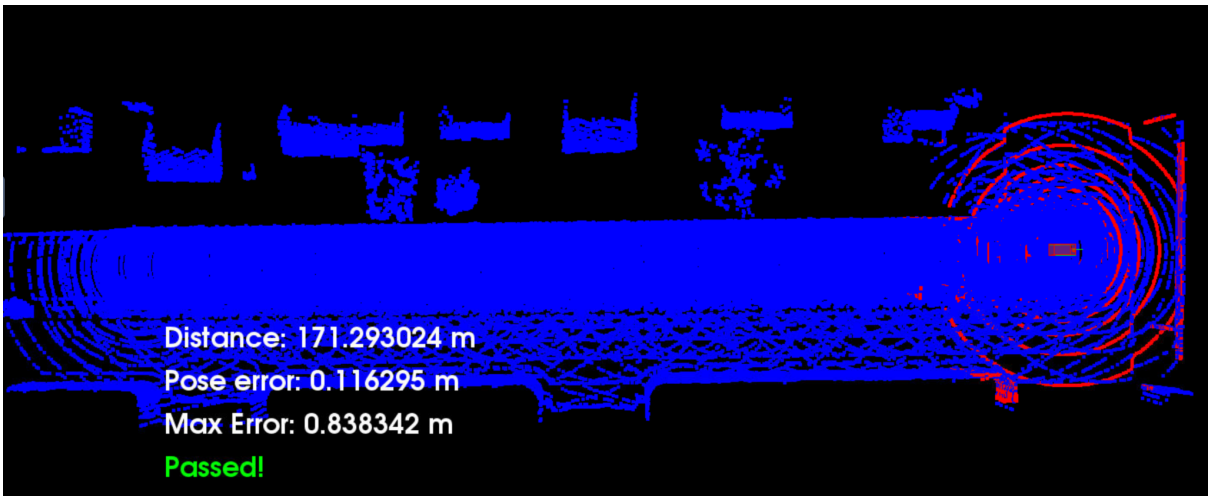
Scan Matching Localization

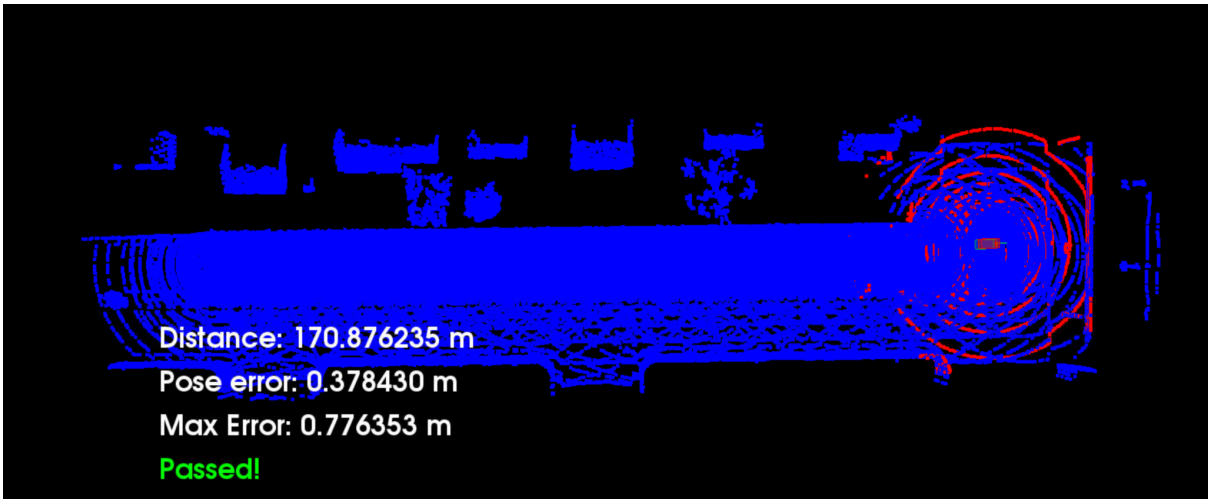
I did the implementation of ICP and NDT to be able to compare both techniques. I used a filterRes = 0.75 and iterations = 6 for both techniques.

In my first test for both techniques I performed the test wrongly, I didn't know that it was supposed to leave the car all the time with only 3 taps on the up arrow. In both tests I kept 'driving the car', the speed was increased much above 3 taps, and then I braked the car when I saw that the error was increasing a lot. As I was controlling the car I passed the 170m without any problem with both techniques. The NDT was the technique that I was able to use for the longest time at high speed, and braking less times during the test, it was the technique that performed the best.

ICP result:



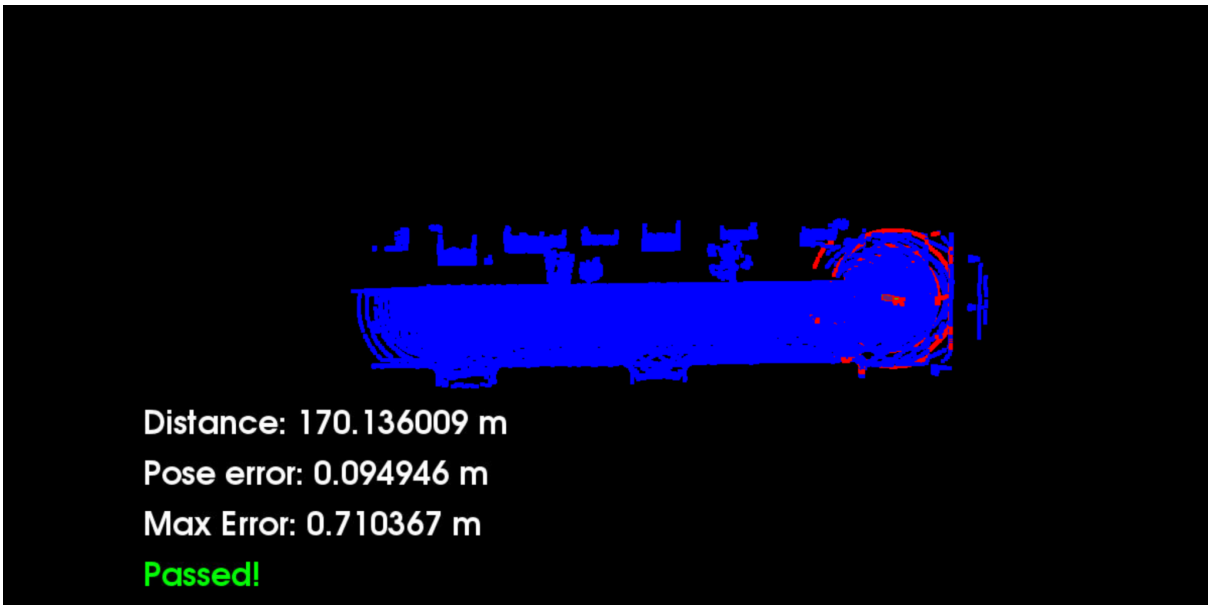
NDT result:



Then I checked that I should always leave the same acceleration of 3 taps on the up arrow all time, and then I did the test again with both techniques.
To my surprise in this test the error values were better (smaller error) than the test I “drove the car”. Both techniques passed without issue. Again NDT had the best performance with the least error.

One detail that I noticed, in the ICP the fps was much lower than in the test with NDT, I don't know if it was a problem with the simulator or had some relation with the technique itself.

ICP result:



NDT result: