

LOAD SHARING SWARM ROBOTS

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Project Aim

To build swarm of robots where there is a master robot and one or more slave robots following the instructions of the master robot. This technology can also be seen in nature like the flock of birds, colony of bees, school of fishes, etc.

Project description:

The load sharing robots can be programmed to synchronize and take a load from one place to another, these robots can be programmed to adjust themselves to carry the load with equal weight acting on each of the robot. These robots can be used in industries for carrying the products to the storage facility, or in the construction field, in super markets, in mining, and many more areas where there is requirement to carry load.

Hardware Used:

- **Arduino Uno:** Arduino Uno is a Microcontroller based on Atmega328. It has 14 digital input/output pins and in which 6 of them can be used as PWM outputs, it also has 6 analog I/O pins, and a USB connection, a 16MHz ceramic resonator, a power jack, an ISP header and a reset button.
- **RF 433 MHz Transmitter module:** This module has an encoder which helps in converting the data from parallel to serial communication data format and this data is then transmitted using radio frequency.
- **RF 433 MHz Receiver module:** This module has a decoder in it and the received data is decoded so that Arduino can understand the data received.
- **L293D Motor Driver:** You need motor drivers to drive the motors, as the microcontroller only works on 5V, it can only give signals to the motor but the motor needs more than 5V to run this is why we use motor drivers.
- **DC motors:** Use DC motors to actuate the robots.
- **Robot Chassis:** Use strong chassis which can hold some serious weight, you will need one chassis for master and one for each slave.

Software Used:

- **Arduino IDE Version 1.8.5** : You will be needing Arduino IDE software for writing and uploading the program into the Arduino Uno board.

Approach

1. Build strong robot chassis for all the robots, the robots should be able to hold any load placed on them, and the center of balance of the robot should be in the center and as low as possible.
2. Build a remote control for controlling the robots, this remote controller will be having a transmitter module and sends data to all the robots.
3. Here the master is the user and all the robots are slaves, the command sent by the master through the Radio controller is received by all the slave robots. Program the robots such that they follow the commands given by the master.