

Green Team TurtleBots

Maze Exploring Robot

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The Project

Our team has been tasked to work with a self-balancing 3-dof robot as vehicles equipped with sensors to explore the maze. It is to traverse a maze and collect data such as location, orientation, distance, angle and eventually find all 4 of 20 pieces of treasure in the maze when it goes through the maze and record location of treasure, orientation, distance and sensors. The overall theme is going to explore the robot as a mobile platform and how it go through the maze collecting points by exploring treasure and detecting monster and finding way out of the maze.

The Mission for success

The path we chose for success in the competition is the route of only 100% exploring meaning when we go through the maze in the robot may possible to get the fastest finding time, we believe that the faster we find the treasure the better chance we have and we can save by going through all of the maze and the distance of maze is higher the longer the time take to the treasure. Also to be that will not depend on the sensor as the priority is accessible time. While also trying to accumulate as many points possible if the path allows for multiple treasure items.

Card Reader

It is imperative as the card reader to be Figure out a way to read the cards that are given in the maze to capture amount of time.

Research

Avoid Abstraction's
Quantitative terms
Good Rig





Fig 1

Card Reading Sensors



Camera sensor RFID Sensor IR Sensor


Sensors comparison

	Camera	RFID
Benefits	Less cost and size for the maze	More reliable and easy to use
Negatives	More complex and harder to use	More expensive and harder to use

Qualitative Quantitative

Test Calc Sim

Camera's



Pi Zero Vision Sensor ArduCam Module HoloKit 2.0/3.0

Comparing Cameras

Camera	Resolution	Frame Rate	Price
ArduCam Module	1280x720	30 FPS	\$15.00
Pi Zero Vision Sensor	1280x720	30 FPS	\$15.00
HoloKit 2.0/3.0	1280x720	30 FPS	\$15.00

100% = 100% Mission point

100% = 100% current

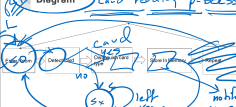
100% = 100% power

The Camera for the mission

Choose the camera that is best for the mission. The camera should be able to detect the treasure and record its location. The camera should be able to detect the monster and record its location. The camera should be able to detect the exit and record its location.

Diagram

Card reading process



ISO Detect card read card read left down

Navigation

My Role as the Game Design engineer is to figure out a way to have the Robot able to explore the maze in the maze and collect info about the maze such as the location of treasure, orientation, distance and sensors during the exploring phase as in the maze the robot will be able to find the treasure and record its location.

Amurvaiki

Research

we are requesting Approved

The user will be able to find the treasure in the maze in the fastest way possible. The user will be able to find the treasure in the fastest way possible. The user will be able to find the treasure in the fastest way possible.

Sensors comparison

	RFID	Camera
Benefits	Less cost and size for the maze	More reliable and easy to use
Negatives	More complex and harder to use	More expensive and harder to use

RFID Camera

Sensors

RFID Sensor

Camera

RFID Sensor

Camera

The Sensor for the Mission

After research and comparison the type of sensor that is best for the mission is the RFID sensor. The RFID sensor is the best for the mission because it is the most reliable and easy to use. The RFID sensor is the best for the mission because it is the most reliable and easy to use.

Lidar Sensor Comparison

	Range	Refresh	Cost	Power
Lidar-Lite v3	150m	270Hz	\$125.00	130mA
TFMini-Lidar	120m	10Hz	\$44.95	20mA

Lidar Sensors

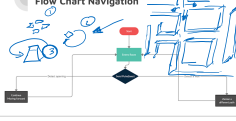


TFMini-Lidar Module Lidar-Lite v3

Sensor Picked

TFMini-Lidar Module, since it is more cost effective and works for its intended use in the range of 120m and size of 120mm. The sensor is the best for the mission because it is the most reliable and easy to use. The sensor is the best for the mission because it is the most reliable and easy to use.

Flow Chart Navigation



Start Stop

Control Engineer

The control engineer will be able to find the treasure in the maze in the fastest way possible. The control engineer will be able to find the treasure in the fastest way possible. The control engineer will be able to find the treasure in the fastest way possible.

Research

The research has been going through books of physics and the theory of the maze. The research has been going through books of physics and the theory of the maze. The research has been going through books of physics and the theory of the maze.

Sensor

	Price	Dimensions	Size
RFID	\$15.00	1.5 x 1.5 x 1.5	2.5 x 3.5 x 1.5
Camera	\$15.00	1.5 x 1.5 x 1.5	2.5 x 3.5 x 1.5

The Sensor for the mission

RFID sensor

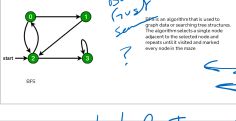
Game Software

The game software engineer will be able to find the treasure in the maze in the fastest way possible. The game software engineer will be able to find the treasure in the fastest way possible. The game software engineer will be able to find the treasure in the fastest way possible.

Research


The research has been going through books of physics and the theory of the maze. The research has been going through books of physics and the theory of the maze. The research has been going through books of physics and the theory of the maze.

Algorithms: BFS



BFS

Algorithm: DFS



DFS

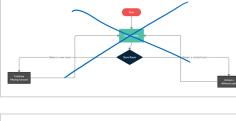
methodology and algorithms comparison

	BFS	DFS
Pros	Simple and easy to use	More reliable and easy to use
Negatives	More complex and harder to use	More expensive and harder to use

Algorithm Picked: BFS

BFS

Flow chart: Game Software



Start Stop

Concluding thoughts

After doing research this is what we came up with for the maze project. We are planning to make more research and spend more time with coding up with paths to explore the maze and win the game.

Possible level 1 requirement

After doing research we have some level 1 requirements that we are going to use. The requirements are to find the treasure in the maze in the fastest way possible. The requirements are to find the treasure in the maze in the fastest way possible.

Level 2 Requirements

The requirements are to find the treasure in the maze in the fastest way possible. The requirements are to find the treasure in the maze in the fastest way possible. The requirements are to find the treasure in the maze in the fastest way possible.

Qualitative
Quantitative

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simulac
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test

What do I want

deg. streamer

A-Star

more easy

weaker