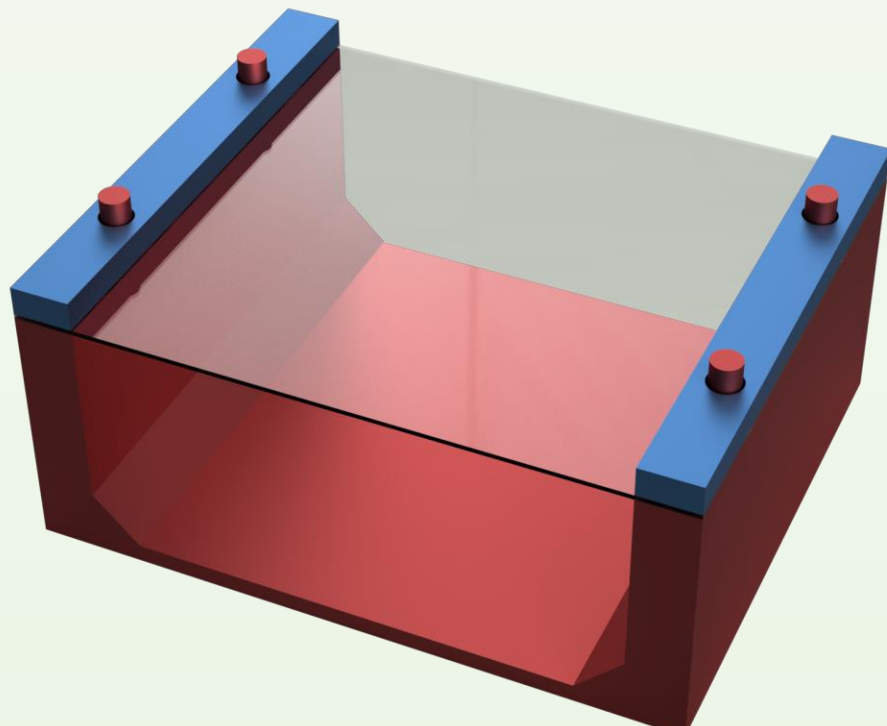
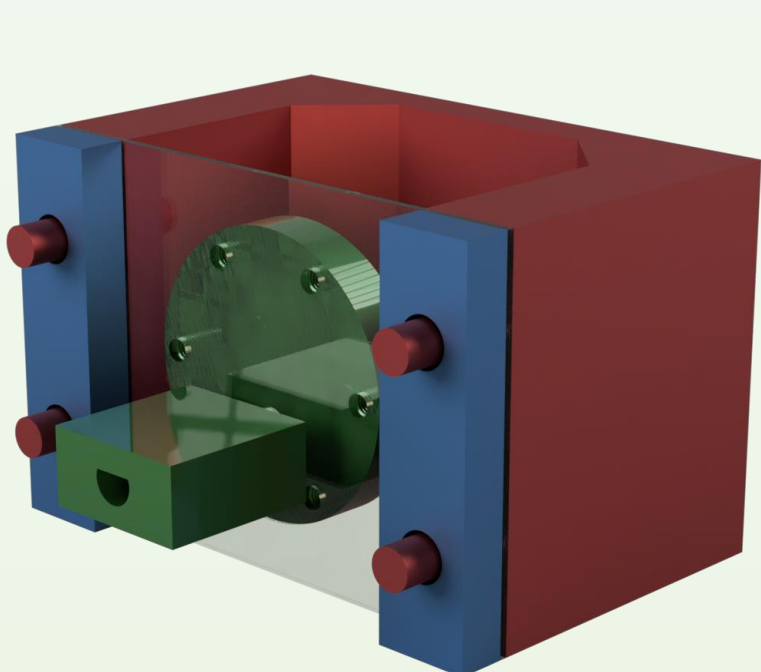


Design Process

- The design process we have applied are as follows:
- Create a list of requirements discussed with Uplink regarding robot capability
 - Create an initial CAD model based on initial requirements
 - Work with electrical team to finalize potential features and start the electrical design process.
 - Begin material testing to find a base 3D printed material that best meets our requirements
 - Start testing and designing various water proofing mechanisms

Going Forward

- The next step in the development of this project is to select the materials that will be used for the chassis and wheels. The current candidates for materials are TPU, PETG, Nylon, and HIPS. These materials will be tested by printing testing widgets that check the material's water resistance and mechanical properties. Below are two of the designed testing platforms and sample pieces.
- In addition to testing materials, a custom housing for the robot's controller will be designed and 3D printed.
- The largest hurdle in development is the design of the wheel and track system. Testing of the materials for the wheels is the first step followed by designing a belt that will be placed over the wheels with the correct amount of tension.



Client: Uplink Robotics
Authors: Alec Bledsoe, Alexander Manderfeld, Anthony Petsche, Dillon Weiss, Cody Zayonc

