

Preamble:

We present six different simulations of a combat encounter. The rules are a simple form of hide-and-seek. In the simulations, the drone – the aerial Member – and the man wearing the green t-shirt – the ground member – form a team. They work together to target their opponent, who wears a red t-shirt.

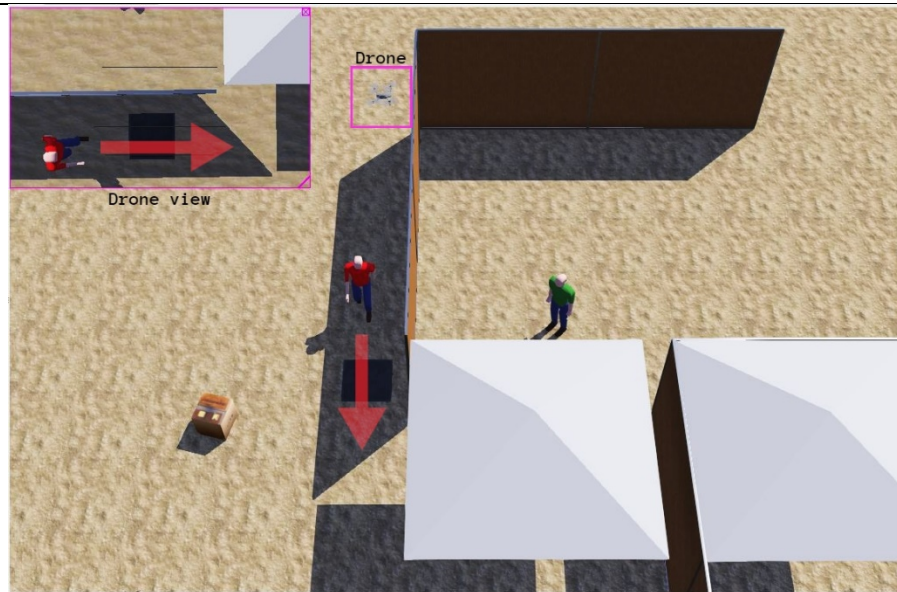
Each of the six scenarios is illustrated below, with each showing the initial and final situation for that scenario. The final situation shows the environment state after the drone makes its decision. It chooses from three options: to stay, to move, or to give advice to the ground team member.

The illustrations also show the drone camera view (with pink boxes for the drone and the drone view) and a prediction of the behaviour of the ground team member and of the opponent (red arrows show the predicted movement).

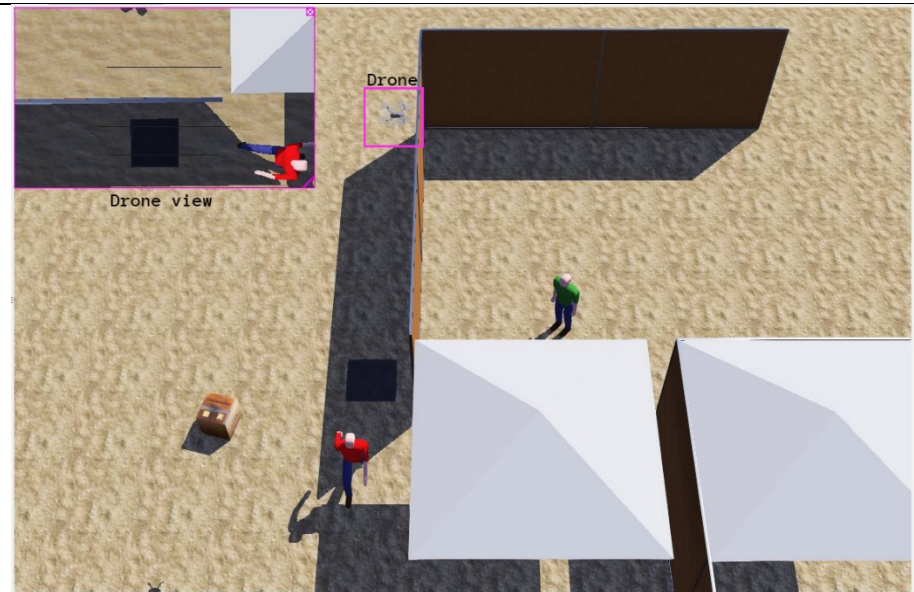
The drone bases its decision on its view of what the ground team member and the opponent are doing.

Scenario 1: Ground team member does not move from their position.

Initial situation



Final situation

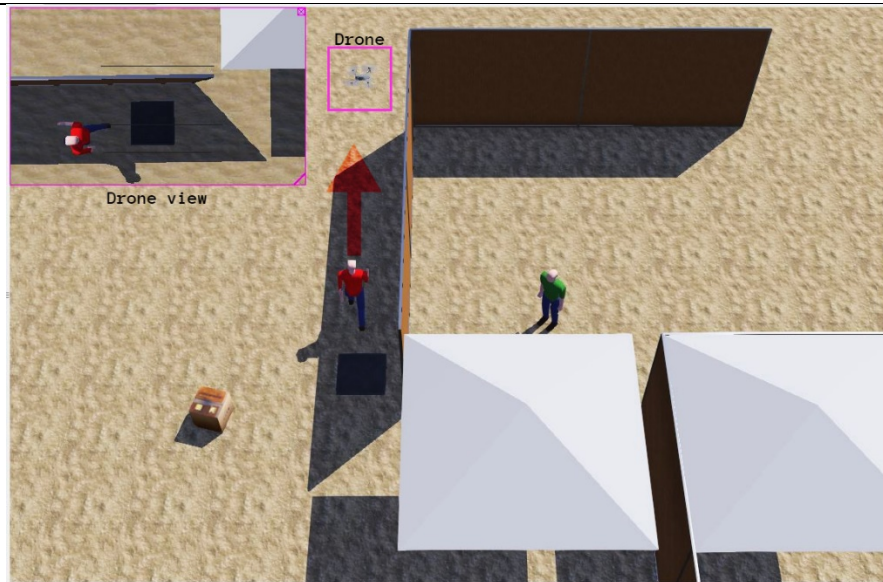


Question for the drone: Why did you recommend that the ground team member not move?

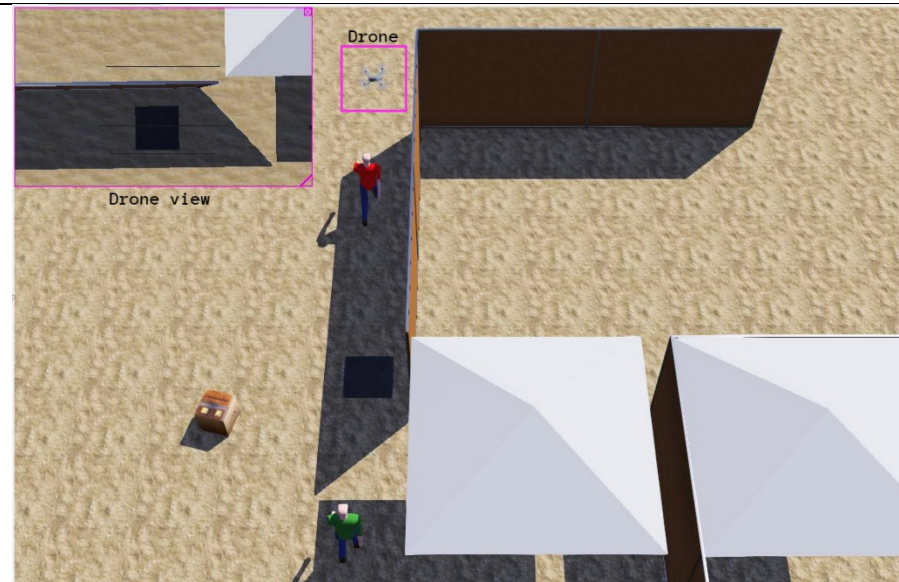
Explanation: Because, given my prediction of the opponent's behaviour and the ground team member's current position, it is more probable that the opponent will be hit from the ground team member's present position.

Scenario 2: Ground team member moves towards opponent.

Initial situation



Final situation

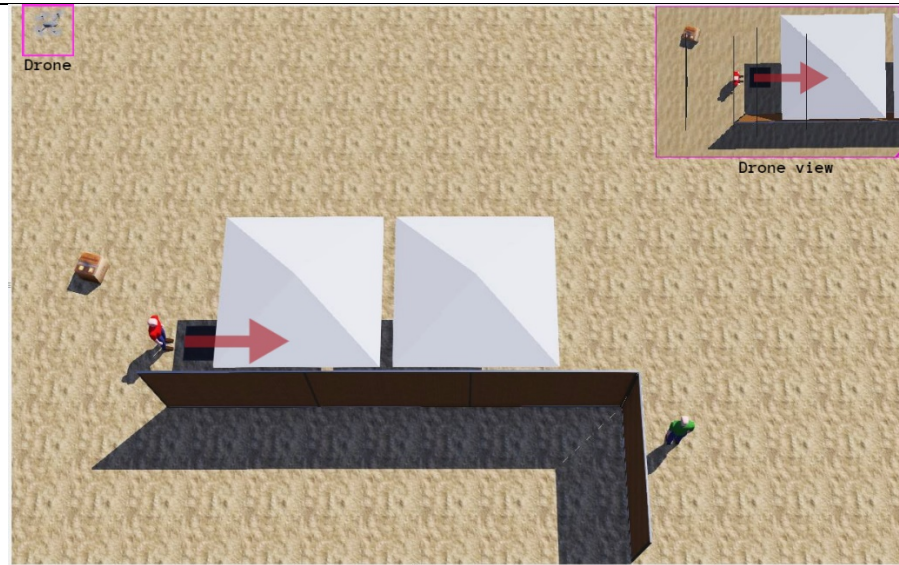


Question for the drone: Why did you advise the ground team member to move towards the wall?

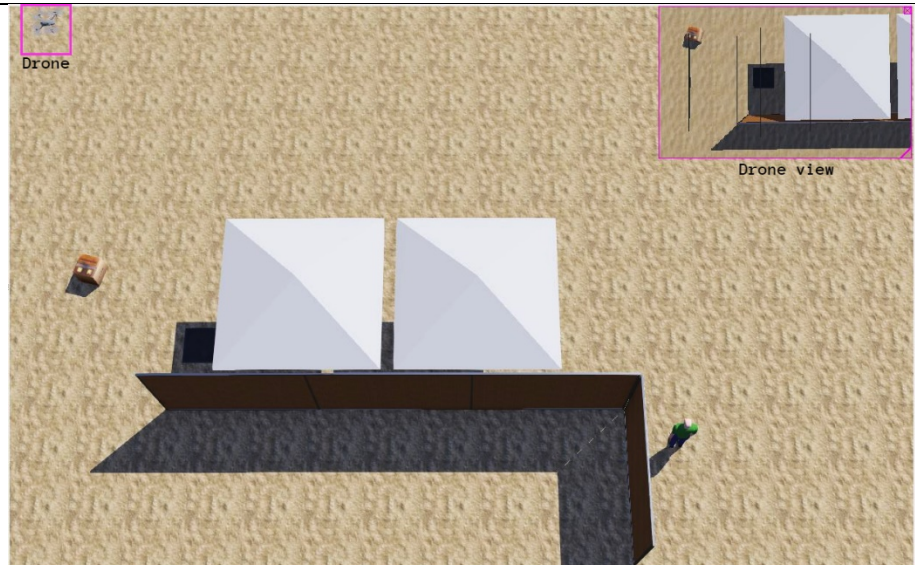
Explanation: Because, given my prediction of the opponent's behaviour, it is more probable that he will be hit when he is running next to the wall.

Scenario 3: Opponent hidden under the gazebos.

Initial situation



Final situation

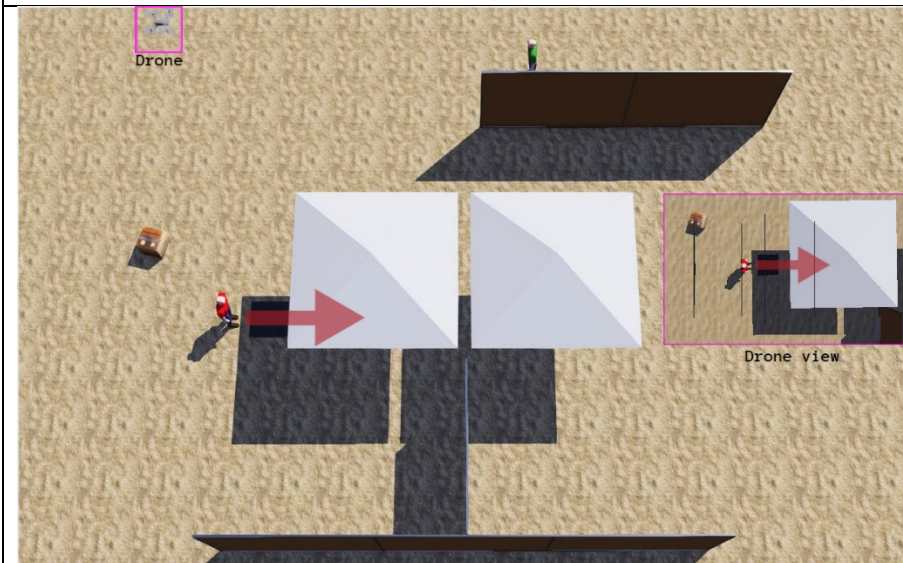


Question (for the drone): Why did you remain where you were?

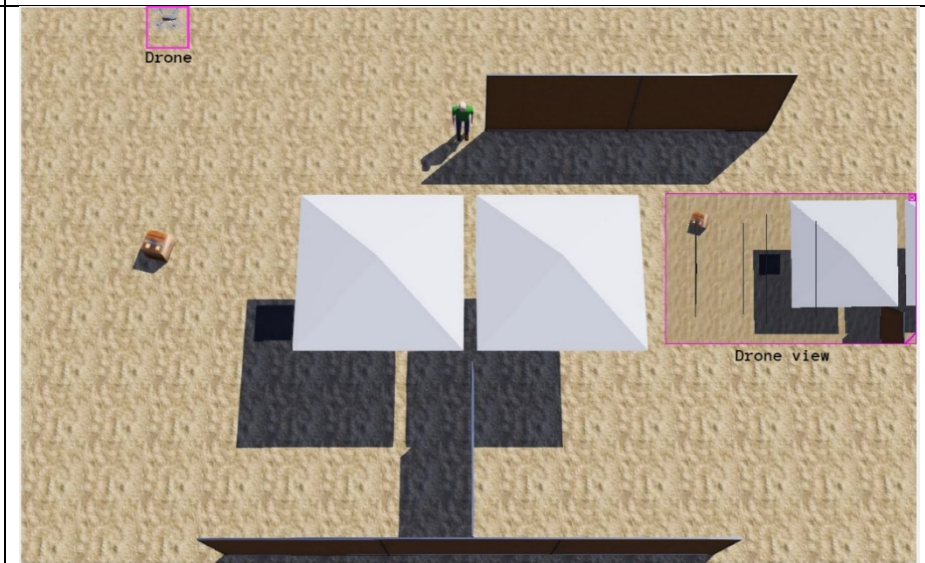
Explanation: Because the ground team member would have a higher probability of hitting the opponent exiting from the gazebo. If the opponent exits to the right, there is a ground team member there to hit him. If the opponent exits to the left, I can hit him myself.

Scenario 4: Opponent hidden under gazebos with unclear next behaviour.

Initial situation



Final situation

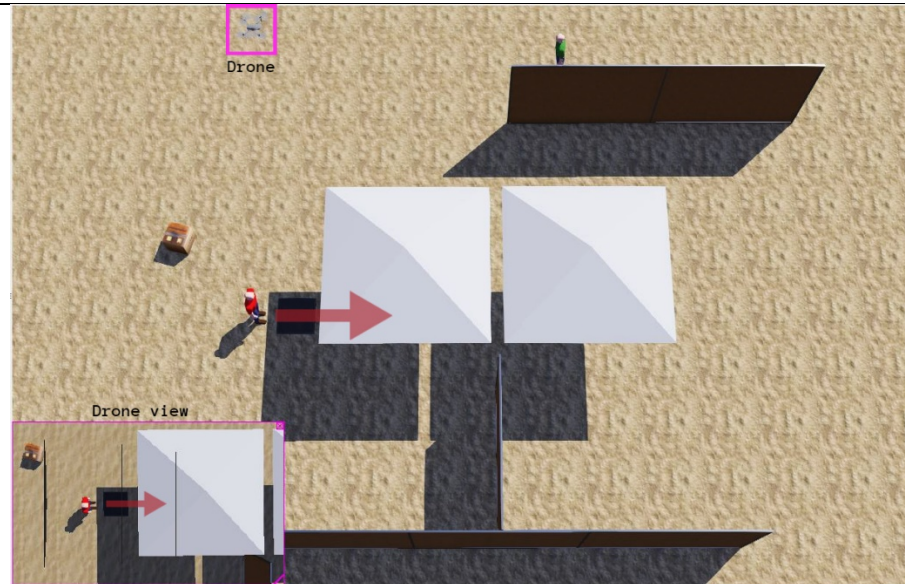


Question (for the drone): Why did you stay in the same position?

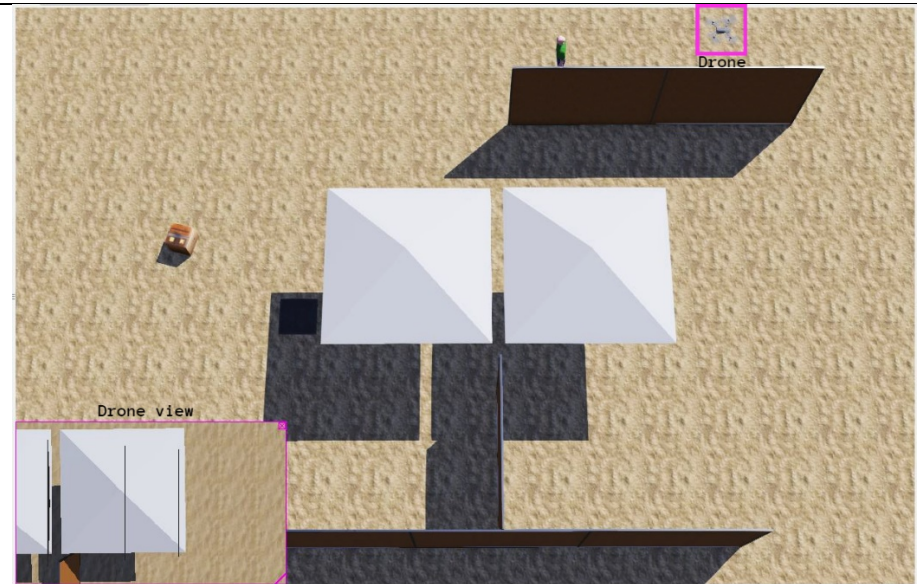
Explanation: I stayed in the same position because, based on previous ground team member's behaviour, I predict the teammate will move from the other side of the wall to target the opponent.

Scenario 5: Drone moves actively looking for opponents.

Initial situation



Final situation



Question (for the drone): Why did you move to the right?

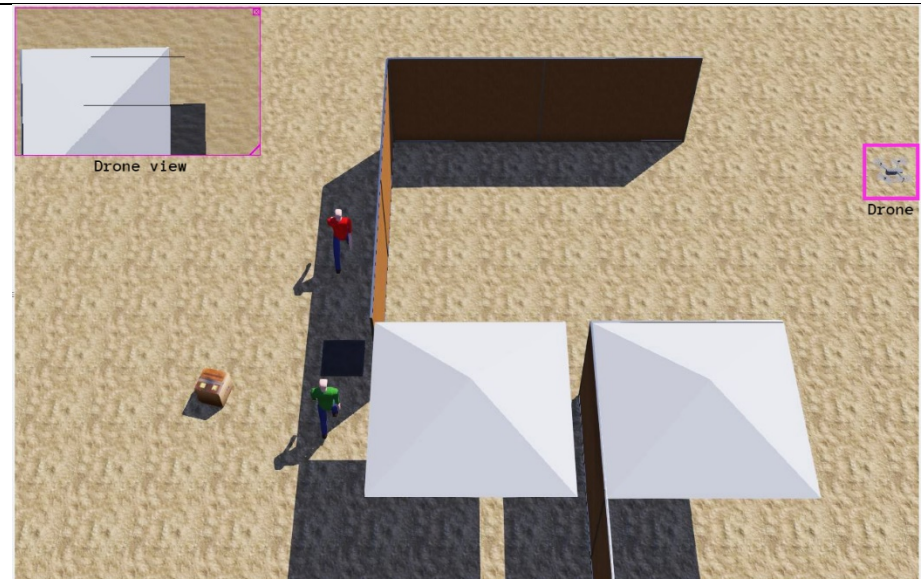
Explanation: I moved to the right of the gazebos because I predict the teammate will not move from their position and, based on the previous opponent's behaviour, I predict the opponent will exit from the gazebos to the right. Therefore, I have a higher probability to target the opponent from that position when exiting the gazebos.

Scenario 6: Drone moves actively looking for opponents after ground team member targeted an opponent.

Initial situation



Final situation



Question (for the drone): Why did you move beside the gazebo?

Explanation: I moved beside the right gazebo because in my previous position an opponent has been already targeted by a ground team member and, therefore, in the new position I have a higher probability to target another opponent who may be hidden under the gazebo.