

Drones and Drone Swarms

- **Drones**, also known as unmanned aerial vehicles (UAVs), are aircraft that are operated without a human pilot onboard. They can be remotely controlled by a person on the ground or fly autonomously using pre-programmed flight paths or artificial intelligence algorithms.
- **Drone swarm** refers to a group of drones that operate together in a coordinated manner, often under the control of a centralized system or network. These swarms can consist of dozens, hundreds, or even thousands of drones, depending on the application and capabilities. Drone swarms can exhibit collective behavior, where individual drones communicate and collaborate with each other to achieve a common goal.



Applications

- **Surveillance and Reconnaissance:** Drones provide real-time aerial intelligence for monitoring borders, urban areas, and security situations. Drone swarms enhance surveillance by covering larger areas simultaneously.
- **Agriculture:** Drones monitor crop health, soil conditions, and irrigation needs efficiently. Swarms scale these capabilities for large-scale farming operations.
- **Search and Rescue:** Drones scan vast areas to locate missing persons or survivors in hazardous environments. Swarms cover expansive search areas rapidly, improving response times.
- **Military Operations:** Drones conduct reconnaissance, target acquisition, and precision strikes in military settings. Swarms overwhelm enemy defenses, disrupt communications, and conduct synchronized attacks.



Competition

- **The drone competition** involved the use of both drones and drone swarms, where each group had to code a single drone and a drone swarm to be able to identify obstacles in a maze, and translate signals back to the computer such that the maze could be mapped out. Furthermore, the drones were also required to identify special targets and locations to which additional points would be rewarded.
- **Our competition strategy** was to focus on coding the drone such that it would be able to complete and map out a large portion of the maze, in the shortest time possible. In the end, our strategy succeeded as we emerged as the only group which completed the maze, and gained plenty of points to secure our position in this competition.



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