



Line follower Robot using V-rep

Overview

In this task team is supposed to implement a Line following vehicle in a virtual physical environment using software V-rep. The Robot will be using proximity sensor instead of IR sensor and visibility of line will be on and visibility of background will be 0 for proximity sensor in order to mimic the color inversion in V-rep.

Task:

Learn physical modelling in Vrep (Day 1):

Learn how to make a physical model of robot using basic steps in V-rep. In this task you should try to learn how to make your robot using basic shapes available in V-rep and also how to configure a joint in V-rep simulation software.

Implement design of your Robot (Day 2):

In this task you need to implement a model of your robot in V-rep (you must take care about configuring the joints).

Control wheels using Lua script (Day 3 and 4):

Here you need to make an lua script controlling wheels of your robot i.e. joints. In this task you need to move the robot forward and backward for 3-4 seconds (no need to implement remote, you can use some logic in your lua script).

Learn how to make lines on ground (Day 5):

In this task you need to create a path for your line follower and you need to set it as ground.

Learn to implement IR sensors (Day 6):

In this task you are supposed to implement an IR sensor and also to generate a lua script to sense its data.

Finalising your Robot (Day 7 and 8):

Here you need to put all together to make your robot fully functional (following same rules you have performed in task 1.extension)

Final Version:

You need to generate a simulation file for simulating a fully functional line following robot. Your final presentation or submission path must demonstrate all the conditions described below.

1. It must be able to follow black as well as white lines.
2. If the color of background and lines inverts the robot must work.
3. It must be able to take any curvature turn.
4. It must be able to take a right angle turn.

After completion of the task you have to submit a documentation of your work including explanation of using V-rep.

Submission you have to submit on github as instructed.

Resources:

Learn how to make model:

<https://youtu.be/YcfARpQVKhU>

Learn components of child script:

<https://coppeliarobotics.com/helpFiles/en/childScripts.htm>

Hint:

no need to learn the whole Lua language though it's very easy like python. Just explore the function and its definition which is required for you. To control joints use the function "sysCall_jointCallback". From Lua language you can directly call the data of orientation of a body using some built in function. Note that the joint is having various mode and you are using right mode for your implementation.