



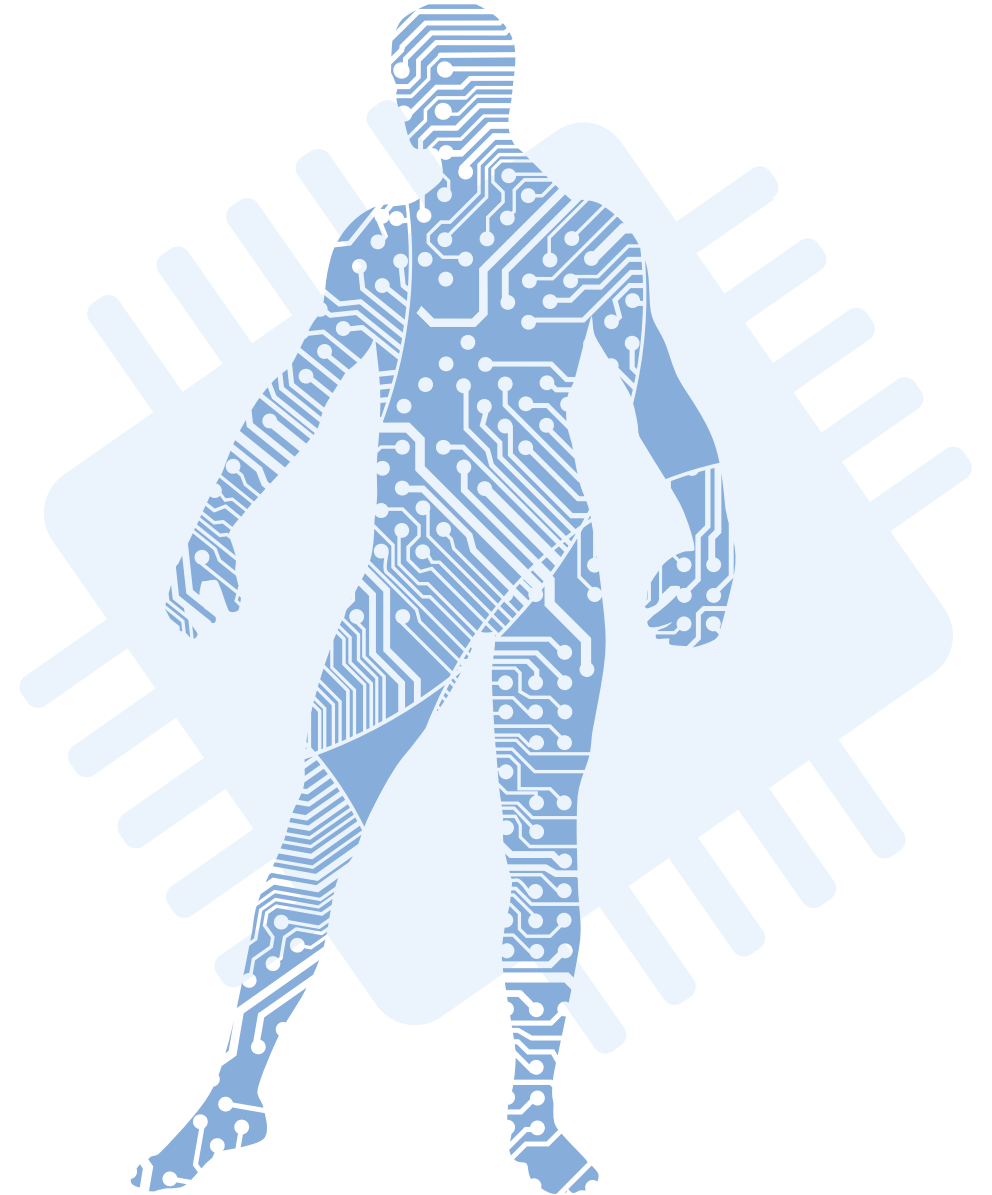
AUTOMATIC CARGO HANDLER

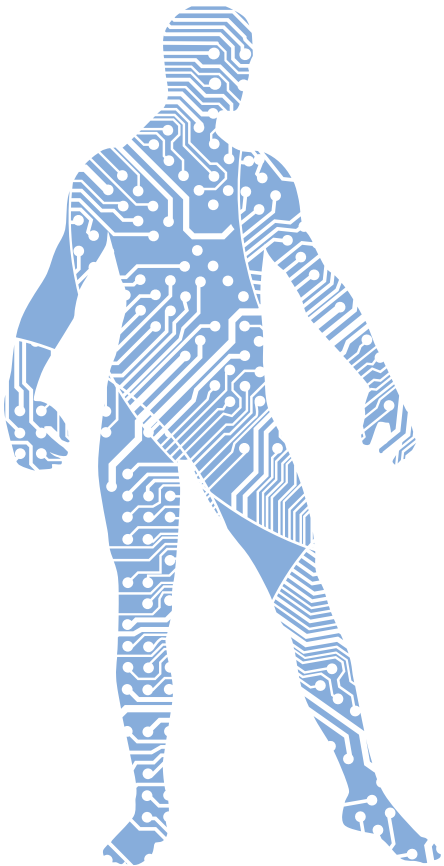
Task Accomplished by :

Mazouzi abdessatar

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Designing an automatic system with artificial intelligence has been the most interest point for the engineers in the recent times.

Our project is a prototype of automatic system , by making the process automated completely , In order to do that, the identification of the cargo and arrangement of orders can be done by using the image processing technique .

1. Arduino MEGA 2560

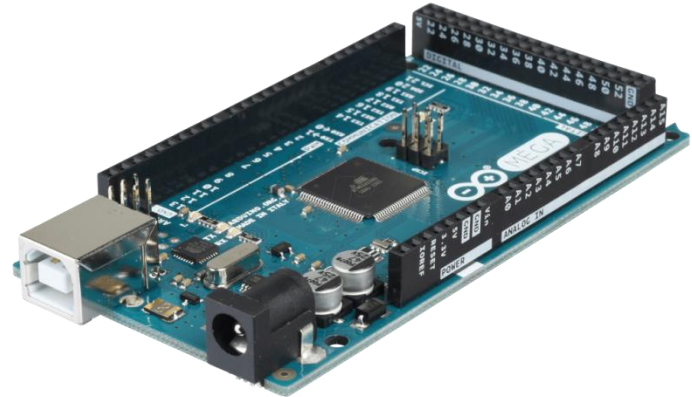


Fig 01 :Arduino MEGA 2560



This board used as the Central Processing Unit (CPU) of the robot

2- Arduino Uno:

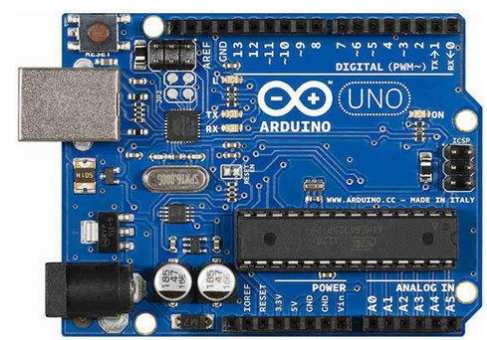
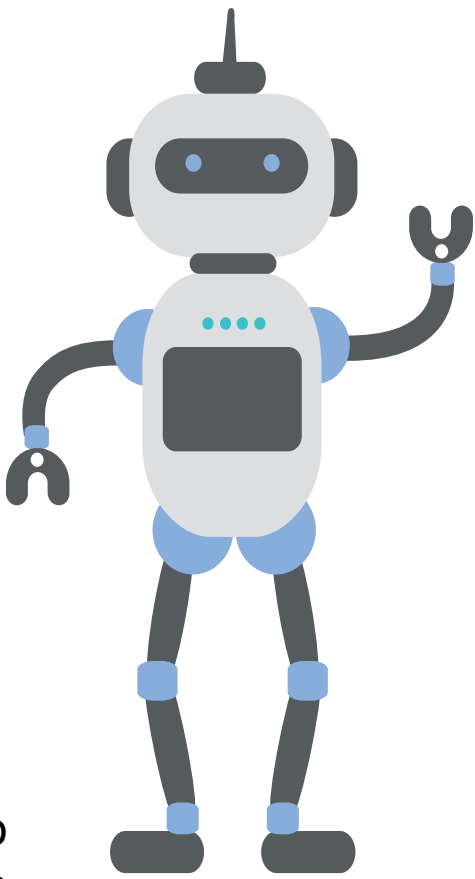


Fig 02 :Arduino Uno



We used a Arduino Uno connected to the PC to transmit the serial data from the Matlab to the Bot using RF module.



3. RF Module:

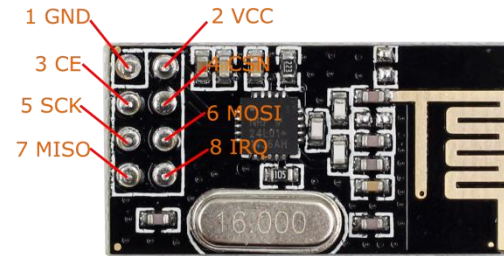
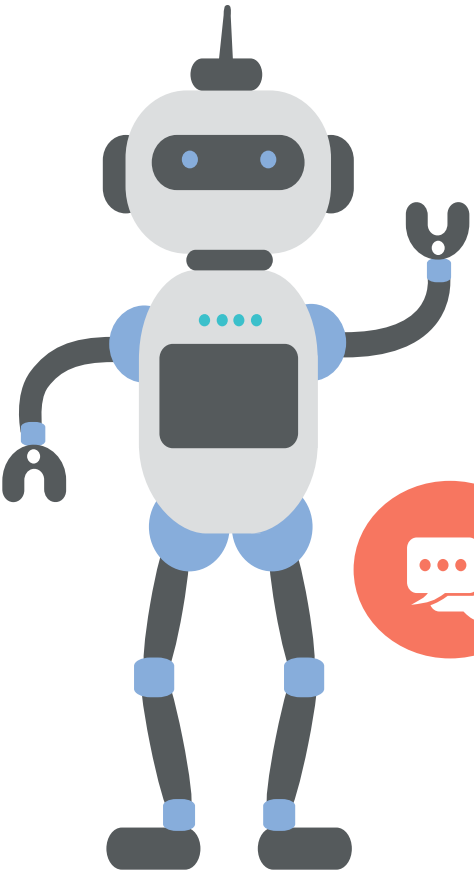


Fig 03 :nRF24L01 module

nRF24L01, The RF module with a range about 30-200 m to transmit the image processing serial data from computer to the Arduino board via radio communication..

4.Sharp IR Distance Sensor :



Fig 08 : Sharp IR proximity sensor



To find the distance from the cargo and the drop zone, we used Sharp IR proximity sensor which gives a better approximation for low distance objects.

5. Motor Driver Shield:

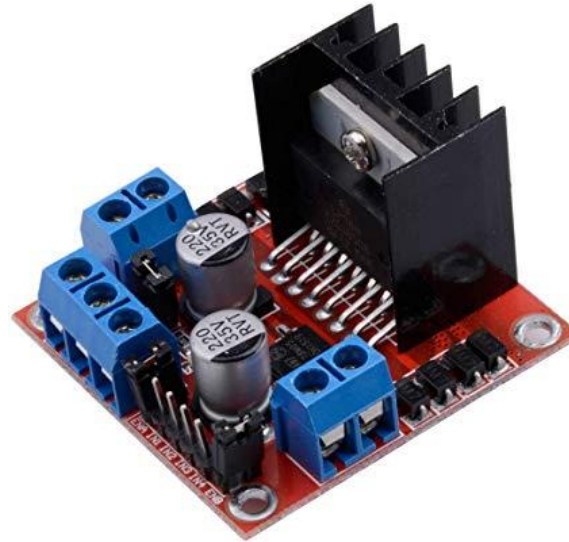


Fig 04 :Motor driver

motor driver shield was used to run the wheels of the robot.

6. Power Supply:

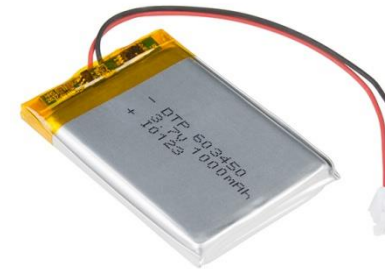


Fig 05 : lithium batteries

The main supply was split into two parts. One is for the CPU, communication and motors, where another was for the robotic hand.

7. DC Motor



Fig 06 : DC motor

We have used two DC motor for the wheels of the robot. The motors needs 6-12 volt and required good constant voltage and current.

8.Servo Motor:



Fig 07 : servo motors

Two Servo Motor was used in the robot to precisely control the hand in vertical and horizontal motion.

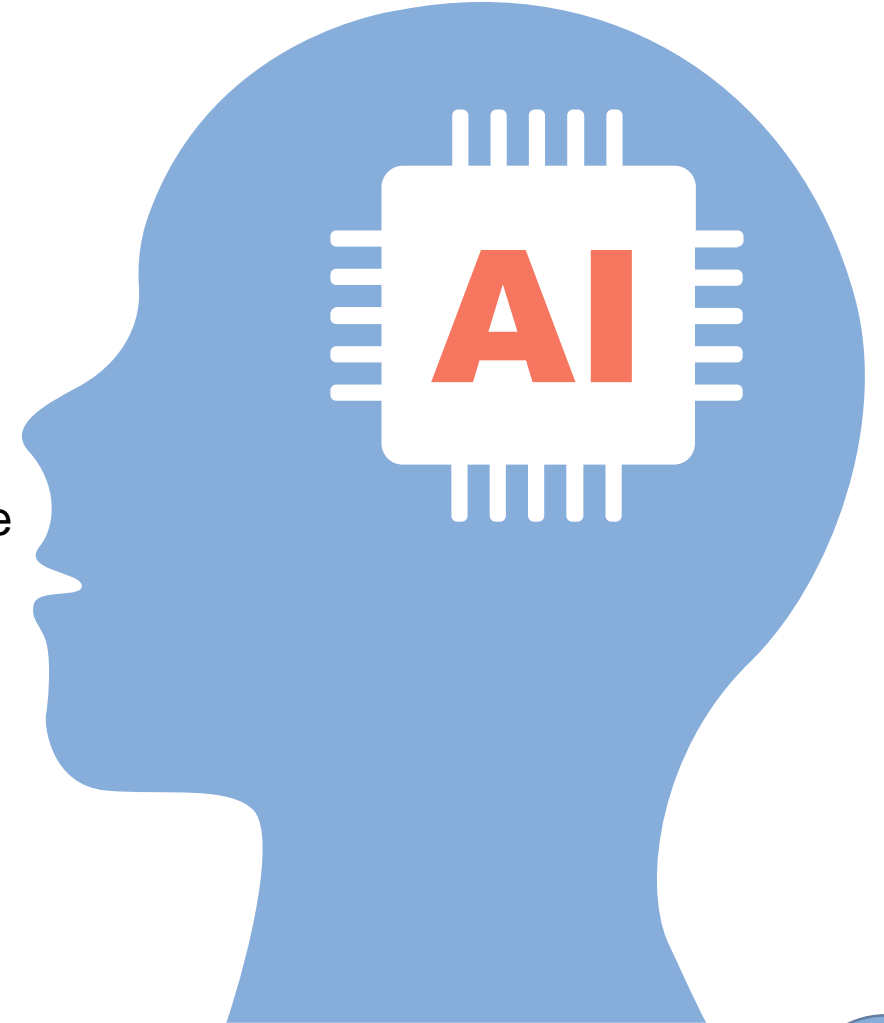
AI 3-Working Principle

3.1 Video Acquisition Through Cellphone camera:

The automatic cargo handler robot has the vision with the help of camera. In order to make the project less costly .

3.2 Transmitting video stream through Wi-Fi:

The video taken by the camera is needs to be transmeted to the PC for image processing. In order to do that, we used the free software IP CAM in the android mobile. It enables to transmit the video stream over the Wi-Fi router.



3.4 Image Processing by Matlab:

This is the main part of the robot. In Matlab, the whole image processing has been done. The task can be segmented into several portions:

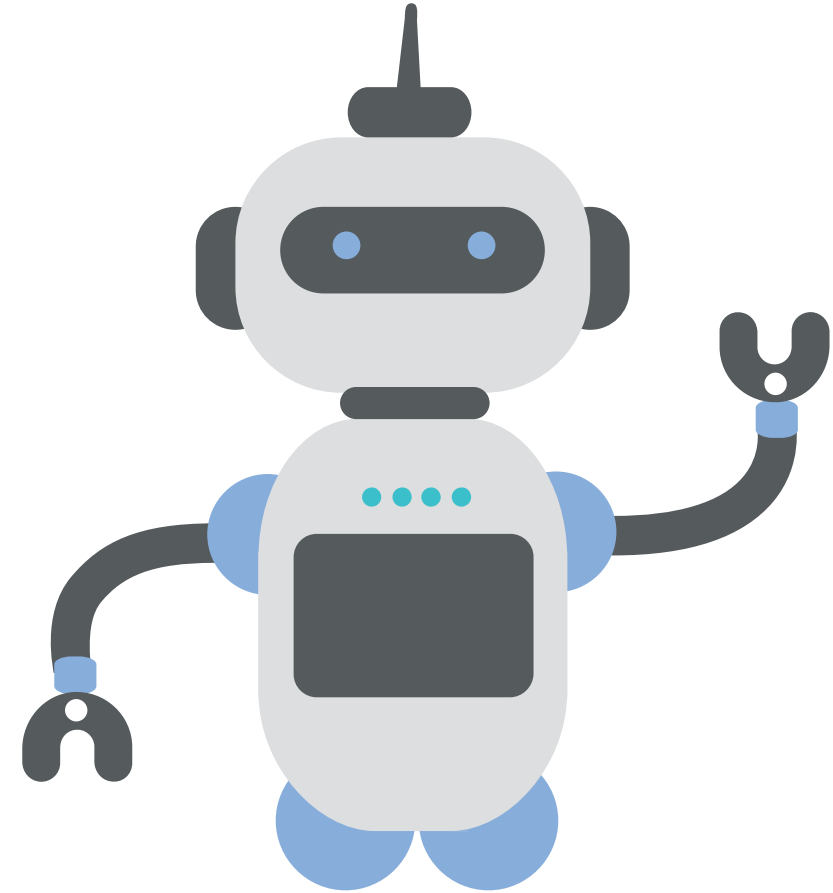
- Filtering .
- Image processing and color identification.
- Location finding and decision making .
- Serial Data Sending:

3.5 Sending Command from MATLAB to the BOT Using RF module

In order to send the command from the MATLAB to the robot, RF module(nRF24L01) was used. It is a pair One is connected to the Arduino Uno, which receives the Matlab serial data to it. the other one is connected to the Arduino MEGA 2560 in the robot that receives the serial data over this radio communication .

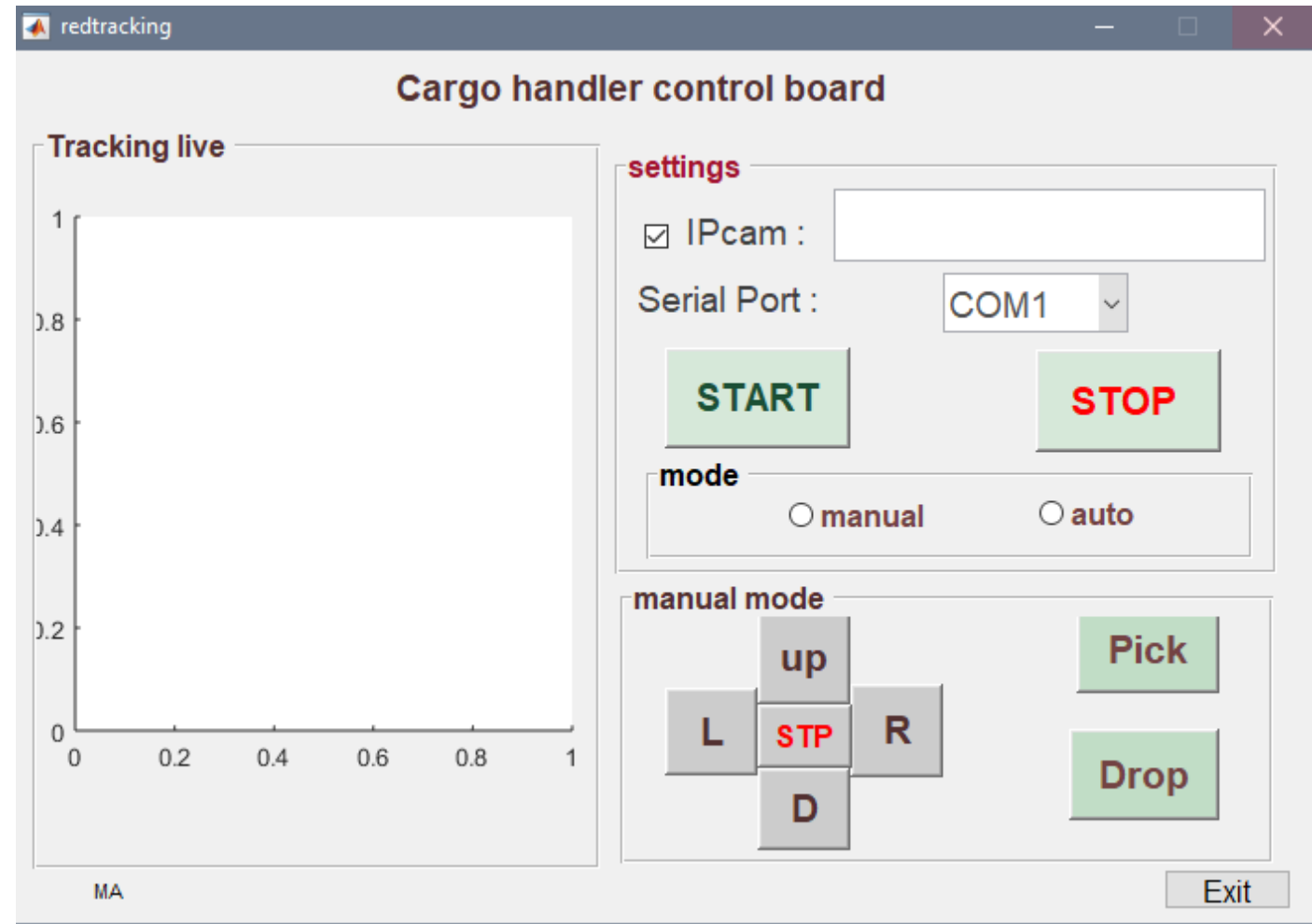
3.6 The Bot executes the command

The robot receives the data via RF module . From this data the bot can execute different types of command to move front, back, stop, left, right and so on.



A 04 MATLAB GUI

we have developed a user interface (GUI) that provide several option wich helps users to control the bot manually or a automaticly .



05 Conclusion

Our project gives practical experience of control system by dealing with the combination of image processing signal data and corresponding task performed by the machines.

it can be developed as shape detection with it too. Also, it can be a line follower. We haven't developed it that far, but the limitation of time forced us to limit it up to this point.





Thank You