Drone Pet Milestones

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This is a snapshot of all the milestones we talked about in the last presentation.
We're on track for all of them, the first 3 are completed, as we would demonstrate below.

We left out OpenCV Object Detection, as the given tag detection works very well till now. We only kept it as a backup in case tag detection gives us a hard time. So far, it has not been painful.

Milestone 1: Interfacing the drone with ROS
https://www.youtube.com/watch?v=5YSoXpPVoP4

The video shows how we've connected ROS to our drone. At the press of a key, it flies and tries to hover. And when I press another key, it lands and stops.

Milestone 2: Semi Autonomous Flight
https://www.youtube.com/watch?v=9BSX5ewNS3k

This video shows the drone flying up, after a few seconds it turns clockwise. Then lands. Unfortunately, it crashes towards the end because of a small testing area, but nonetheless it works.

Milestone 3: Tag Detection.
https://www.youtube.com/watch?v=hLIJ_e8qmCw

In this milestone, we wanted to show that the front camera of our drone is capable of detecting a tag. In the video, the drone is not visible (visible for a brief period of time at the end) , but rest assured it is right there in front of the tag.It detects the tag, and also how far it is fairly accurately.

Final Sprint - Fully Autonomous Flight Navigation.

Implementing a PID controller, that can follow the tag. We are not implementing SLAM or other Filter based algorithms because that is not really required. We do not require the robot to know it's actual location with respect to the environment. We ONLY require the robot to be centered on the tag. And if the tag moves, it should move too.

We're currently working on this sprint, and we're confident we'd be able to complete it.
We're splitting the work up into 2 parts:

1. Tag Following Drone - Due end of Week 8 - Aditya Bansal
2. Fine tune Bug fixes - Due end of Week 10 - Dhruv Kaushal

After this, we'd be collaborating on the Final Presentation together.