Autonomous Ground Robot

ABSTRACT

Our main purpose of making this project is to learn new various technical and mechanical aspects. Making an autonomous robot (like an UGV), being a fairly challenging task, is a good means of learning these aspects. Our main idea is to make a robot that runs on the ground autonomously in which the position where the bot has to go is given by the user.

IMPLEMENTATION STEPS

For the autonomous part, the bot will navigate through a given specified area, with help of sensors to avoid obstacles. Here the "specified area" will be a region of a particular dimension(possibly 10*10 ft), like a map. At the border of the area, we will put small light sources (possibly LED lights of different colors), which act as transmitter, and we will put cameras on the bot which will act as receiver. From this we will calculate the position of the bot on the map. In short this will act as local positioning system of the bot. From this we will be able to give the bot the position, where it have to go. Further we will have other sensors on the board which will make the bot to avoid the obstacles locally. The user will be giving the destination via computer.

COMPONENTS REQUIRED

- Beagle Bone/ Arduino
- Wheels
- Aluminum Chasis
- 4 Motors
- Li-Po Battery
- ICs
- Infrared Sensors
- Bread Board for testing
- Camera
- Other Various Electrical Components

TIMELINE

Week 1: Studying the components and planning the project, designing, purchasing required components, learning opencv, construction of basic structure and making its CAD in Solidworks.

Week 2: Start coding for the image processing part of the bot to make the positioning of bot. Completing the structure of bot, i.e., putting the electronics, sensors and camera in their positions.

Week 3 & 4: Testing the code and finding the bugs present in it. Making the arena for the bot where the we will put light sources at their boundaries. Debugging the electronics of bot.

Week 5 & 6: Debugging the code of the bot and any other bugs.

COST : Rs. 5000-6000

TEAM MEMBERS

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