

# Data Collection using a Drone Network

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April 15, 2023

## 1 Introduction

The main idea of the project is to implement a network with the purpose of collecting data autonomously from a wide geographical area by using drones in an ad-hoc network. This means that, at least in a theoretical sense, this network could end up being used in different scenarios such as:

- Patrolling forest areas to assist in fire prevention;
- Monitoring activity in a given geographical location;
- Surveillance

## 2 Specifications

Everything written below is theoretical in nature or, at the very least, an initial idea for implementation.

### 2.1 Data Collection

A first thing to consider for the implementation is its use. For this network, its usage will directly influence the data that it's intended to collect. For that, three questions can be posed that should allow to determine the more correct approach:

1. What data to collect?
2. How to collect said data?
3. How to process and use the collected data?

One last thing to consider when it comes to data collection is that, in this case, the altitude at which the drones will fly is also a factor to consider (at least for certain operating environments).

### 2.2 Data Usage

How the data is used depends on the use case but for this project, a goal would be to use statistical prediction of some sort but this would have to be thought of later in development.

### 2.3 Entities and Life cycle

The network would be comprised of two different types of entities: the drones and the central hub. The hub would function as both the docking station for the drones as well as the place where all the data is gathered. The drone would behave according to the following (not final) life cycle:

1. Drone receives patrol coordinates;
2. Drone departs from hub
3. Drone patrols the assigned area and collects data
4. Drone returns to hub

## **2.4 Technology**

Due to our inexperience in this field, we are unable to determine correctly what kind of technology would truly be of use to our project.

## **2.5 Objectives**

The initial and main objective of the project would be to implement the basic functionalities in a simulation environment:

- Drone to drone communication
- Autonomous drone movement