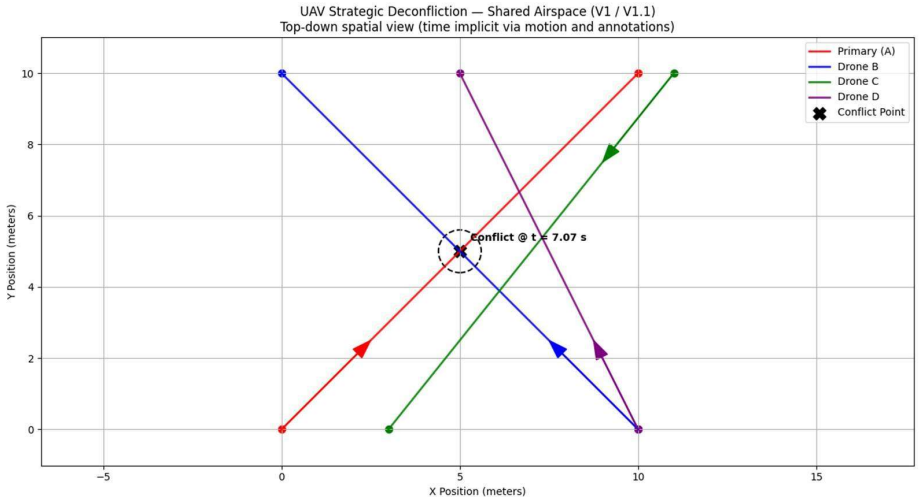
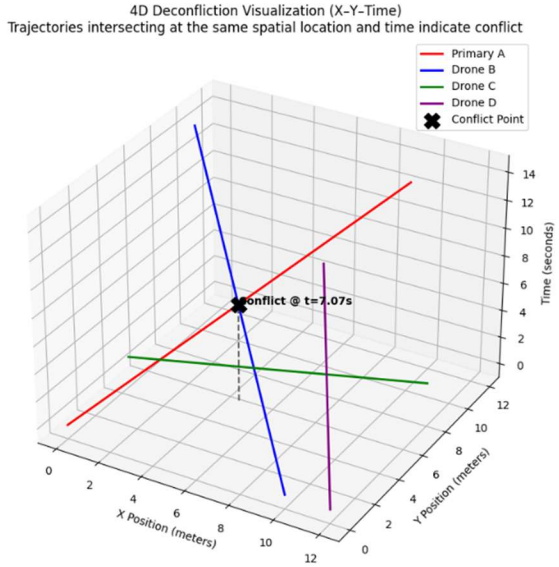
# Custom Test Case Result



 Scenario1:

This test case demonstrates a conflict scenario involving four drones (A, B, C, D) operating in the same shared airspace.

- All drones follow piecewise linear waypoint paths
- Each drone travels at a constant velocity
- A minimum safety separation of 1.5 meters is enforced
- The primary drone (A) is evaluated against all other drones

The visualization shows a top-down spatial view of the airspace:

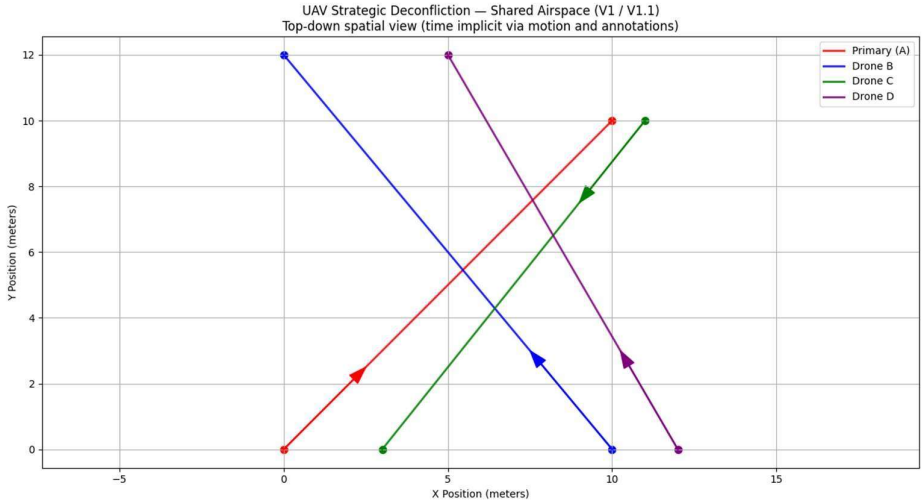
- X-axis and Y-axis represent spatial position in meters
- Arrows indicate direction of motion
- Time is implicit, encoded through motion and conflict annotation

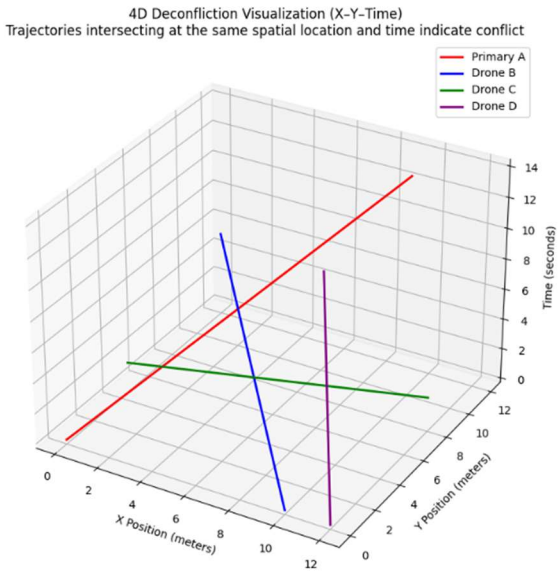
 Observations from the Visualization

- The primary drone A (red) and Drone B (blue) follow trajectories that intersect.
- Both drones reach the intersection point at the same time, resulting in:
  - identical spatial position
  - zero separation distance
- The conflict point is clearly marked with a black X and a dashed safety boundary.
- Drones C (green) and D (purple) share the same airspace but remain safely separated throughout the mission.

This confirms that the conflict arises due to spatial and temporal overlap, not merely path intersection.

 Scenario2:


UAV Strategic Deconfliction — Shared Airspace (V1 / V1.1)
Top-down spatial view (time implicit via motion and annotations)
Primary (A)
Drone B
Drone C
Drone D
Y Position (meters)
X Position (meters)


4D Deconfliction Visualization (X–Y–Time)
Trajectories intersecting at the same spatial location and time indicate conflict
Primary A
Drone B
Drone C
Drone D
X Position (meters)
Y Position (meters)
Time (seconds)

This result corresponds to the custom test case involving four drones (A, B, C, D) operating simultaneously within the same shared airspace.

- All drones follow piecewise linear waypoint paths
- Each drone moves at a constant (but drone-specific) velocity
- All missions are evaluated within a common mission window
- A minimum safety separation threshold of 1.5 meters is enforced

The visualization presents a top-down spatial view of the airspace:

- X-axis and Y-axis represent spatial position in meters
- Arrows indicate direction of motion (velocity direction)
- Time is implicit, encoded via motion along trajectories

- Observations from the Visualization

- All four drones share overlapping regions of airspace.
- Drone trajectories intersect spatially but do not violate minimum separation at the same time.
- No pair of drones comes within the defined safety threshold during overlapping time intervals.
- Each drone maintains safe separation throughout its mission.

This confirms that spatial intersection alone is insufficient for conflict; temporal alignment is equally critical, as required by the assignment.