

ABSTRACT

Unmanned Aerial Vehicles (UAVs) are one of the specialized techniques poised to enhance the disruptions that have revolutionized the aviation industry. One of these techniques is the Swarm Drone. Swarm Drone is an unmanned aerial vehicle technology that involves a group or a swarm of more than one drone capable of moving, communicating, and coordinating simultaneously. This technology mimics the principles of how groups of animal's form information and specific behavioural patterns. Swarm drones serve not only as aerial vehicles but also can shape specific formations or patterns for purposes.

Therefore, in this final project, a prototype of a swarm drone has been developed that can communicate between drones and executing movements according to user preferences. This prototype consists of two quadcopters, where one quadcopter acts as the drone leader and the other acts as the drone follower. To identify the communication system for flight among these drones, three control elements have been developed for implementation. These controls include dynamic flight, position tracking, Leader-Follower formation control, and data communication functions between the drones and the ground control station.

In this final project, the quadcopter comprises 2 drones with roles as leaders and 1 follower. The outcome of this final project is that the drone leader and follower can reach the desired goal, with an average ascending speed of 0.3292288 m/s and an average descending speed of 0.3886089 m/s. Furthermore, the average forward speed for coordinated drone movement to a point is 0.3032391 m/s, and the average backward speed for coordinated drone movement to a point is 0.3008058 m/s.

Keywords: drone swarm, communication system; UAV and quadcopter.