## CPS 607 – Autonomous Mobile Robotics
Lab 4 – "Flaming" world – passive target sensing and actuation
(Fall 2018-last updated 5 Nov 17**)**

The Environment and Concepts:
There exists a flat world of rectangular shape called "Flaming". It is the neighbor of "Lining" where all AMRs are equipped to fight fires. Flaming, like our previous worlds--except where it shares a border with Lining--is surrounded by a void. The AMRs of Flaming elected a President who built a wall ("The Freedom Wall") between the two worlds to keep out caravans of AMRs from Lining who he said were full of criminals. Problematically, the President ran out of money before the wall could be completed. As it cost so much to partially build the wall, the President of Flaming sold all their firefighting capabilities. Unfortunately Flaming now has an uncontrolled tea light fire 1 inch above the surface threatening their existence as a world.
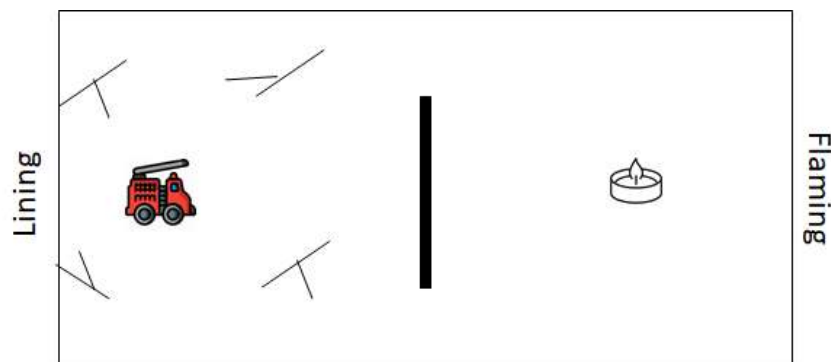
Required:
- Working in groups of 2 or 3, students are to create humanitarian AMRs that are capable of navigating to the single tea light and extinguishing its flame.
- Prior to the commencement of the lab, each group must present the TA with a printed, 1 page description of their robot, a description of their strategy for successfully completing the lab and the names and student numbers of the group members and the name of their AMR. (Diagrams and photos welcome).

Restrictions:
Group members should not touch their robot while it is being tested in the world. AMRs cannot exceed the dimensions of a cube with 12" sides. Groups can attempt the test a maximum of 3 times.

Scoring:
The lab will be marked out of 10 marks. Marking will cease once 10 marks are achieved.
Marks will be allocated as follows:
- 0.5 marks: 8.5" in x 11" printed sheet with the title "CPS697 Fall 2018 Lab 4" and all the additional information requested in the "Required" section of this document.
- 0.5 marks: Submit an edited video file named "CPS607Lab4<robotname>.mov" no longer than 1 minute showing the performance of their AMR.
- 5 marks: acquire flame and approach it.
- 5 marks: extinguish flame.
- -1 mark: non-sensor collision
- -4 marks: AMR splashes

There will be a 2 mark deduction for each time a student touches their AMR once it begins a run.