

AEROS

AIRBORNE ENVIRONMENTAL RECONNAISSANCE OPERATIONS SYSTEM

Engagement and Need Identification

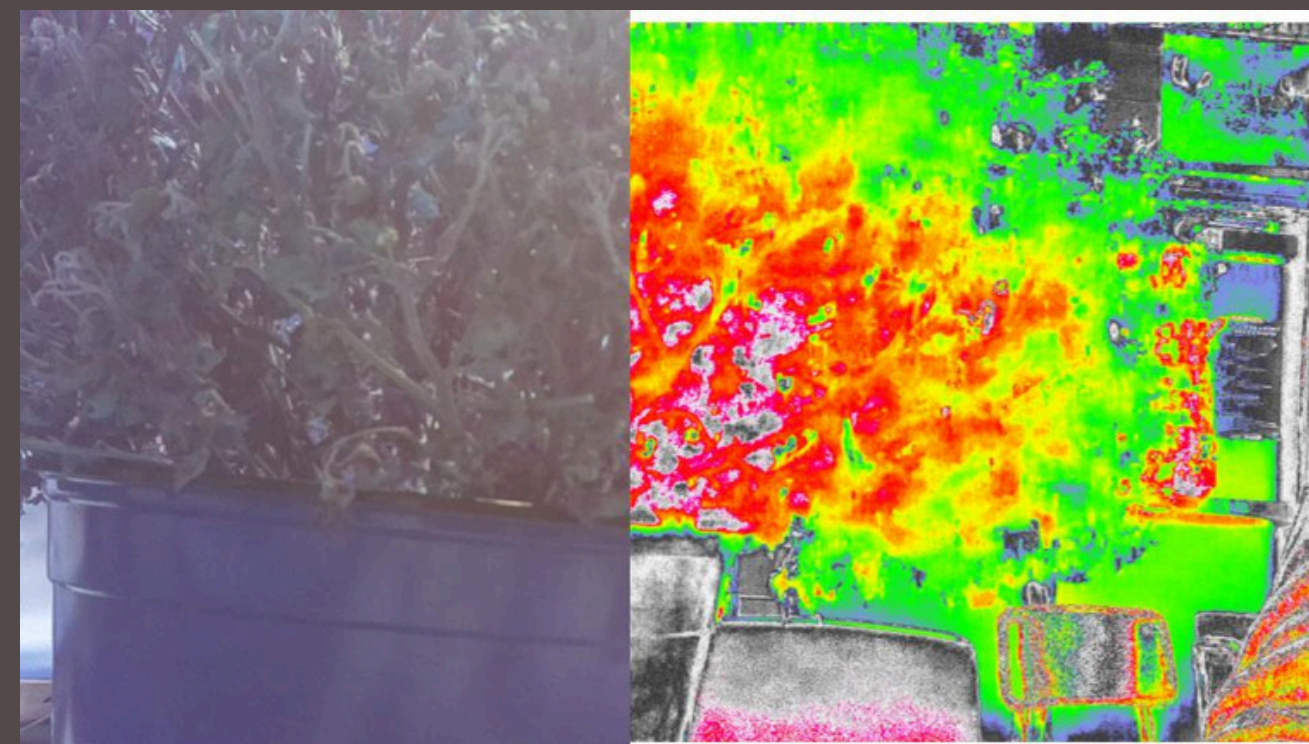
Our team began by identifying critical needs across various fields, including healthcare (telemedicine), environmental issues (water runoff), clean energy (solar-powered charging stations for public areas), school needs (a hallway cleaning bot), and agriculture (a drone to assess plant health).

After brainstorming, we narrowed our focus to four ideas: the plant health assessment drone, solar charging station, telemedicine solution, and hallway cleaning bot. Using a majority vote, we selected the plant health assessment drone as our final project due to its potential to address several agricultural challenges. These included supporting an aging farming population, helping farmers prioritize their time, and reducing the need for excess chemical dispersal by identifying specific areas that require treatment.

Our team worked collaboratively in defined roles, including researchers, coders, a technical writer, a drone pilot, and a treasurer, to bring our idea to life.



**Jacob test piloting
prototype drone**



**First Rendering of drone camera
identifying living matter**

Our Engineering Design Process

Our team faced the challenge of developing a camera that could identify living matter from non-living matter and attach it to a drone. The drone would then need to withstand the camera's weight and be remotely piloted.

After conducting detailed research on potential drone designs, we successfully purchased and assembled our prototype drone and completed several tests to determine its maximum height, range, and carrying capacity.

Once finished booting, the Raspberry Pi checks if the switch is on. If it is, it captures an NDVI image and a PTH reading with 5 seconds between each capture 10 times and saves them. This repeats until the switch is off. Images that are captured are first translated into a grayscale image with the NDVI formula using the blue and red channels and then converted into a color scale.

Local Business and Industry Partnerships

Our team partnered with Christopher Ghigliotti, an engineer at Letterkenny Army Depot. He provided weekly guidance, offering advice on our project, organizing industry tours relevant to our work, helping us maintain a realistic scope within the timeline, and assisting in selecting appropriate technologies for our application.

Additional Resources

Scan To Access



**Video
Presentation**



**Budget
Documents**



**Presentation
Document**

Resources

- <https://lavocedinewyork.com/en/new-york/2023/08/28/nypd-to-deploy-drones-at-crime-scenes-for-quicker-response/>
- <https://www.buffalo.edu/access/help-and-support/topic3/universaldesignprinciples.html>
- <https://www.teachengineering.org/populartopics/designprocess>



**Noah and Michael working on the
code for the prototype drone
camera**