

## TUTORIAL: MAGNETEER

Build 2 manually controlled bots one to gather and handover the blocks from one side of the portal to the second bot present on the other side which will differentiate them on basis of their magnetic properties.

### Problem Statement:

Team has to make 2 bots capable of holding and picking up cubical blocks to be controlled manually (wired/wireless) by at most 2 members of the team at the same time. Bots must have the ability to move, pick up, hold and transfer the block to other bot through holes of sizes mentioned below. Additionally, second bot must be able to differentiate between a magnetic block and a non-magnetic one and place in places designated for them. Aim of participant is to score maximum possible points to win the task.

### Approach:

- **Preparing mechanical design of bot**

It is advisable to keep the weight distribution over the bots uniform. Also, it's better to keep a counter for extra moment which will be added after lifting up the block

- **Deciding the gripper and holding mechanism**

As said above, lighter it can be, better it is but due importance must be given to the strength of gripper as it is supposed to sustain stress while doing its job.

- **Locomotion of bot**

Bots must be able to perform all possible movements over smooth grounds.

- **Magnetic indicator mechanism**

A magnetic indicator is required on second bot to give operator information

about the block being magnetic / non-magnetic.

## Materials Required:

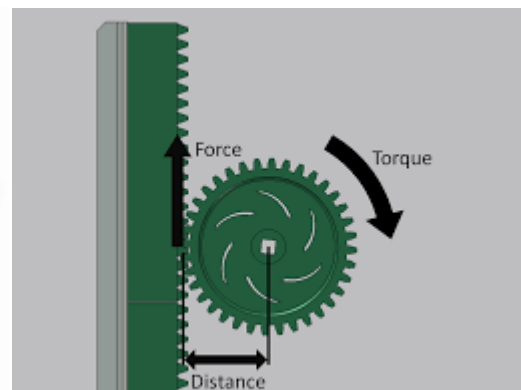
- Chassis (bot base: can be made of wooden board or material strong enough to sustain the load that would be subjected to it)
- Motors (2 for locomotion + 2 or more for gripper / lifting, holding mechanism)
- Gripper mechanism
- DPDT switches
- Batteries
- Magnetic indicator mechanism
- Rack and Pinion (optional)

## Directions of making:

- Make and fix chassis
- Choose gripper mechanism

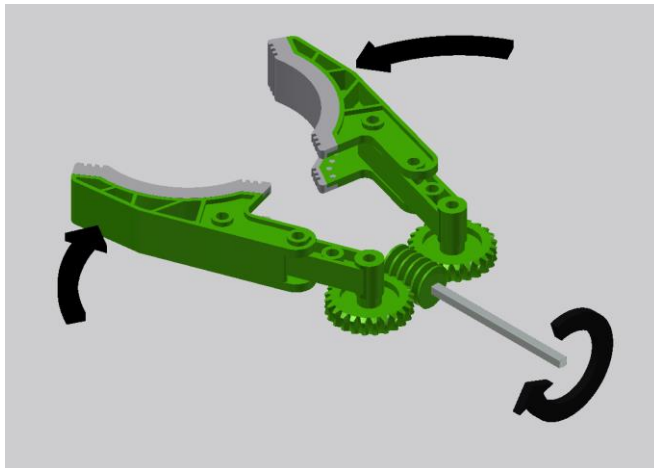
## Mechanism helpful in lifting and holding

### Rack and Pinion



Rotating the motor causes relative motion between the gripper and rotor (motor) thus this relative motion can be used to lift things up and also to move arms which can work as gripper and holding mechanism

### Worm Gear Mechanism:



Motor rotates a cylindrical gear which rotates two other gears which move the arms together or away which can be used to hold and release objects

- **Magnetic indicator:**

Any substance, indicator, switch which can give user information about magnetism of blocks is permissible.

Useful links:

Control Box Circuit : [https://www.robotix.in/tutorial/mechanical/control\\_box/](https://www.robotix.in/tutorial/mechanical/control_box/)