Programme Execution Instructions

Question 1

In the folder ***RobotSimulator _Q1***, run ***Sim_DifferentialDriveWithObstacles.m*** with ***init_Q1*** and ***controller_r*** filled in the corresponding section to calculate the wheel radius; Replace ***controller_r*** with ***controller_l_w*** and run again to calculate the distance between the wheels.

Question 2

Run the script ***Sim_DifferentialDriveWithObstacles.m*** in the folder ***RobotSimulator_Q2***.

Question 3

Run the script ***Sim_DifferentialDriveWithObstacles.m*** in the folder ***RobotSimulator _Q3***.

Question 4

Run the script ***Sim_DifferentialDriveWithObstacles.m*** in the folder ***RobotSimulator _Q4***.

Question 5

In the folder ***Simulink***, run ***sisotool_method.m*** and open the session ***Max_Phase_Margin.mat*** to obtain the Control System Designer result; Run ***enumeration_method.m*** to implement the enumeration method of finding the optimal k_P; Double click on ***Simulink_Q5.slx*** to get the simulation of the system in Simulink, click on Run to get the three Scope result.

Question 6

Run ***ctr_discret.m*** in the ***Discrete_Simulink*** folder to get the discretised transfer function of the PD controller; Double click on ***Simulink_Q6.slx*** to get the simulation of the system in Simulink, click on Run to get the two Scope result.