AgroDrone Patrol

Autonomous Crop Patrol System

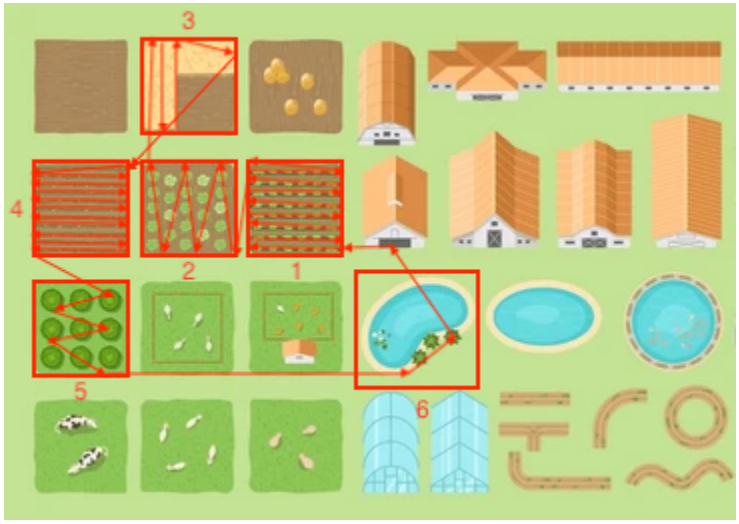
Leon Li and Larry Zhong

May 29 2025

Table of Contents

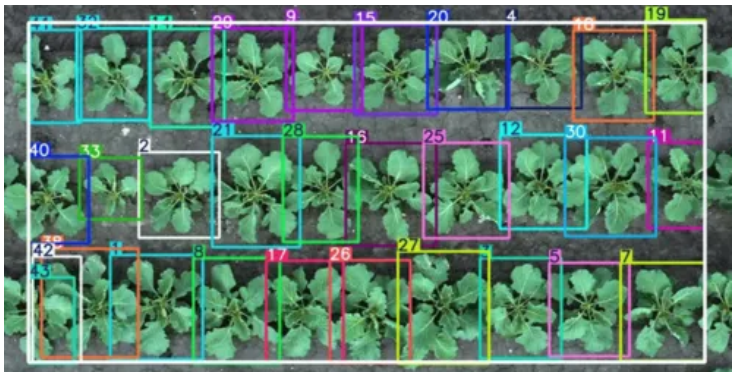
Roles:

Leon - PathFinder Pro
Navigating - Where for the drone to stay, where for the drone to go, shortest safest path
Example:



Example Online Found:
https://thenewstack.io/drones-fly-drive-using-path-planning-algorithms/

Larry - PlantVitality Monitor
Crop Detection - Detect Status of Crops (Healthiness, Type of Sickness/Predict Reason, Predict Harvestable Time, if need to add water, renovate soil, or add fertilizer)



Example:
https://www.ultralytics.com/zh/blog/real-time-crop-health-monitoring-with-ultralytics-yolo11

Goals

(Further Development will be Whole Farm System)
https://github.com/Larryzpl123/ADP

SMART Goal

Specific	Detailed Goal Description	
Measurable	Able to Measure Progress	
Achievable	Possible	
Relevant	Related Resources	
Time	Time needed	

Plan and Process Journal

Date/Day	Part	Specific Task
5/28 - 10	Initial Create, Plan, Basic Research	● Create Working Folders and Files ● Start Writing Plans ● Start Finding Good Example Projects to Learn From Github, Bilibili, and Youtube ● Learn More About Useful Libraries like OpenCv and Yolo
5/29 - 11	More planning, set goal	●
5/30 - 12		●
6/02 - 13		●

Appendix

Documents

Stage 1 Document

Stage 2 Document

Name: Larry & Leon

Capstone Project Proposal – take 2!

This proposal is to be written individually and will help us guide you into groups or cohorts with similar interests. Please answer each section thoughtfully and completely. Your final project will grow from this foundation.

1. What Would You Like to Do?

Describe your idea for your Capstone Project. What problem or topic do you want to explore or solve?

ADP – Agro Drone Patrol – Autonomous Crop Patrol System
(will further develop to Farm system)
Leon – Path finder Pro, navigate drone to right place quick & safe
Larry – PlanVitality Monitor, detect status of crops

2. How Does This Connect to the Course Goals?

Explain how your idea ties into the big ideas of this course; such as drone technology, autonomous systems, programming, engineering design, problem-solving, community connection, etc.

This ties to drone tech, auto system, programming, problem solving and community connection because: – use drone – auto patrol sys
– programme with mainly python (machine learning & CV (tran control))
– solve problem of (slow and inaccurate of human checking)
– connect to farmers as community connection
programmer & engineers ↑ interesting pair

3. How Do You Think You'll Present It?

What will your final product look like? Will it be a live drone demonstration, a video documentary, a physical construction or design, a PowerPoint, a photo gallery, or something else?

mainly → video along with a short live demo and short show & present
demo and explain (present)

Name: Lamy & Leon

4. What Will You Need to Complete Your Project?

A. People – How many people will be working on this project? What role will each person play?

A drone with video cable camera, best with radar
fly stably for 20 min +
2 computer (or powerful computing board) to run two ai parts, tracking and detecting. Best with access to real farm (with google colab/amazon cloud service)
But also work well with video simulation.

B. Resources – What kinds of drones or materials will you need? Do you need any special equipment, programs, or access to locations? Please list and be specific.

Leon – Trucking system programmer & power system engineer
Lamy – Image recognition (crop detection) programmer, image processing engineer

Once completed, submit this proposal to your instructor. Your responses will be used to form project groups with others who share similar interests or project goals.

Visualized Project Structure

```
Example_Project/
├── src/                # Source files
│   ├── main.py         # Main application file
│   ├── module1.py      # Module 1
│   ├── module2.py      # Module 2
│   └── utils.py        # Utility functions
├── tests/              # Test files
│   ├── test_module1.py   # Tests for Module 1
│   ├── test_module2.py   # Tests for Module 2
│   └── test_utils.py     # Tests for utilities
├── requirements.txt      # List of dependencies
├── README.md             # Project documentation
└── .gitignore            # Files to ignore in Git
```

Codes

Pathfinder Pro Code

b

PlantVitality Monitor

c