

CMPUT 412: Experimental Mobile Robotics
Winter 2017
Competition #1
Date: February 1, 2018
Pursuit and Evasion

Objectives

- Improve the wander behaviour of your robot through motion control
- Implement the follow behaviour that maintains a safe distance to the target
- Practice competition strategy and preparation

Procedure

In this competition, each group will implement two separate behaviours in their robot, to be tested and compared with other robots in a competitive setting. Specifically, the first behaviour on your robot, *evasion*, will be to wander in an environment (CSC 2-29 and/or CSC 3-51) in a manner that prevents another robot from being able to follow it. In other words, the robot should move swiftly in the environment while avoiding any obstacles. The second behaviour on your robot, *pursuit*, will be to follow a leading or evading robot without bumping into it or any obstacles in the environment. You can use the wander node in Demo 2 as the basis for implementing the evading behavior. Also, refer to http://wiki.ros.org/turtlebot_follower for an example of how the following behaviour can be constructed.



At the start of each game of the competition, two robots are placed one metre apart with the same heading direction. The start of the game is signaled by pushing the blue “X” button on your Logitech joystick. If one minute elapses without the pursuer’s losing track of the evader, then the game is considered won by the pursuer. The teaching staff will determine (a) if and when the pursuit robot loses track of the evading robot, and (2) if any robot collides with any external object (walls or the evading robot).

Marking Scheme

With five groups, there are ten possible pairs of competitors and 20 games in total. The order of the games will be drawn randomly, and the two robots chosen to compete assume the evasion and pursuit roles alternately. The pursuer wins the game if it is able to follow the evader for one minute. Conversely, the evader wins the game if it is able to lose the pursuer in less than one minute. No restart is allowed. A group earns two points for each game won, and 0 points otherwise. At the conclusion of the competition, the total number of points earned determine the placement of each team, with the top ranked team receiving 100% of marks on this competition, the 2nd ranked 90%, etc. Two teams with the same point total will receive the same marks.