# MPC-MAP Assignment No. 3 - Report

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## Task 1

Using the values that we measured in the first report I implemented pose prediction and then distributed the particles all around the map – I didn’t implement functions to check if the particles are in the wall, but if the particle leaves the map, it gets punished with very low weight.

A drawing of a square with lines and dots

AI-generated content may be incorrect.

Figure 1 - Distributed particles

## Task 2

After implementing the compute\_lidar\_function I created another function that compares LiDAR and MoCap data. For the weight\_particles function I used the Euclidean distance.

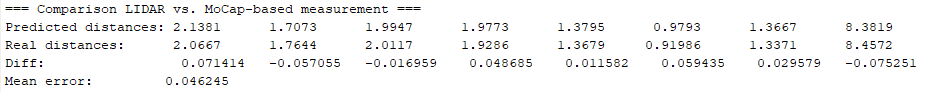


Figure 2 - Comparison of LiDAR and MoCap

## Task 3

In the resample\_particles function I used algorithm Low Variance Systematic Resampling and implemented injection of random particles for solving the kidnapped robot problem that helped the particle filter to work even better.

A diagram of a maze

AI-generated content may be incorrect.

Figure 3 - Stepping of the code - Step 1,10,20

## Task 4

For testing, I used the first and third maps. In the figure below, you can see a close-up of the robot and particles. Ive also implemented the estimate\_pose function, which calculates the robots pose using the median of all particles.

A close-up of a graph

AI-generated content may be incorrect.

Figure 4 - Close-up and how robot made it to the finish