CSCI 445 — Task-Sheet for Lab 6 & 7

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Robot ID: 5

Question:	1	2	3	Total
Points:	100	80	20	200
Score:				

NOTE: The points roughly reflect our estimate on how long each task should take.

1. Simulation

   (a) (30 points) Waypoint Following [TA Signoff] NZ
   List controllers and gains/clamping ranges used:
   PID theta: $K_p = 300$, $K_d = 0$, $K_i = 0$, $[-300, 300]$
   PID distance: $K_p = 1000$, $K_d = 0$, $K_i = 0$, $[-300, 300]$

   Plot (Make sure you save and submit as part of your solution) [TA Signoff] NZ

   (b) (70 points) Waypoint Following With Obstacle Avoidance
   Describe the algorithm you used in words or pseudocode:
   persistent modified algorithm
   Used controller to go-to-goal while NO objects detected if robot goes straight for 0.2 meters the move sonar to 0° degrees
   while object detected (within threshold):
   used wall-following PID controller w/ timer
   goes back to previous go-to-goal state.

   if wall-following:
   stop robot
   sweep sonar from -70° to 70°
   if object detected
   state = wall following

Gains and clamping ranges used:

PID Theta : $K_p = 1000, K_d = 5, K_i = 50$ [-300, 300] [-10, 10]
PID distance: $K_p = 1000, K_d = 0, K_i = 50$ [-300, 300] [0, 0]
PID Wall Follow: $K_p = 300, K_d = 0, K_i = 100$ [-300, 300]

Plot (Make sure you save and submit as part of your solution) [TA Signoff] N2

2. Robot

(a) (10 points) Waypoint Following [TA Signoff] N2
Gains and clamping ranges used:

Pid theta: $K_p = 500$, $K_d = 40$, $K_i = 20$ [-300, 300] [-10, 10]
Pid distance: $K_p = 500$, $K_d = 40$, $K_i = 20$ [-300, 300] [0, 0]

(b) (70 points) Waypoint Following With Obstacle Avoidance (
Gains and clamping ranges used:

Pid theta: $K_p = 300$, $K_d = 5$, $K_i = 50$ [-10, 10] [-200, 200]
Pid Wall Following: $K_p = 200$, $K_d = 50$, $K_i = 0$ [0, 0] [-50, 50]

3. Competition

(a) (5 points) Waypoint Following [TA Signoff]
Gains and clamping ranges used:

Plot (Make sure you save and submit as part of your solution) [TA Signoff]

(b) (15 points) Waypoint Following With Obstacle Avoidance
Gains and clamping ranges used:

Plot (Make sure you save and submit as part of your solution) [TA Signoff]

NOTE: Please zip all your code and plots and have one person in your group upload it to **Blackboard**. You will not receive any marks for this lab should you not submit your code by the end of the session. [TA Signoff]

NOTE: Before you leave, make sure you clean your workstation, return all robots and tools used to the front desk in the same format that you received them. If not done so, 10 points will be deducted. [TA Signoff]