RealSense T265 SLAM Testing on a Drone

Mitchell Cooke — cookem4@mcmaster.ca

May 2019

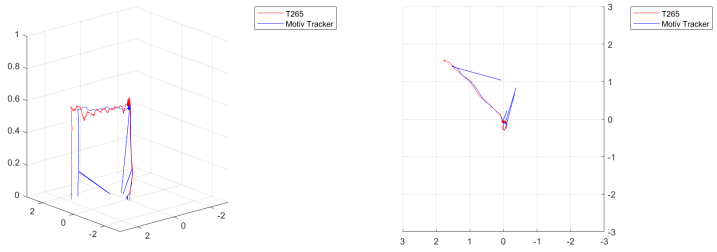
1 Introduction

This document outlines the results of testing the accuracy of the RealSense T265 camera when it is mounted on a drone. Two different paths were taken. The first involves raising the drone vertically, moving it along the XY plane, then lowering the drone. The second path traces the first path in the reverse direction to analyse the consistency of the T265.

2 Results

2.1 Path 1

Figure 1 compares the trajectory between the T265 and ground truth data along the collection path



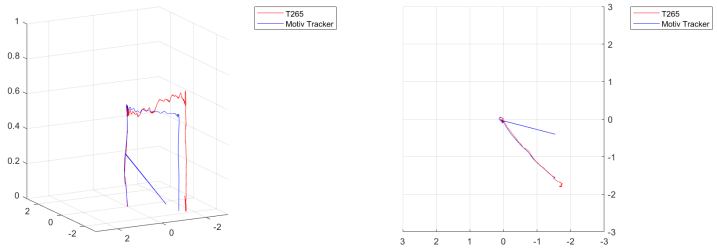
(a) Path Isometric view (b) Path Overhead view

Figure 1: Figures of Data Collection Path.

The sharp blue lines on the data collection path can be ignored and are due to moments of the rigid body not being detected. The data collected by the T265 compares very well to the data collected by the motion capture system with error along the XY plane being minimal. The noise on the Z axis appears greater than its true value due to the Z axis being a third the size of the X and Y axis. The final locations recorded by the T265 and the motion capture system differ by 27cm. This error is not from a heading problem as was seen with previous tests.

2.2 Path 2

Figure 2 compares the trajectory between the T265 and ground truth data along the collection path



(a) Path Isometric view (b) Path Overhead view

Figure 2: Figures of Data Collection Path.

Tracing the same path backwards shows a fair amount of accuracy between the T265 and the motion capture system. Again, the sharp blue lines occur at points where the motion capture system loses track of the reflective dots on the drone. The most noise can be seen on the Z axis where the T265 deviates from the ground truth data by about 15cm. The final positions of the T265 and the motion capture again differ by 27cm.

3 Conclusion

The accuracy of the T265 camera does not seem to be affected by the vibrations of a drone. The location calculated by the T265 is able to match that of the ground truth data with a fair degree of accuracy but with more noise present in position recordings.