WEEKLY REPORT DE BENEDETTI MATTEO

WEEK 8: 21/10/2019 – 25/10/2019

VO PERFORMANCES DISCUSSION:

I talked with Martin Azkarate to decide how to proceed with the tests and we decided to wait a little more and see if the VO algorithm (Spartan) [1] that a colleague is working on might be available and replace the current library (viso2).

So we decided that I should help my colleague finishing the implementation of the Spartan VO in the RoCK framework, making it compatible with the rover camera (Bumblebee bb2) and the ground truth system (Vicon Tracker).

IMPROVING TESTING SETUP:

I have also been working on further improving the scripts related to the tests.
I implemented and successfully tested a new RoCK component that completely removes the need for the joystick and guides the rover through a series of velocity commands at certain times.
For example: at time 0.0 s start moving at 0.02 m/s, at time 200.0 s stop. This way a traverse of exactly 4 meters is achieved without the need of pressing the joystick continuously (and exactly vertical to avoid turning) for almost 4 minutes, while eyeballing the rover pose to try to achieve the desired 4 meters.

FUTURE OBJECTIVES:

The objective of the next week is to continue and hopefully finish the implementation of the Spartan VO, to then be able to compare it with the Viso2 library and decide which one to use for the tests.

And in the meantime I will better define the test that we intend to run as soon as a VO library is chosen.

CDF STUDY FOR A LUNAR MISSION:

During this week I continued working in the robotics team for the CDF (Concurrent Design Facility) Study for a Lunar Mission to investigate Regolith Sintering.
Our job was to size the robotic arm (both the links and the motors) and a Pan and Tilt Unit used to align a Fresnel lens to the sun and to pick a camera to be positioned on the end effector.
We also attended a session where the mass and power budgets and the TRLs of all the equipment were defined.
The next and last session is on the 5th of November and for that we need to prepare a final presentation explaining all the design choices and tradeoffs done during the study and the results of the tests that were conducted in our lab.

BIBLIOGRAPHY:

[1]: Kostavelis, I., Boukas, E., Nalpantidis, L., & Gasteratos, A. (2016). Stereo-Based Visual Odometry for Autonomous Robot Navigation. International Journal of Advanced Robotic Systems