1) **Read sensor data**
Both the current camera image, as well as information about altitude and camera attitude.

2) **Get reference mapping for approximate area**
Using a generous search area around the previous location

3) **Use Siamese Neural Network to determine location of camera view on reference mapping**

4) **Correct for offset caused by camera not looking straight down**

5) **Rinse and repeat!**
Each iteration is largely independent to previous iteration, which limits error propagation.





2

To train an effective model, more data is required and a longer training period. Ideally, this data would consist of paired aerial and drone imagery. This wasn't available during the Hackathon, so the model performance is limited.

Drone Images

Aerial Images

Model Training

Deployed architecture designed to be suitable for running on drone hardware (e.g. NVIDIA Jetson).

Model training can be done in Azure, AWS, or on-prem.

Image rectification (or perspective correction) is likely to significantly improve performance, but wasn't achievable on the timescales of the Hackathon.

Read Sensors

Image Rectification

Extract Map

Locate Image

Correct Offset

Drone Autopilot

Connecting up the algorithm to the drone autopilot should be relatively easy, but has not been done during the Hackathon.