SOUND FOLLOWING ROBOT

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Introduction

This project is an experimental approach towards a higher level design of locating a sound source in an environment where finding objects is not possible due to poor conditions such as unavailability of light.

The two-wheeler robot, with the help of 3 sound sensors, moves towards the source of sound, to a certain degree, as long as it is able to detect it.

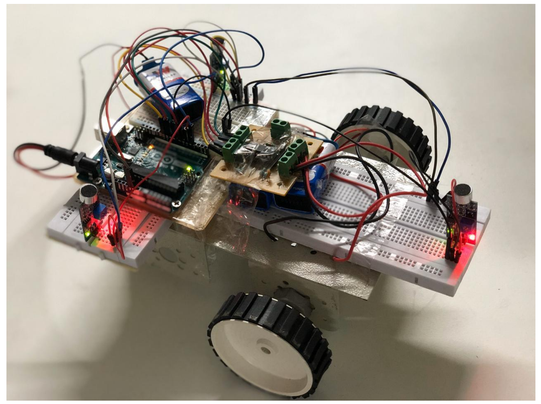
Materials and methods

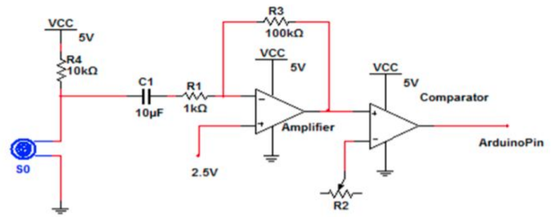
Major components used are :

- Arduino uno
- Battery (9 V)
- Motors
- Bot Chassis
- Wheels
- Microphones (Sound Sensors)
- Voltage Regulators (IC 7805)
- Resistors and Capacitors

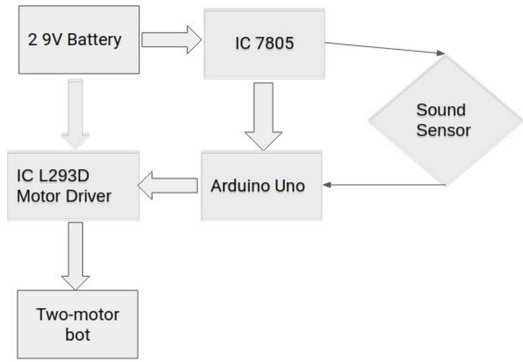
Results

The robot, powered by 3 9V batteries, remains in a steady state , until a sound is generated, during which, one of the sensors (left, right, front-centre) detects the direction of sound, and the robot moves accordingly. As soon as one of the sensors detect sound, a delay is produced for other sound sensors, to deal with the echo problem.





Circuit diagram of the Electret Microphone Sensors



Conclusions and future work

To improve the accuracy of sound detection and make the robot move with more precision, we can use the Trilateration Principle.

There are many different areas of use for sound localization. This concept is not only used to localize a person that is talking but can also be applied for finding a person in need.

Another version would be to use greater number of sensors in a 3D arrangement and applying more complex mathematics to identify the exact location of the source with respect to the bot's position, which can very well be implemented in applications like Search and Rescue operations, providing information about the exact location of the lost object/person.

References

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