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A Survey on Neural Network in Robotics

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Abstracts: *The robotics plays an important role in this digital world. The neural network in robotics is the wide spreading concepts. In this context we would like to stress on the process of neural networks in robotics by the use of vacuum cleaner. A robot is an invention which serves as a computer and so it can be used by the higher authorities to serve works to their house hold workers and also the capacity of robots can be accessed with the help of neural network.*

The vacuum cleaner robots should have a mechanisms for example the 'artificial intelligent '(AI). The artificial intelligence (AI) is used to automate the system and to work independently without human intervention. Neural networks is a parallel computing devices, which are basically used to make a computer model of the brain and this model we can easily add the entire environment areas taking account into a some factors, such as the number of length and turns of the Trajectory. The PPCR (path passing of coverage region) known as robot mechanisms or tasks. We used to resolve PPCR for a purpose of an evolutionary approach.Neural networks have two types were it can be tested and trained on a real robot for a landmark recognitiontasks. First is a multilayer perceptron and second one is learning vector quantization, these are all can be investigated by a neural networks. These types of neural networks were found to be successful in recognize. The natural landmarks can be selected for example of neural networks is a Rambo. It is a time tested technology, where we can easily set a time as well as space distance. Then it can be easily do their job can be successfully.

I. Introduction:

The modern definition of a robot can be electro-mechanical device which follows a set of instructions to carry out certain jobs, but literally robot means 'command processor'.

It also acts as a remainder, as it helps the owner by remaining him the schedule which is to be followed by him. Robotics can be termed as a science of study of the technology primarily associated with the theory, fabrication, design, and application of robots. Here, not only the computer field but also the other fields contribute the mathematics, the techniques and the components, robotics creates the magical end product. The fields of mathematics can be used in various branches. Now a day the vacuum cleaner is the major role to help a household works where it is easy and also it can be a proper cleaning by providing a little intrinsic satisfaction is known as autonomous domestic vacuum cleaners. These neural network robots able to cover the entire floor. In robot we can set the map of environment then it can be ensure that no area is missed by the robots. The different requirements of mapping constrain recognized the first Cao, for point-to-point navigator and region filling navigator. The point-to-point navigator, is built in a map environment is built in an exploration phase to expose all the segments of path. This mapping environment used for planning optimal path between points during navigator. In region filling navigator, is to be able to cover all over the area of a floor. When the vacuum cleaning robots starts to vacuuming the floor then it can be exposed floor area for each time. It's more efficient as well as efficient to build the map while vacuuming. Even though a separate exploration phase is to be superfluous, vacuuming navigation may be improved by using the previous build world model. It's also needs to contains information for a specific

Vacuum. For example: the area has to be cleaned, within the short period of time and easily managed.

ROOMBA
Note: Roomba will not power save, while it enters into a full mode.

KEYWORDS: topological world model, vacuum cleaning, neural robots, Roomba.

Since various people have been worked on the problemof world modeling for autonomous vacuuming Robots. Hofferhas developed a path planner for cleaning robots working in public areas. However, the system relies on *a priori* knowledge of the environment. For example domestic vacuum cleaners, it is implemented that users do not have to input for full floor plans of their houses.

5Gonzalez is the name of a vacuum product uses an occupancy grid to describe the environment. The floor area, represented in a grid mapping constrain, is subdivided into rectangular regions. It can only handle rectangular obstacles. Lang does not use any standard world modeling methods. The IRobot first follows the outermost walls of the room. At the coordinate of points along with the walls are remembered and marked as ends of cleaning tracks. These tracks are completely covered the area within the outermost walls. The problem approach with the points is remembered as absolute coordinates only and dead computation is used to locate and follow.

As a result, the system is very susceptible to odometers error.One way to recognize natural landmarks is to create explicit rules for the types of landmark selected. For example, when anIRobot is in a concave corner, range sensors should return short range readings for two sides of the robot. In these demonstrations and, a description of the environment only exists around the landmarks. All other areas are described only ways between landmarks. An alternative to predefined landmarks is to use a clustering algorithm, forexample self-organizing maps, to partition the environment into regions. A node is assigned to each region, and neighboring regions are connected together with edges.

1. Topologically of a World Model

In the process of world model, the environment to be vacuumed is described topologically using concave and convex corners as landmarks. These landmarks are connected with travelling paths. Figure 1 shows how a typical environment is

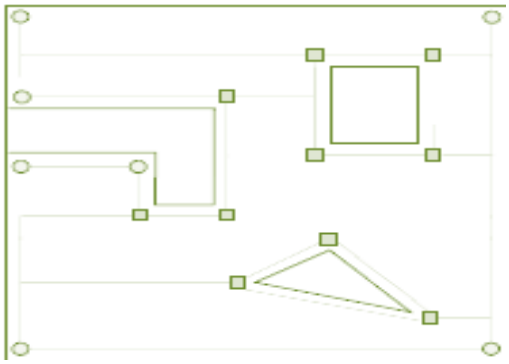


Figure 1: Topological world model for an environment.

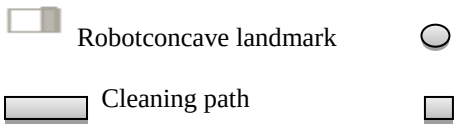


Figure 2: Symbols used in the figures.

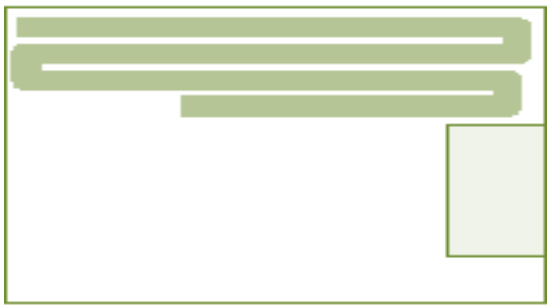


Figure 3: Vacuuming a room systematically using a Zigzag pattern.

Robot concave landmark convex landmarkPosed world model. This world Model can be stored as a bi-directional graph, where Landmarks are the nodes and travel ways are the Edge. The location of the IRobot at any time is given by the node or the edge it'son. The topological world model of an environment is constructed incrementally while the IRobot is cleaning. Aninitial corner of the room, the IRobot moves in a zigzag pattern down the room until it is completely covered (figure: 3).The distance between tracks shown in figure 3 is for visualization purposes only.

Figure 4: (a) Initial world model. (b) It can be add a new node at the end of the first track.

In a real world implementation, there will be overlap between tracks to ensure a more in-depth clean. The set of rules assumes cleaning starts at a cornerof a room (figure 4(a)). As shown in the figure, the initial node has 2 edges. These two edges representthe two unmapped directions of the initial landmark. The corresponding edges andNodes are added to the world model whenever the robot discovers a new landmark. Figure 4(b) depicts the robot discovering. The second landmark while cleaning the first track after leaving the initial corner.

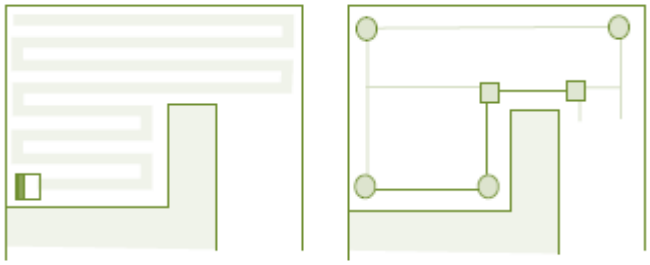
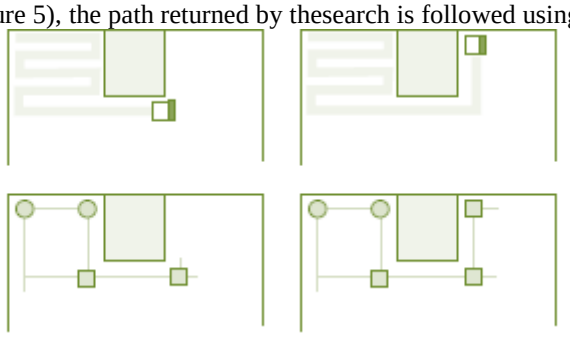


Figure 5: search for aUN cleaned region when there are no more cleaned tracks

Left at current position. The way returned by breath-first search is highlighted.

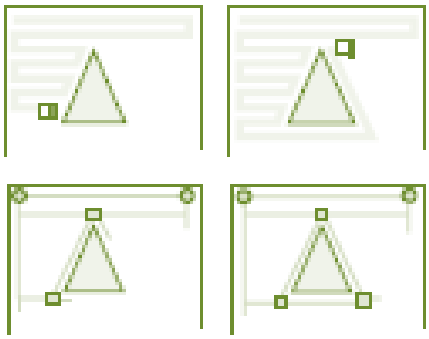
If the robot is at aconcave corner and there are no more free tracks in the current position. This robot can easily carry out on the worldmodel, to find the closet incompletely connected edge. Ifhe edge can be searching has been done .to find any unclaimed directions in the whole environment. An edge can be finding and search can be show in (figure 5), the path returned by thesearch is followed using a wall following strategy.



(a) (B)

Figure 6: (a) A new 'top side' region is discovered. (b) The newly discovered region is cleaned first.

The zigzag cleaning pattern tries to cover the room from top-to-down. Sometimes, a new region on the 'top side' is discovered while the robot is at convex corner(figure 6(a)). In this case, the robot cleans this newly found region first before moving onto clean the rest of the room (figure 6(b)).



(a) (B)

Figure 7: (a) cleaning one side of a free standing area of obstacle. (b) Moved to the other side of the obstacle

The IRobot resumes its normal top-to-down zigzag cleaning pattern only after both sides of the free-standing obstacles are covered. Figure 7depicts such a situation. Figure 7(a): the IRobot has nearly finished cleaning one side of obstacles. In figure 7(b), the robot has moved from the first to the second side of the obstacle, and is starting to clean, in a zigzag pattern, the second side.

How to design a Roomba or preprocessing

The Roomba is a software interface for controlling and manipulating Roomba's behavior is also known as Roomba open interface (OI). It can be used through a sensors series of command, including mode commands, song command, actuator command, sensor commands and cleaning command, that we can send the information through your mobile phone as well as a pc.

Advantage of Roomba

1) Energy saving
2) It won't take a bit of time
3) It always ready to do their works safe and full mode

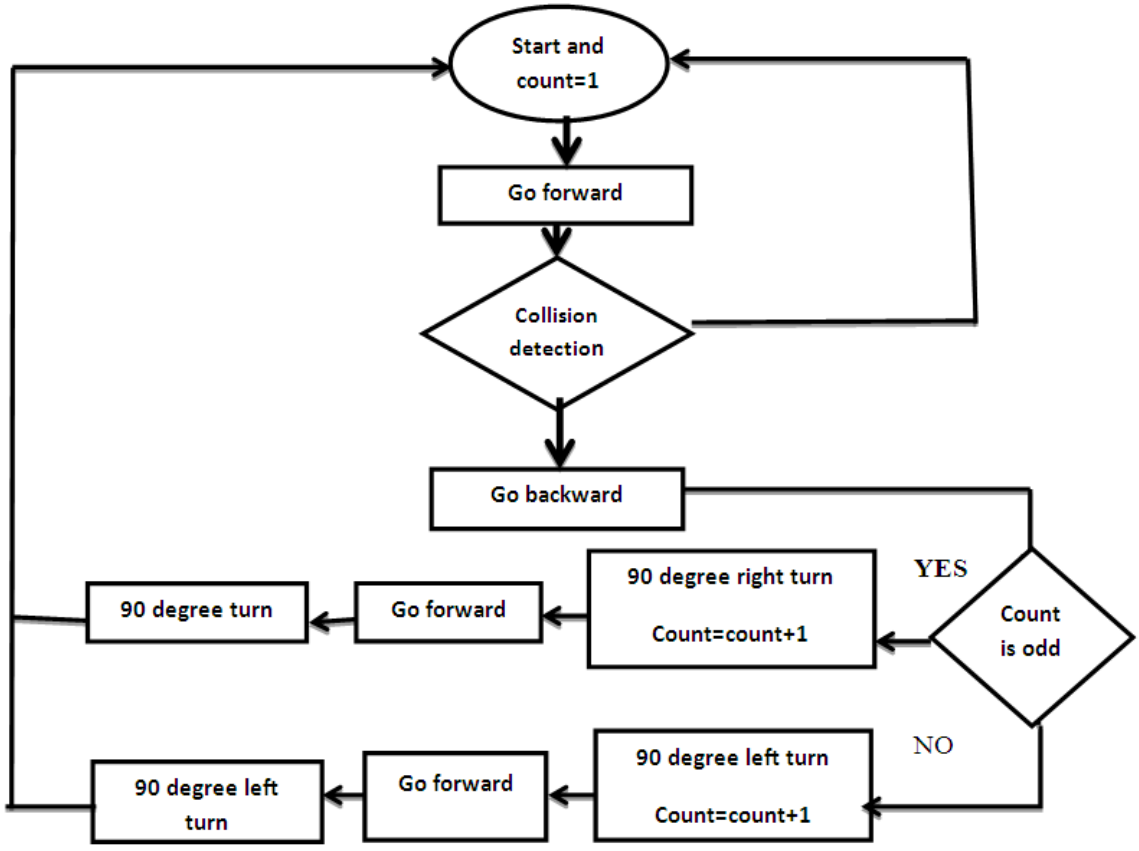


Figure 8: Working of Roomba

Roomba open interface mode

Roomba (OI) has been 4operating system

1) Passive mode
2) Safe mode
3) Full mode
4) Off mode.

Off mode: The Roomba will be in off if we want operating the Roomba then we can able to choose any four of the operating system.

Passive mode: Passive mode is used to give a command to a Roomba for any particular area such as spot, clean, dock.

Safe mode: If we are given a safe command to a Roomba then it can be able safe mode or a (OI mode). But it can't be able to detect while it's moving, also it can't be able to detect on a wheel, when it's charged in a powered.

Full mode: When you send a command to (OI), Roomba enters into full mode. In full mode when (OI) are send any command to the Roomba then Roomba will be wait with all motors and LEDs and does not response to any other sensors .

II. Conclusion

In this concept, we describe a preview topological world model with the help we can be operate and used by an artificial intelligent. Theimplementation of the proposed world model on a real robot the topological world model is the basic content of a robot model. And in this we are used autonomous vacuuming robots. Human can easily give an instruction to robot as well as we can set the time, and we it can be received the information. The Roomba robot is used to clean the mapping environment as well as it can able to do a work faster than human being. In this paper we described as the Roomba box robot. It is very useful for household work. It can be more sufficient and easy to handle.

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