

## **Drone Settings** (What kind of drone we use, what was the settings on each drone)

We collected data from a multi-hierarchical drone configuration using centralized-control communication networks, where we consider various mobility models and different amounts of drones as fleets. Each drone is operated by one GCS (in our case, we only use mobile devices as a GCS, which install multi apps to operate separate brands of drones), and all traces and computation processes are controlled by one single edge server (video analyzing on machine learning related is asynchronized, however the other is in real-time). To simplify our experiments, two parts of data are considered: drone video capture data and drone trace data.

On drone video capture data gathering, we collected video clips from 3 types of drones (DJI Phantom3 (specs: <https://www.dji.com/phantom-3-standard>), DJI Mavic 2 (specs: <https://www.dji.com/mavic-2/info#specs>) and Parrot Drone (on drone simulator <https://github.com/jmodares/UB-ANC-Emulator>), each with 3 different mobility settings (i.e., mission-based plan model, Gaussian-Markov model and random model).

Drone video clips are transmitted to GCS via a simple, reliable and widely available data link, such as IEEE 802.11. (Default in each drone - WiFi connection)

Part of traces are formatted as JSON files and stored in a NoSQL database. We calculate metrics on: (i) *the goodput through a network monitor at a GCS*, and (ii) *detailed flight traces information (e.g., longitude, height, speed (mph), ascent (feet))*. For every millisecond, one throughput data point is sent from the drones to the GCS for recording/archival. In addition, after the real-world experiment, we calculate the PSNR for transmitted videos to validate the utility of our machine learning model predictions.

## **Traces Data and Video Data**

### **Drone Traces:**

Traces in CSV format:

[https://drive.google.com/file/d/1TRB\\_RMLw-bCtIDPM87RP81ozsrJHKMBH/view?usp=sharing](https://drive.google.com/file/d/1TRB_RMLw-bCtIDPM87RP81ozsrJHKMBH/view?usp=sharing)

(We can upload and visualize the trace data from the interface tool we develop:

<https://github.com/alicesquivel/DroneCOCO.Net-Sim>)

### **Video Data:**

<https://missouri.box.com/s/aw13i2z34n6sst2gay957w0nc7zenacd>