Agile Trajectory Generation for Tensile Perching with Aerial Robots

Progress Update

- Demonstrations
  - Meeting with Atar on Friday to discuss demonstrations

From Previously

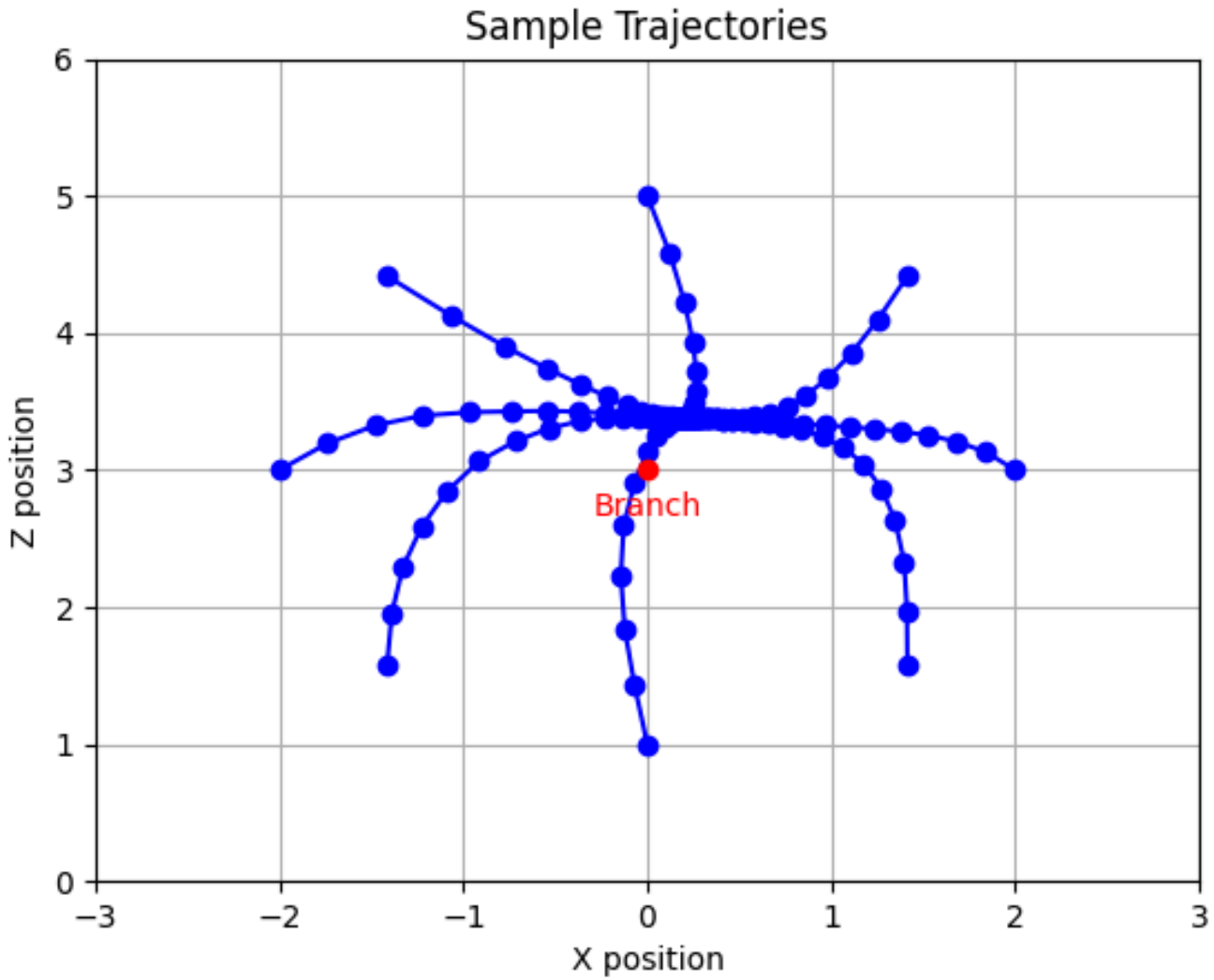
- Further Statistics on the training
  - Normalisation issue in the training data - where I hadn't applied the same normalisation to the demonstrations as I had in training.
- Reward Function
- Smoothness
  - Already a smoothness term which can be seen in easy tasks.
  - Introduce Prioritised Experience Replay to help combat the harder learning portions.
  - Sampling learnable parameter.
- Move onto next stage:
  - Wrapping

Reward

- Discussed last time about the level of tuning of reward function and whether that's what the right direction.
- Massively simplified the reward function
  + Distance to branch
  - Hitting branch
  + Wrapping
- Outcome
  - Without demonstrations - taking roughly 4-5x as long to reach a "good" point in training.
  - With demonstrations - 1.2-1.3x number of steps.

Wrapping Phase

- Currently achieving mixed results. From one direction, the wrapping seems to work. But from the other it struggles.
- Demo


Sample Trajectories
Z position
X position
Branch
6
5
4
3
2
1
0
−3
−2
−1
0
1
2
3

Next Steps

- Augment State Space with "directional" knowlege
  - Starting position in state space
  - Previous n states
- Hanging Phase