

Autonomous Pick & Place BOT

Student Innovation Category

Problem Statement: In warehouses, we come up with situations where we have to place heavy goods or products from one place to another. Mostly in warehouses in India human labor is used or forklifts which can be operated by humans. Here arises a need for an automated solution.

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Description of Idea:

We are coming with a solution by designing an automated robot which is adaptive to any given environment. The user can communicate with the Robot by the GUI on the browser. The bot itself generates a map of the room of certain dimensions and sends it to the browser. The Robot is programmed in such a way that it one by one places all goods to the mentioned location. Using this bot will be cost-effective for the manufacturers as once being purchased it requires electric power to function. Efficiency will also increase as we are switching from Human labor to Artificial intelligence moreover the bot can navigate in any environment.

The project can be applied and programmed to work in many areas like placing goods from one place to another in warehouses, surveillance system, military applications and combining action for the terrorist affected areas. As this BOT is automated so prearrangement is not necessary therefore it is easy to operate and commercial prospects are very high.

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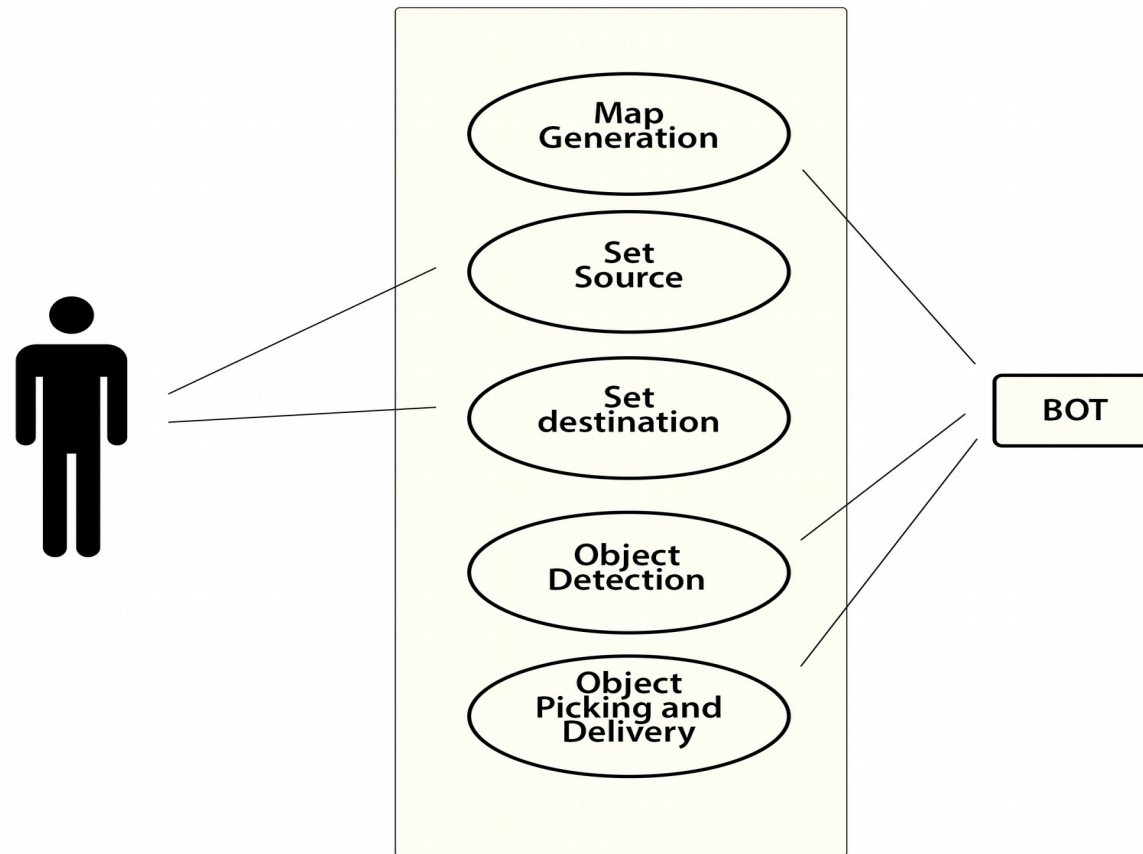
Technology Stack:

This is one of the bots, which has Raspberry Pi on the top portion of the Bot. It is embedded with the ultra sonic distance sensors and laptop, which has a Mapping feature. This low-cost mapping bot emerges with features like live video streaming so that user can stop bot before colliding with obstacles using camera module. After generating a map of the room we can initialize the initial (from where to pick an object) and final coordinate (where to place an object) and starts to move towards destination. We will also be able to detect and see the current coordinates of the moving bot simultaneously on GUI on browser. We will measure the parallel distance from the wall using ultrasonic sensors.

Thus user can keep watch/track the activities and path of the bot.

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Use Case Diagram:



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Dependencies:

- There should be a plane surface for moving bot.
- Environment should be bounded.

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List of Components used	Amount
• Raspberry Pi 3 B+	1
• Motor driver l298n	2
• Omni Wheel Chasis	1
• Servo Motor	1
• DC Motor	3
• Jumper Wires(M-M,F-F,M-F)	40x3
• Orange ICR 18650 2200mAh 22F Lithium-Ion Battery	2
• 10000 mAh Power Bank	1
• Ultrasonic Sensors	2

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Future Scope:

- We will try to move the bot on any surface.
- We will give capacity of lifting heavy goods to the bot.