Skeleton of the paper

Introduction

Talk about why we need an algorithm for object handover.

What are some of the things the algorithm should help us overcome (safety of the object, person, drone, smoothness of the handover).

This is explored in robotic arms but it is required for an aerial mobile platform

What is the type of multirotor platform that we are using (defining vtol,)

%now we start with the lit review (no subheading, just another paragraph)

Firstly we will talk about how handover is done between humans, and how it is trivial for humans.

Then we will talk about robotic handover algorithms for any robotic platform. (tactile sensor paper, sensorless force estimation, vibrations paper etc), vision, force estimation, tactile sensor. We will write it in the following format:

In \cite{paper}, they use <explain the experiment setup><what is the novelty of this paper> <what is its limitation>

Mention that our approach will be a sensorless method(does not directly measure the force, or touch)

Then we will talk about literature that deals with quadcopters in particular (ukf for force estimation, machine learning for wind speed estimation. both of which are sensorless methods) mention the research happening in compliant controllers(cite the passivity based control paper)

Commented [ab1]: Maybe this should come before the sensorless approaches

%now for the really fine parts. Like the gripper

Mention soft parts used in other papers for gripping so that the object is not damaged during the handover. And mention payload delivery done by others(amazon, google etc)

%in a new paragraph we will talk about the contributions of this paper

Mention again the things that the algorithm should take care of(the same things that were mentioned in the intro)

This paper presents a novel machine learning based approach for sensorless algorithm for multicopter-human object handover.

Another contribution that we can mention might be that it can work for other platforms irrespective of the dynamics of the platform without needing to be retrained neural net.

In the same paragraph, mention the organization of the paper.

Theory

Start with the nonlinear model of the quadcopter and how we linearize it.

Then discuss the LSTM model(also mention briefly the hyperparameter searching) and why we think it will work. Including how the preprocessign the data into the required features happen.

The voting mechanism and the thresholding for the LSTM

System identification using mrft

Experimental results

First explain the things that are used in the experiment (for example the qdrone, the imu unit that is used in it, the Optitrack system etc)

Commented [ab2]: In abdulaziz paper, it has a different subsection, but in the tactile paper, it is just a new paragraph

Commented [ab3]: I think this sentence includes all the parts that we are doing in this paper. Using machine learning for "force estimation" is not done on quadcopters before. You can always do the things that arer done on a robotic arm by putting a tactile sensor on the drone, but our does not use any sensors so that is something good. Multicopter to human itself is not done to the best of my knowledge

Commented [ab4R3]: Because we can

Commented [ab5]: This is not that important because it is done in literally every drone paper

Commented [ab6]: How can we say that the features that are fed to the quadcopter can be used to see if there is and interaction

Commented [ab7]: Maybe we can show the change in the accuracy when different thresholds are used(this is done in the tactile sensors paper, autonomous robots)

Commented [ab8]: This is also not that important since all the work that is oublished from the research group mentions this

Test with 10 tests in each direction for different threshold values and plot how the accuracy changes with the change with the threshold value

Test with different controller tuning and plot the accuracy

Finally show the payload delivery (cite the video)

Conclusion

- What it proposes, and on what platform
- How it is novel (sensorless method, done in multicopter and mention the dynamics invariance)
- Experiment shows that what we suggested is actually demonstrated
- The limitations of the work (handover while it is moving,
- Future work (use this method for other tasks than the handover task