MAZE SOLVER

Project Overview

A project on maze solver where the machine will be finding the shortest path to be out of the maze. Concepts of **“Q-learning”** will be applied for solving the maze. Main applications of such automated maze solving robots are, automated crate moving within a warehouse, military applications may involve, robots traversing unknown terrain while avoiding or moving obstacles out of the way and in rescue or emergency scenarios whereby robots are required to go into hazardous situation.

Problem and Solution Statement

The problem is solving a maze and finding the shortest path to achieve the result is difficult and time consuming which in turn uses a lot of resources and man power and understanding. Thus, all these consequences that we face can be solve by intending the machine to find the shortest path from the maze by applying the basic knowledge of **machine learning** specifically **reinforcement learning**.

Benchmark (How this solution is better?)

There are various methods to solve the problem and get the shortest path. The method used here is based on **reinforcement learning** and its sub part “**Q-learning**” with is based on the pervious output and updating the learned path on the next condition.

Implementation strategy

The workflow will start with learning the basic concepts of **machine learning**, **reinforcement learning** and “**Q-learning”**. Further on we will apply our learned concepts GUI based maze and find the shortest path for it. Then we will try to combine our concepts and prepared GUI solution to the machine.

We will be using :

* [2 Micro Gear Motors](http://www.amazon.com/gp/product/B00EIAXQWC/ref=as_li_tl?ie=UTF8&camp=1789&creative=9325&creativeASIN=B00EIAXQWC&linkCode=as2&tag=patmccmak-20&linkId=TWUKNTIPME2YVI7I)
* [Pair of Motor Brackets](http://www.amazon.com/gp/product/B00DKYMXE4/ref=as_li_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=B00DKYMXE4&linkCode=as2&tag=patmccmak-20&linkId=SHHJAUMP4SMKFCFM)
* [Pair of Wheels](http://www.amazon.com/gp/product/B00EIB1FRY/ref=as_li_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=B00EIB1FRY&linkCode=as2&tag=patmccmak-20&linkId=PWM7LXFAKJOMQMQI)
* [Ball Caster](http://www.pololu.com/catalog/product/951)
* [Analog Reflectance Sensor Array](http://www.pololu.com/catalog/product/960)
* [Arduino RBBB](http://www.wulfden.org/TheShoppe/freeduino/rbbb.shtml)
* [Motor Driver IC](http://www.pololu.com/catalog/product/24)
* [4AAA Battery Holder](http://www.pololu.com/catalog/product/1159)
* [4 Rechargeable AAA Batterie](http://www.amazon.com/gp/product/B00CWNMW1S/ref=as_li_tl?ie=UTF8&camp=1789&creative=390957&creativeASIN=B00CWNMW1S&linkCode=as2&tag=patmccmak-20&linkId=ZFYVK2KC2XUABPTE)s

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