



TDDC17 ARTIFICIAL INTELLIGENCE :

Lab 2 : Search Algorithms

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1 Implementing CustomGraphSearch

1.1 *Aim*

This first lab session explores the concept of intelligent agents. The agent is a Vacuum cleaner evolving in a simple grid. Each square of that grid is either clean or filled with dirt. The agent can only perform basic actions : move forward, turn right, turn left and suck. The purpose of this lab is to write an algorithm to automate the cleaning process. No supposition regarding the world dimension or the dirt position can be made. The vacuum cleaner has to be completely autonomous.

1.2 *Strategy*

Given that this first assignment does not imply obstacle avoidance, it is possible to implement an easy 3-step strategy : The variable *uMovement* is used as a conditional counter in this sequence.

This sequence is composed of three movements :

- Turning 90° in the given direction (*uMovement equal to 0*)
- Moving forward, down to the next grid line (*uMovement equal to 1*)
- Turning again in the same direction (*uMovement equal to 0 again*)

1.3 Possible improvement

Given that the java GUI give us the ability to add obstacles in the grid, an interesting improvement would be to implement search algorithms in order to find the best path while avoiding collision.

FIGURE 1 – Screenshot

2 Theory

Question 1

Question 2

Question 3

Question 4

Question 5

Question 6

Question 7