

AUV-IITB Recruitment

Computers have typically been used to solve real-life scientific and engineering problems. As computer engineers, you are expected to model real-life problems and implement them!

Task 1: Sliding puzzle problem

Sliding puzzle problems are very standard problems studied in the field of Artificial Intelligence. Details of the “Fifteen problem” (one of the sliding puzzle problems) can be found here: http://en.wikipedia.org/wiki/Fifteen_puzzle. Your first task is to write a program which solves this problem.

Given an initial (distorted) state of the board, find a sequence of moves which lead to the "sorted" position of the board. Keep flexibility while writing the code so that we can easily test your algorithm on any random initial state of the board.

Task 2: Robot Simulator

Imagine a "point" robot living in a two-dimensional world. The robot has a fixed velocity but its orientation can be changed to any direction (say using a steering wheel). The robot also has a sensor which senses the perpendicular distance of itself from the X-axis. The aim of the robot is to move along the positive x-axis while trying to keep its y-coordinate to be zero. This is VERY similar to the line-follower robot! To follow the line, the robot uses a PID controller.

Implement a program which simulates the environment and the robot. Display the path travelled by your robot in the simulated environment. Add some noise to the sensor measurement to remove the ideality. This would imply that the robot would take different path each time you run your simulator.

Refer to <http://www.udacity.com/overview/Course/cs373/CourseRev/apr2012> for some guidance in this problem

A Few Guidelines

- Both the programs needs to be written in C++.
- Add a README file along with your code to explain how to compile, run and test your code.
- Please document the code whenever it demands!

Good Luck