Search and rescue
Tests specification

Main specifications

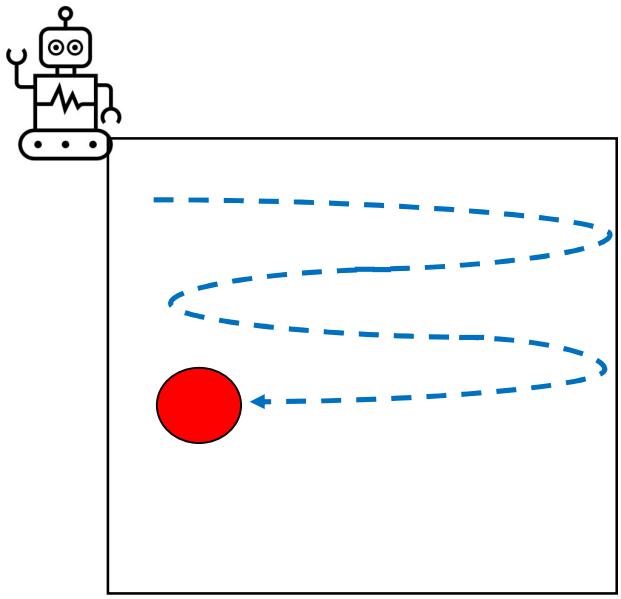
Problem to solve : create a robot that can search, find and rescue a defined object

- Bronze :
  - The robot is able to autonomously explore a square 1.5m x 1.5m area and detect the target
  - The robot is able to home in on the target
- Silver :
  - The robot is able to pick up the target and get back to his starting point
  - He is able to choose between multiple search path (at least 3) depending on the situation
- Gold :
  - The robot is able to report to a remote system, with a graphical user interface.

Bronze Test

Condition of test :
- The area is a square on the ground of 1,5x1,5 Meters, demarcated by any means (colored tape, cardboard, …) ;
- Drop one object inside, for example a red ball, a soda can (catchable) ;
- The robot starts at the corner of the square.

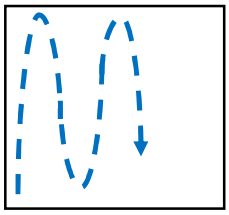
Verifications :
- The robot should explore the area (with the pattern of your choice – example of the “snake” pattern on the scheme below), and stop when it detects the object ;
- The robot has a coordinates system (polar, Cartesian, …) with (0,0) being his starting point ;
- When the object is detected, the robot register the coordinates of the target and comes back directly to his starting point ;
- The robot has to be able to communicate the coordinates (on screen, by voice, …) to the user.



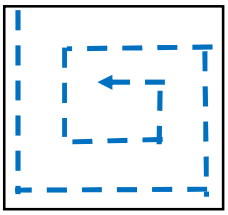
Silver test

Condition of test :
- The area is a square on the ground of 1,5x1,5 Meters, with one object inside, for example a red ball (catchable) ;
- We can choose between 3 search patterns before start (snake, Expanding square, Sector…etc) ;
- The robot starts at the corner of the square.

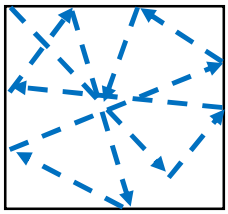
Verifications :
- Same as bronze but with 3 different patterns.



Snake



Expanding Square



Sector

Gold test

Condition of test :
- The area is a square on the ground of 1,5x1,5 Meters, with one object inside, for example a red ball (catchable) ;
- A wirelessly connected command and control computer (C2) with a graphical or command line user interface is connected to the robot ;
- This C2 let the user choose between 3 search paths before start (snake, Expanding square, Sector…etc) ;
- The C2 let the user send commands to the robot (start, stop, drop object, pick up, go home, etc) ;
- The robot starts at the corner of the square.

Verifications :
- Same as silver level ;
- We can see on the graphical user interface the coordinates of the target, and different robot steps and/or status (start, search, target pick up/missed, home come back) ;
- The robot acts accordingly when a command is sent.

All other parameters of the project are free to be set up as the team prefers, but ask your teachers if you have a doubt !

Good luck !