Agile Trajectory Generation for Tensile Perching with Aerial Robots

Progress Update

Produced a final version of the Interim Report submitted on Scientia.

- Checked the report using Turnitin for accidental plagorism.

For final report:

- There are a few diagrams that I would like to improve upon. But due to timing interests I have chosen to wait

Project Aim

- Design and Implement a Framework for Learning Agile Perching Trajectories from Non-Expert Demonstrations.
  - Aim to do a complete manuever of automated perching and unperching.
  - Using a small number of demonstrations to perform the required task.
  - Following demonstrations the agent should improve energy efficiency while still completing the perching task.
  - Not following a target trajectory - instead the agent will need to understand the goal of the task - this will include modelling of the tether.
  - Robustness to poor demonstration datasets (30%, 50%, 80%).
  - Compare to previously created trajectories for "smoothness", feasability and energy efficiency.
- Further defined via email and in interim report.

Plans Until Next

Begin work on the project

- Setup code repository.
- Bring in algorithms that have been looked at in background work (DQfD, NACfD, SAC, DQN).
- Start investigating realistic simulators for tether dynamics (Box2D, PyBullet).
- Work out how to start getting a demonstration data set.

Questions

- Feedback on Project Plan (sent via email or in Interim Report).
- Interim Report submitted - If there's any feedback on the Interim Report on changes to make towards the Final Report.