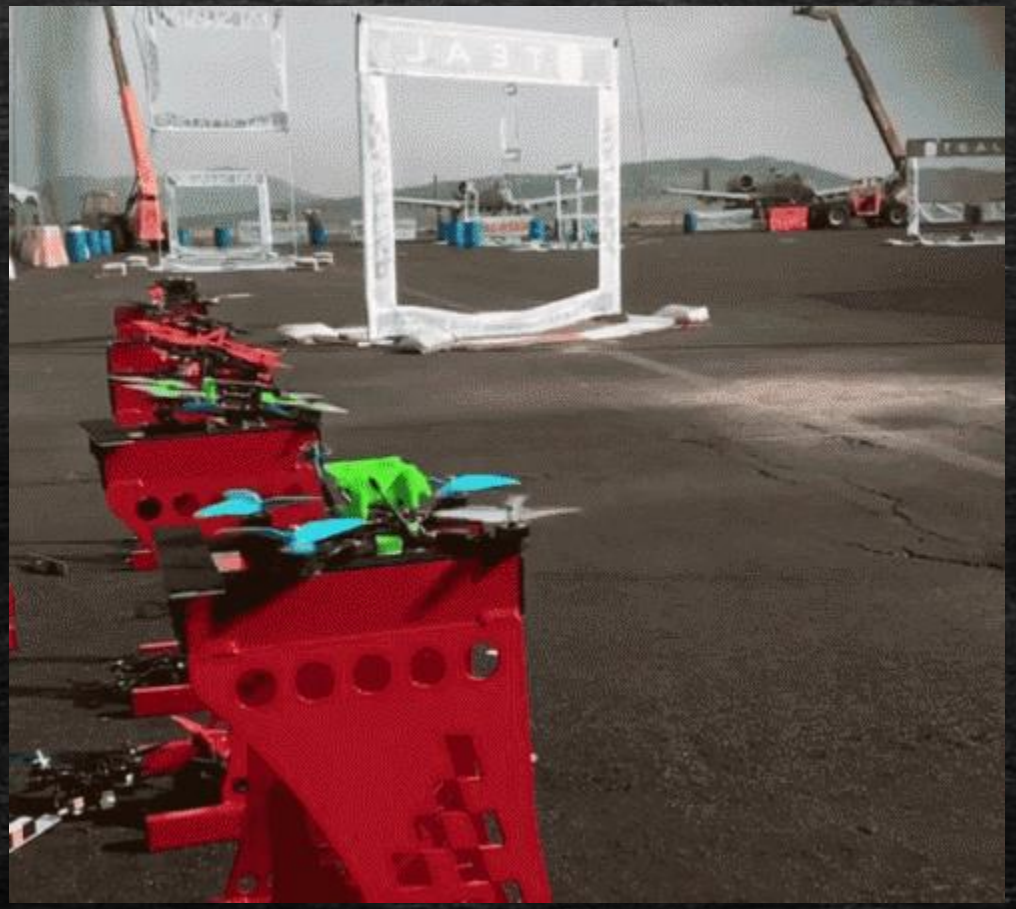
Pandora's Box

Project 3 by Chris Duran

What have I been up to the last month?

Well, the baby version anyways

Drone Swarms!



What do you mean?

So What is a Drone Swarm?

A drone swarm, or its proper name, is an AI-Driven Multi-Drone Control System

This consists of a group of drones working together to complete a task or multiple tasks

They operate autonomously based on local interactions and simple rules

What are the benefits?

Scalability: Easily increase the number of drones for larger tasks

Flexibility: Adapt to different missions and environments

Redundancy: Robust to individual drone failures

Efficiency: Perform tasks faster by working in parallel

But what do they do?

- Search and Rescue: Efficiently covering large areas
- Agricultural Monitoring: Surveying and analyzing crop health
- Entertainment: Creating dynamic light shows and performances
- Infrastructure Inspection: Inspecting bridges, pipelines, and other structures

And of course, the good ole Military Industrial Complex

How do I test them?

Microsoft AirSim

- An open-source simulator for drones, cars, and more
- Built on Unreal Engine for high-fidelity simulations
- Supports APIs for Python, C++, and more
- Chosen for its realistic physics engine and extensive API support

Unreal Engine 5

Challenges in Controlling Multiple Drones

Synchronization of drone movements

Avoiding collisions

Ensuring reliable communication

Managing computational resources

Technical Fun Stuff

Primary Libraries I am using is
DroneKit
OpenCV
Numpy

Primary Communication link I am using is MAVLink, a protocol for communicating with small unmanned vehicles

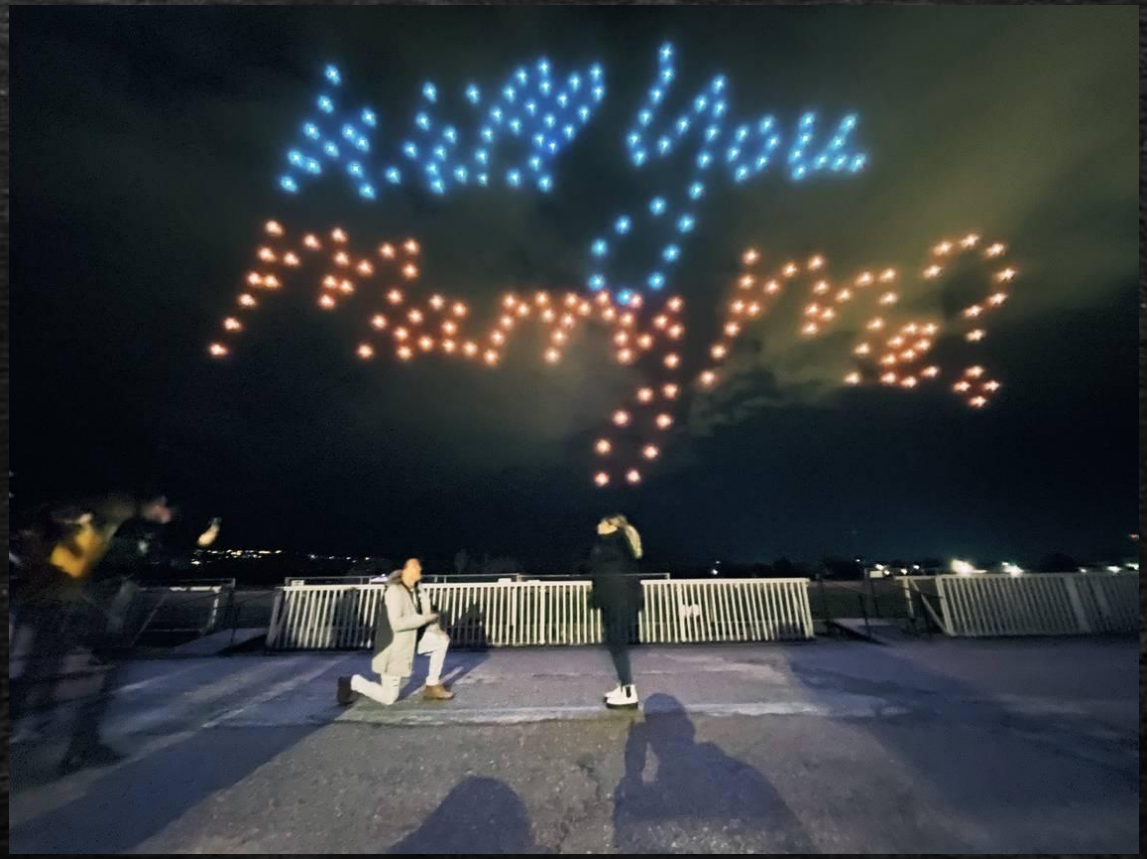
Primary Simulation software is Microsoft AirSim

What am I going to do with it?

Girlfriend of 5 years got me into AI and helped me with the connections for the job now.

This is going to be a fitting way to show it

Ps picture not actually me but project code is the code I am making for the proposal itself



Thank you for listening and congrats on all the work you have done and will achieve!

Thank you again to Sean and Firas, and each and every member of the class

I now open the floor for questions