

# Reflection & Justification Document

## My Understanding of the Project Topic

I understood this project as building a decision-making tool that checks if a planned drone flight path is safe to execute in shared airspace. The system should detect conflicts by comparing the primary mission to other drones' missions in terms of both space (distance) and time (overlap).

## My Approach and Thinking for the Solution

My approach was to keep the solution clear and lightweight, focusing on core functionality rather than overcomplicating it with heavy tools or simulations. I split the work into smaller modules: spatial checks, temporal checks, and visualization, so each part could be tested independently. For visualization, I chose matplotlib because it is simple, widely supported, and does not require large external dependencies. This choice keeps the solution easy to run and modify for different scenarios.

## Ongoing Self Project

Alongside this project, I am currently working on my own autonomous drone simulation using PX4 and ROS. That project is more complex and still in progress. The experience I have from that work helped me design this deconfliction system with realistic constraints in mind.

## Use of AI Tools

I used AI (ChatGPT) as a support tool for two specific purposes: 1) Getting a roadmap at the start to ensure I didn't miss any key features mentioned in the problem statement. 2) Looking up Python syntax and function usage when I needed quick references. All final implementation, logic, and testing were done by me. I wrote the code in my own style, adjusted the structure, and verified each part manually.

## Conclusion

This project helped me apply structured problem-solving, modular coding practices, and clear visualization to a real-world UAV safety challenge. I ensured that the system meets the requirements while staying simple enough to understand, extend, and integrate with other systems in the future.