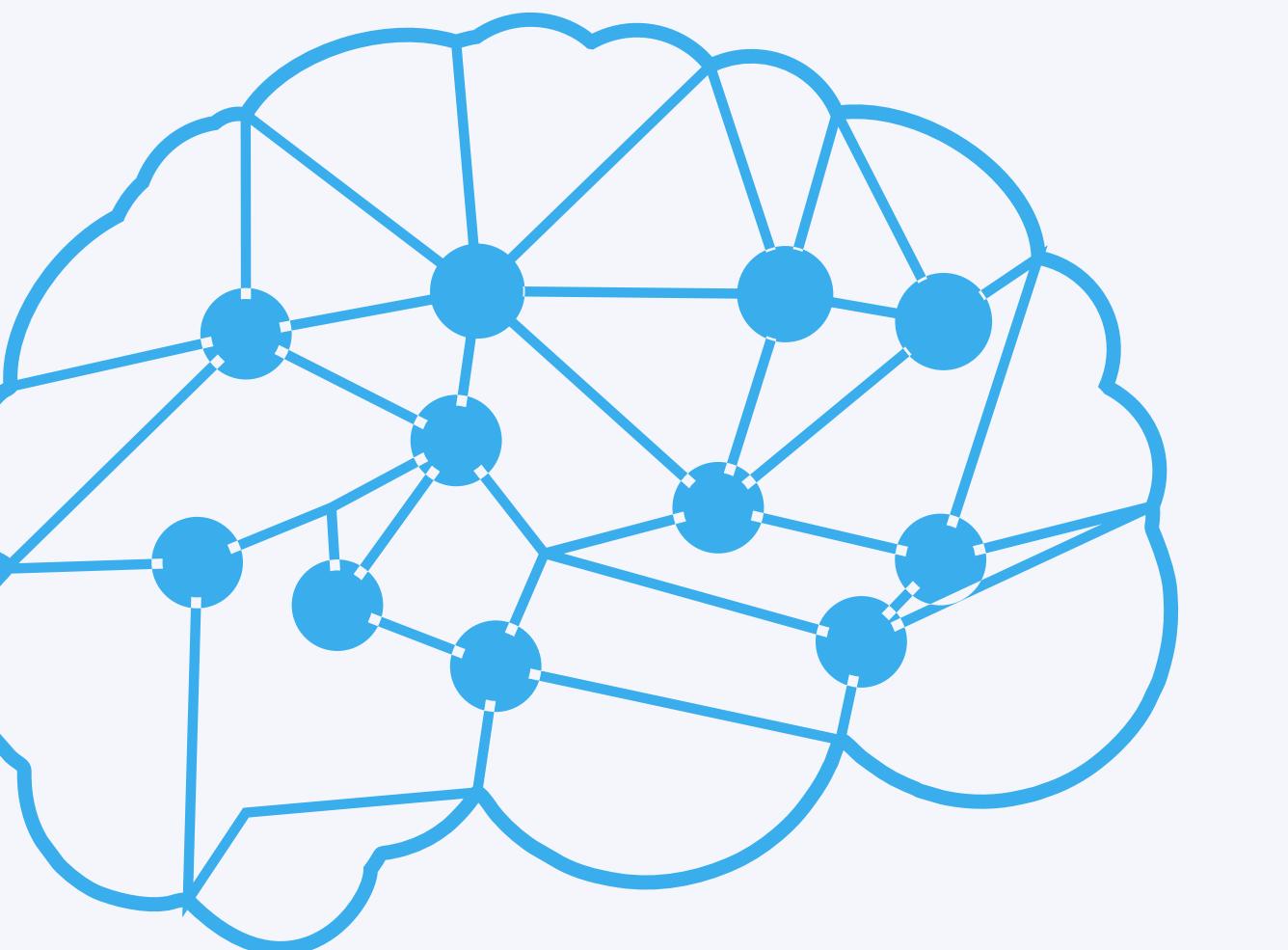
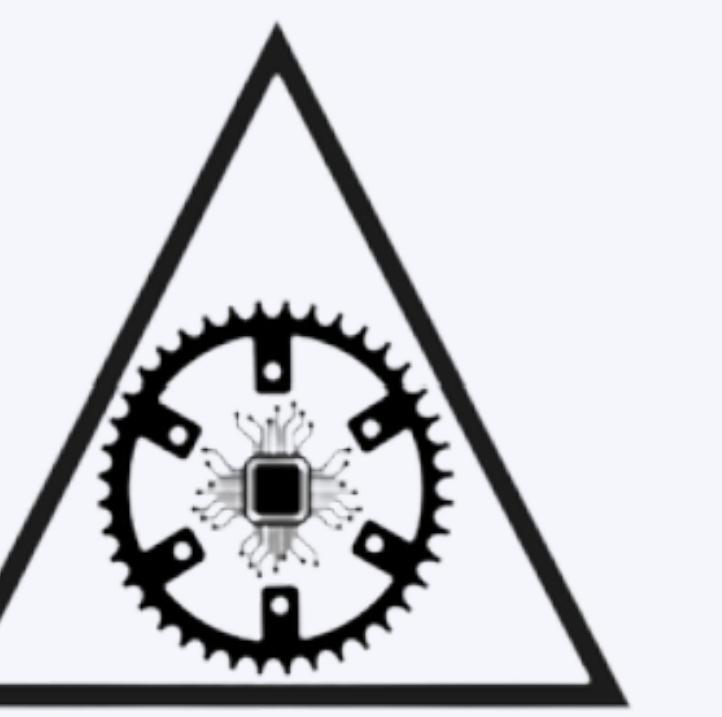


ARTIFICIAL HARVESTER

**Robotics in
Agriculture**

Team: Enots43

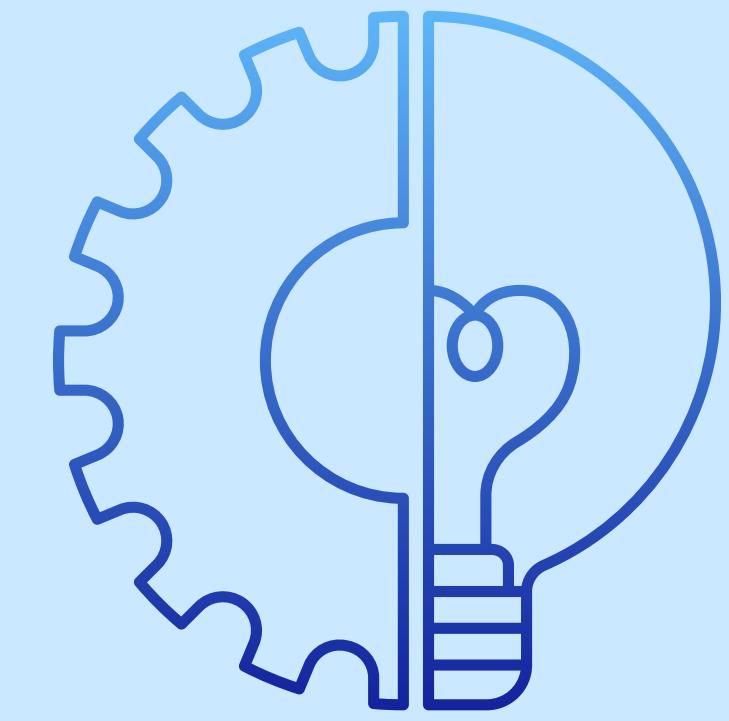
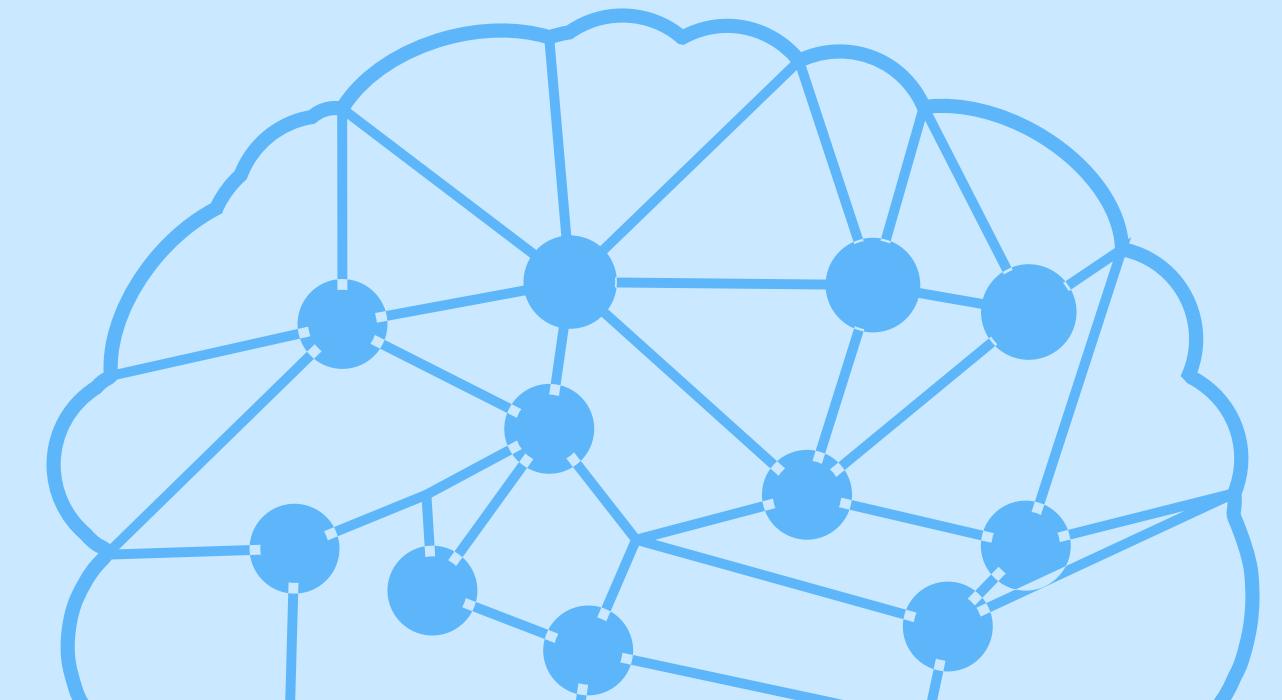


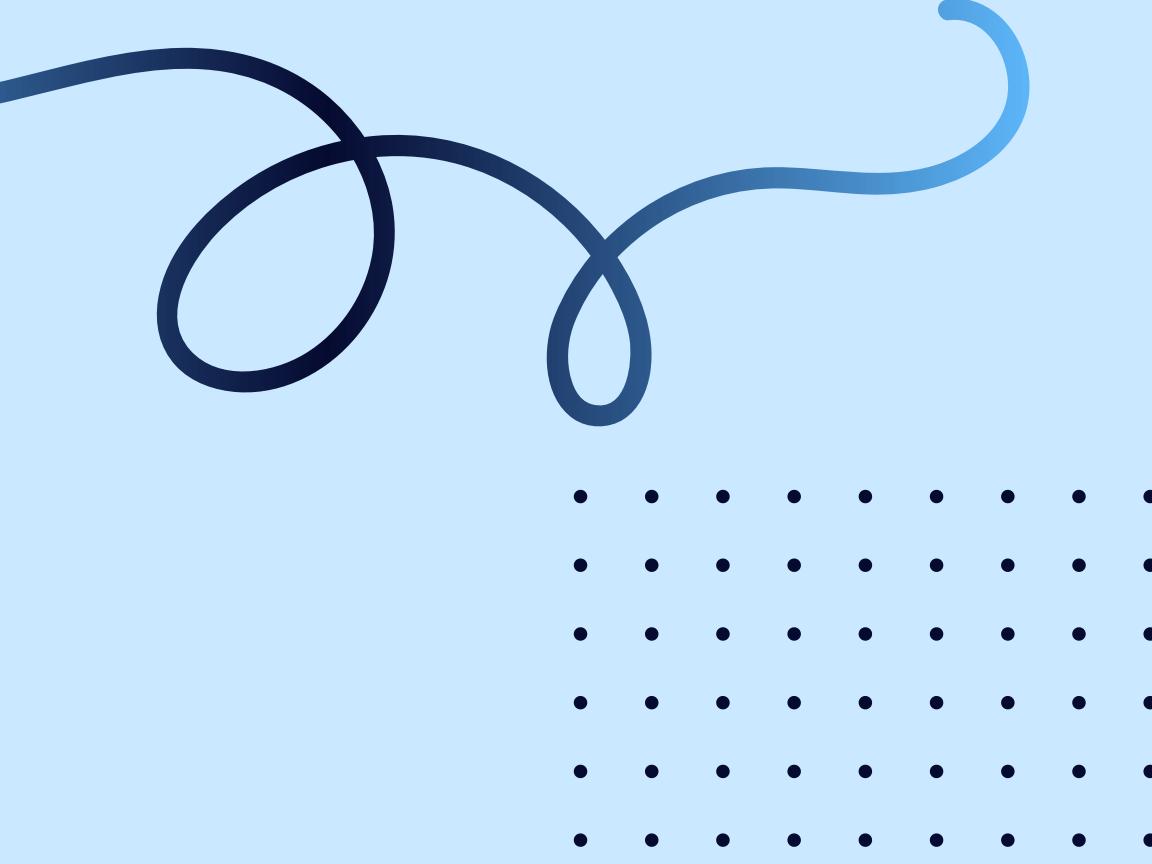
TEAM: Enots43

Members:-

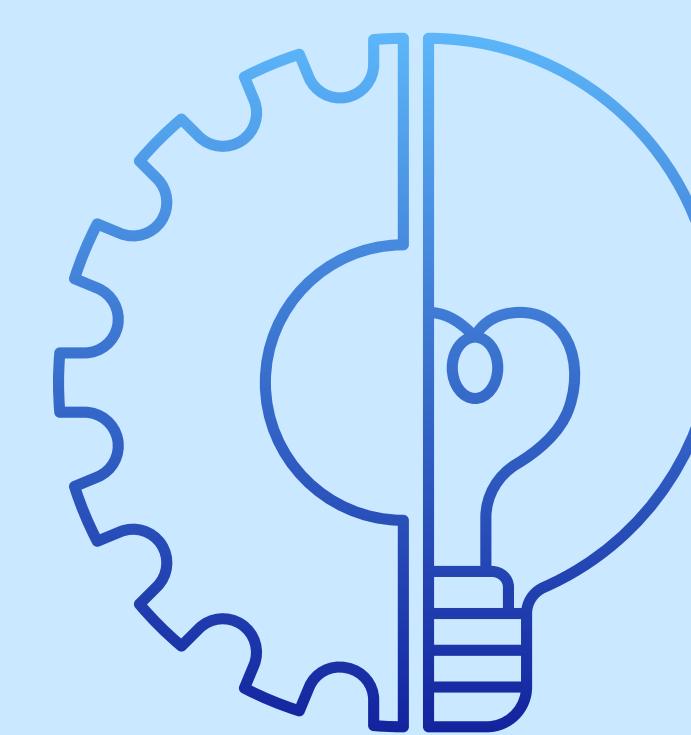
1 Ritesh Kumar Maurya
20210014

2 Muskaan Mehrotra
20210006





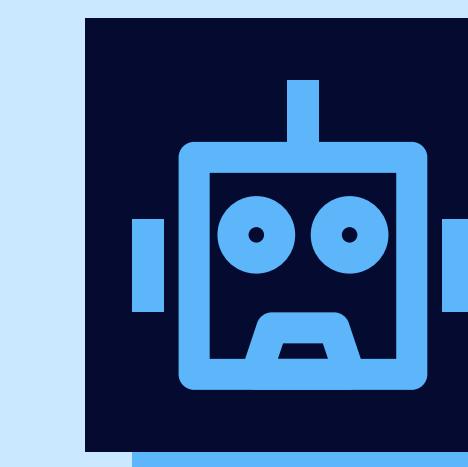
ARTIFICIAL HARVESTER



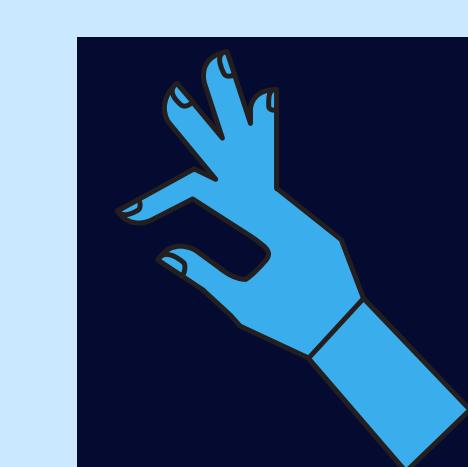
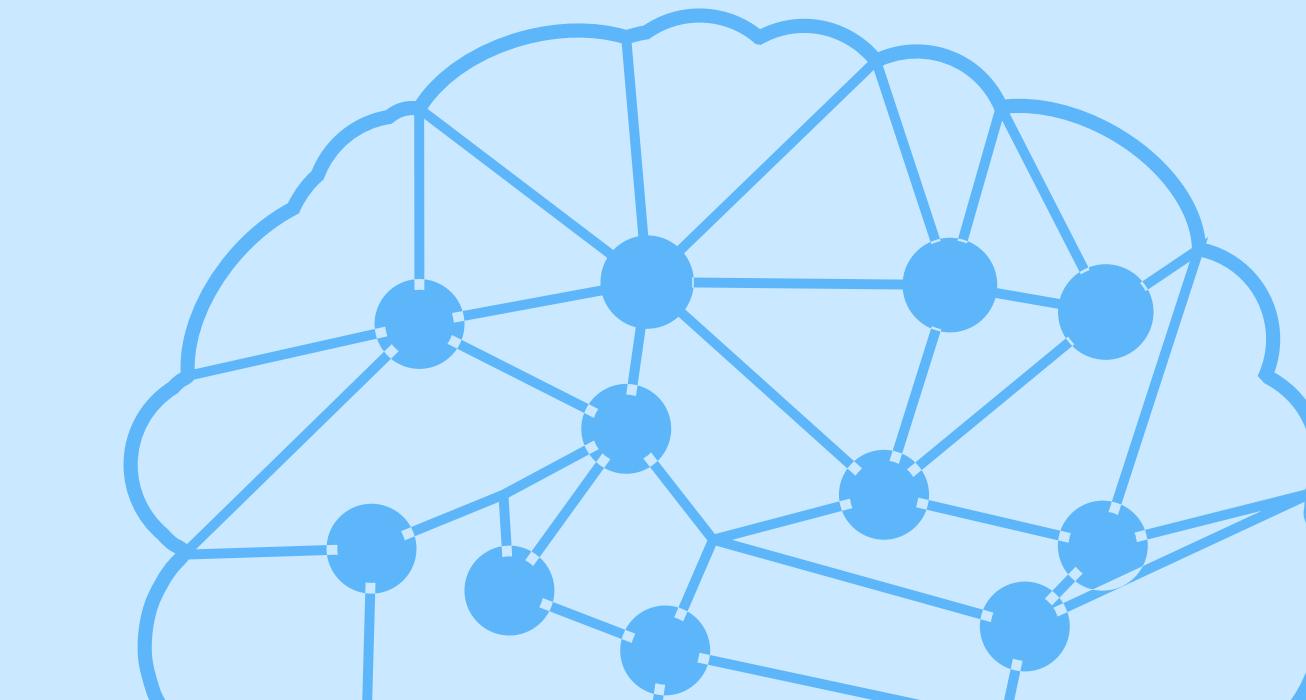
A robotic system that has the ability to analyze the ripening level of fruits and vegetables and can pick them using this analysis.



Computer Vision to detect the color and size of the given vegetable.

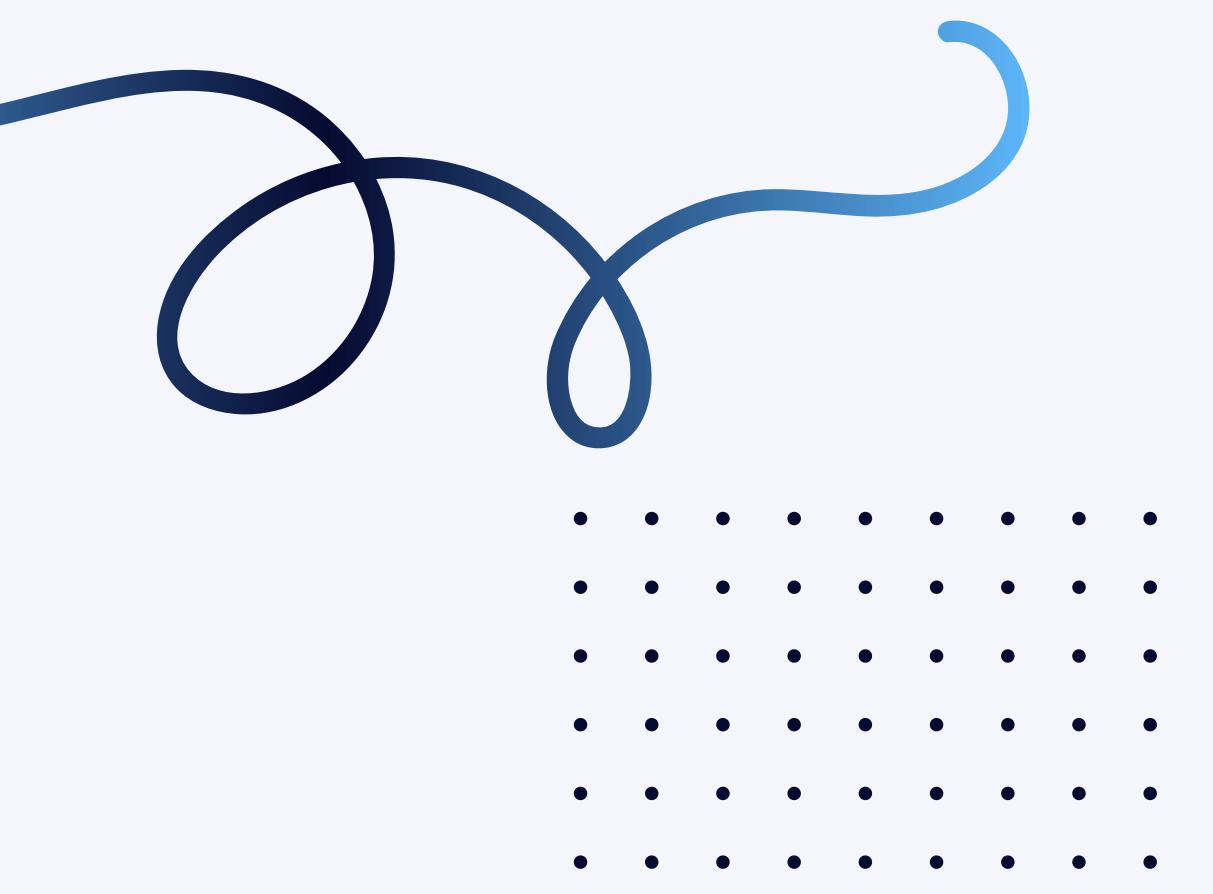
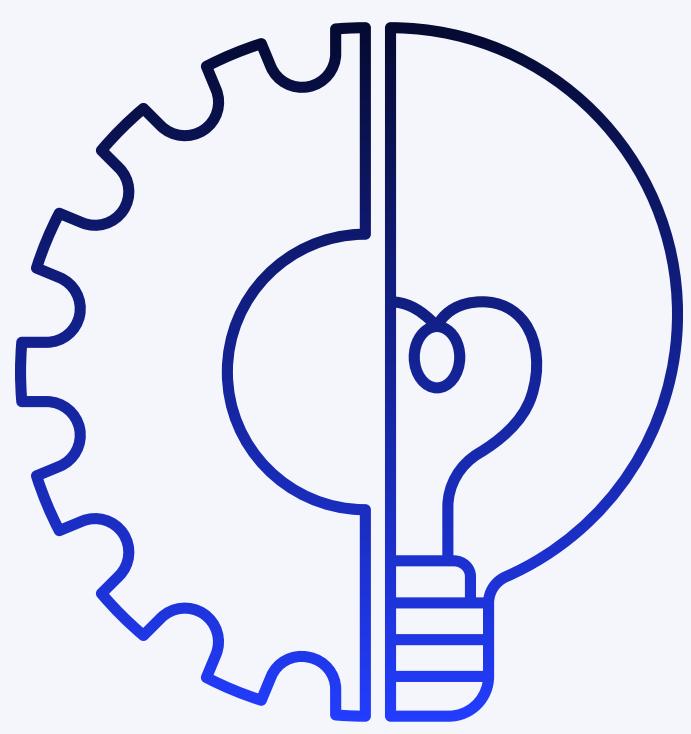
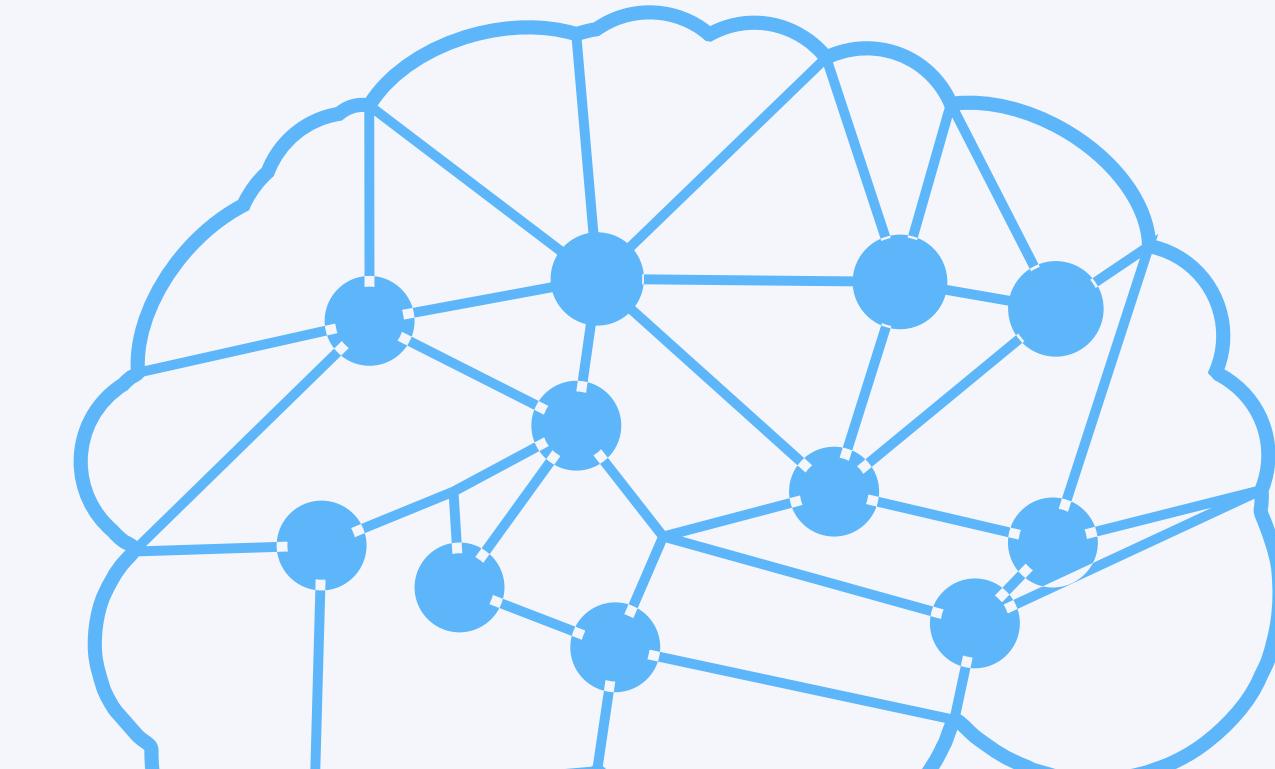
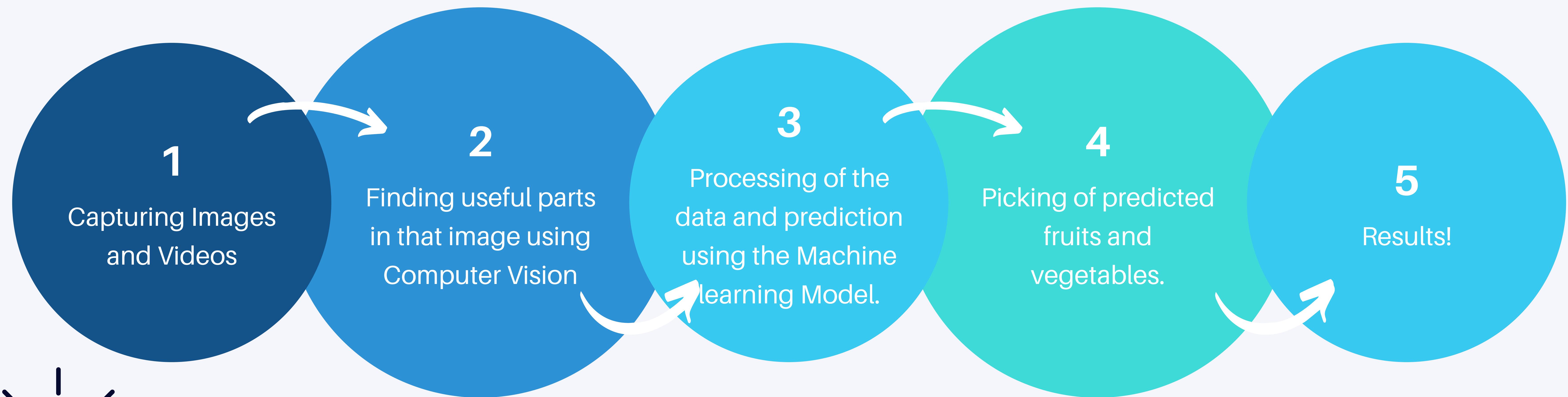


Analysis of the features using Machine Learning Model



Picking of crops based on these analyses.

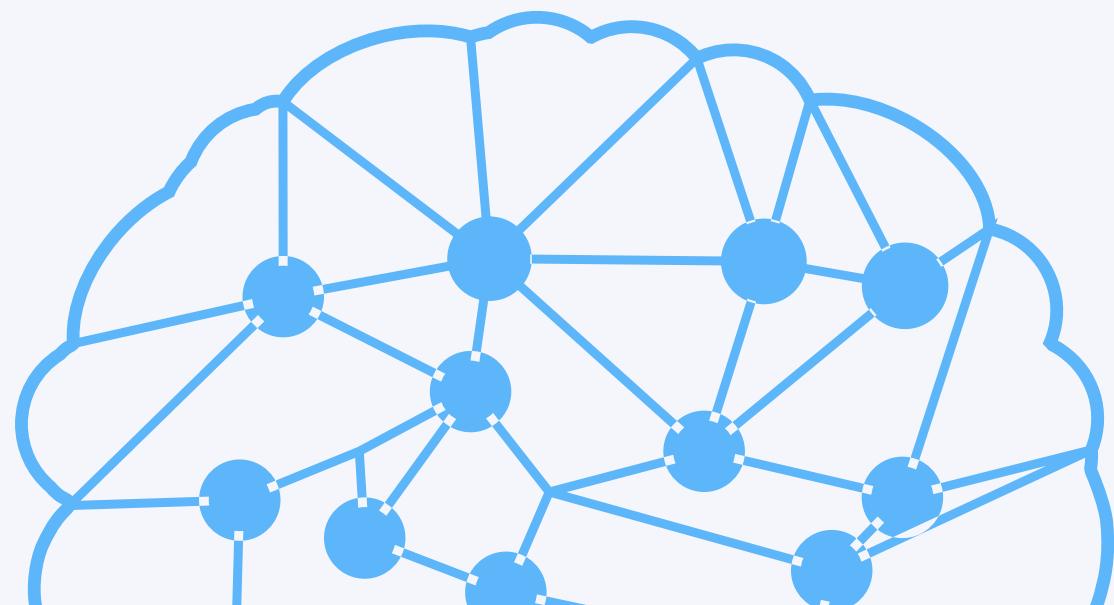
Algorithm



Computer Vision Implementation

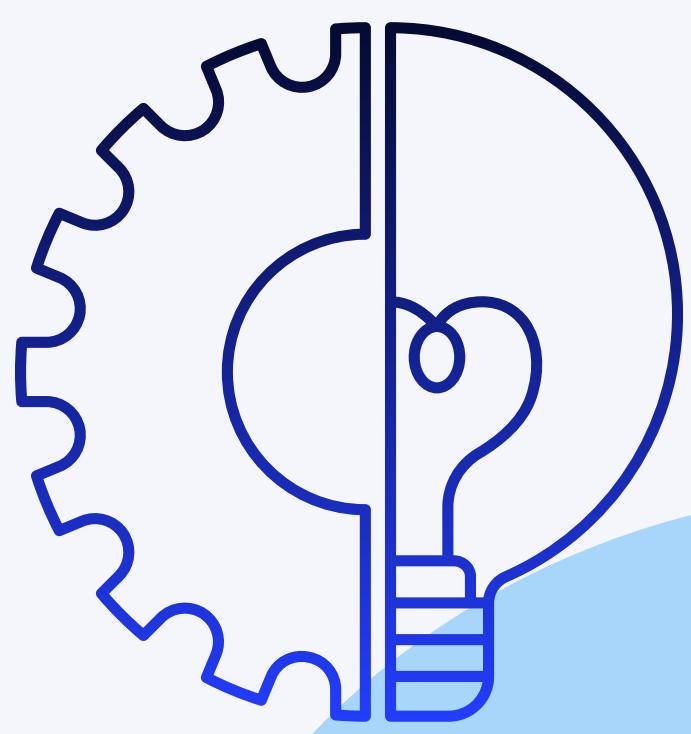
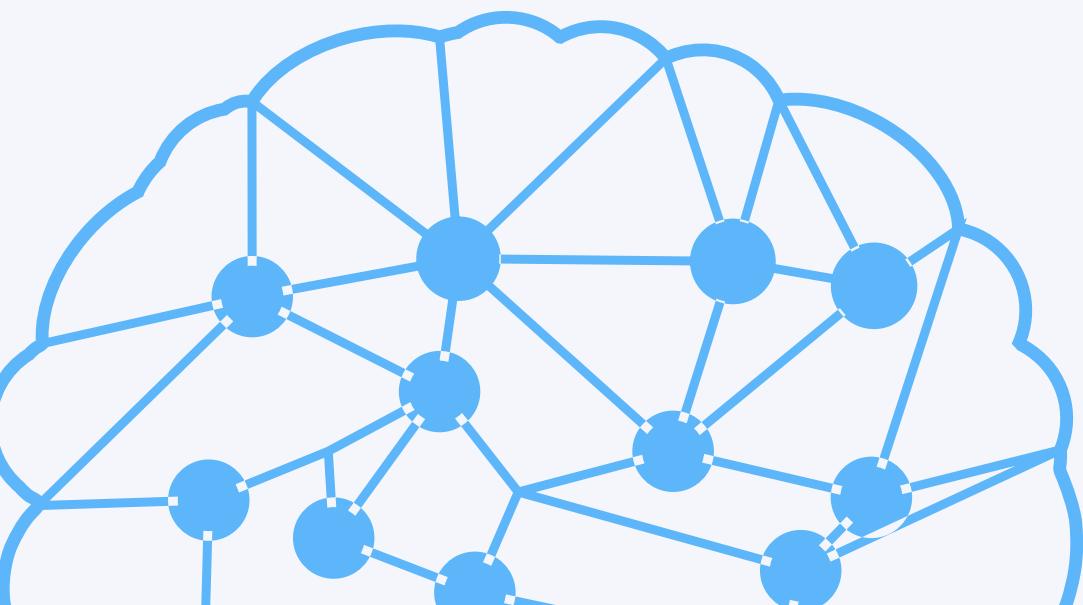
The robot will capture and store images which will then be resized and converted to RGB using OpenCV in the Python programming language.

CAN I
HELP
YOU?



Machine Learning Implementation

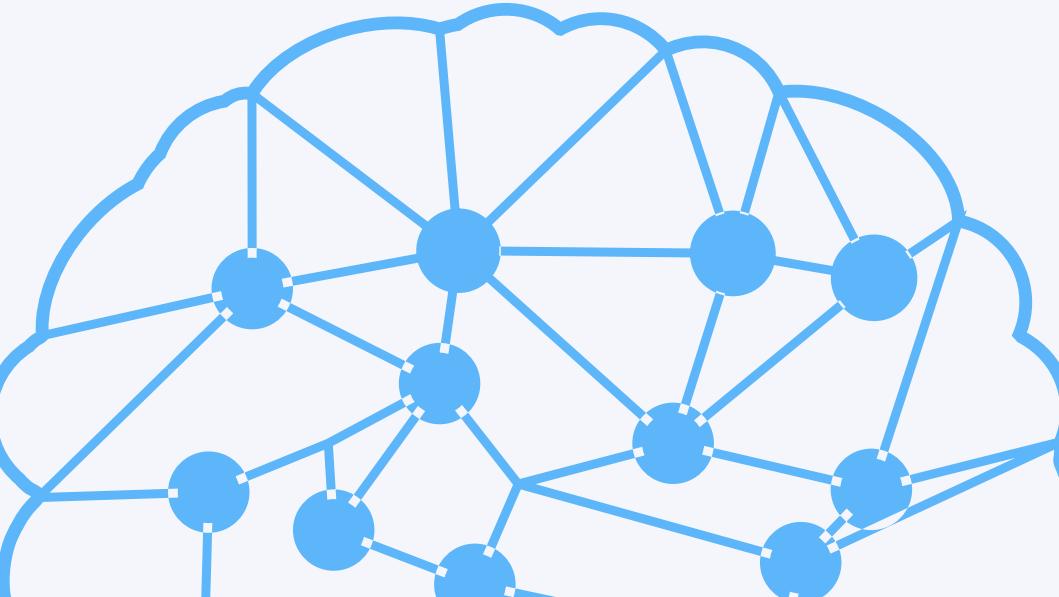
- Using Transfer Learning to classify images in categories like:
- Initial Stage(Not Ripe), Middle Stage(Not Ripe) and Final Stage(Ripe).
- The class with the highest prediction rate will be fed to the robot.



Design of Robotic Arm

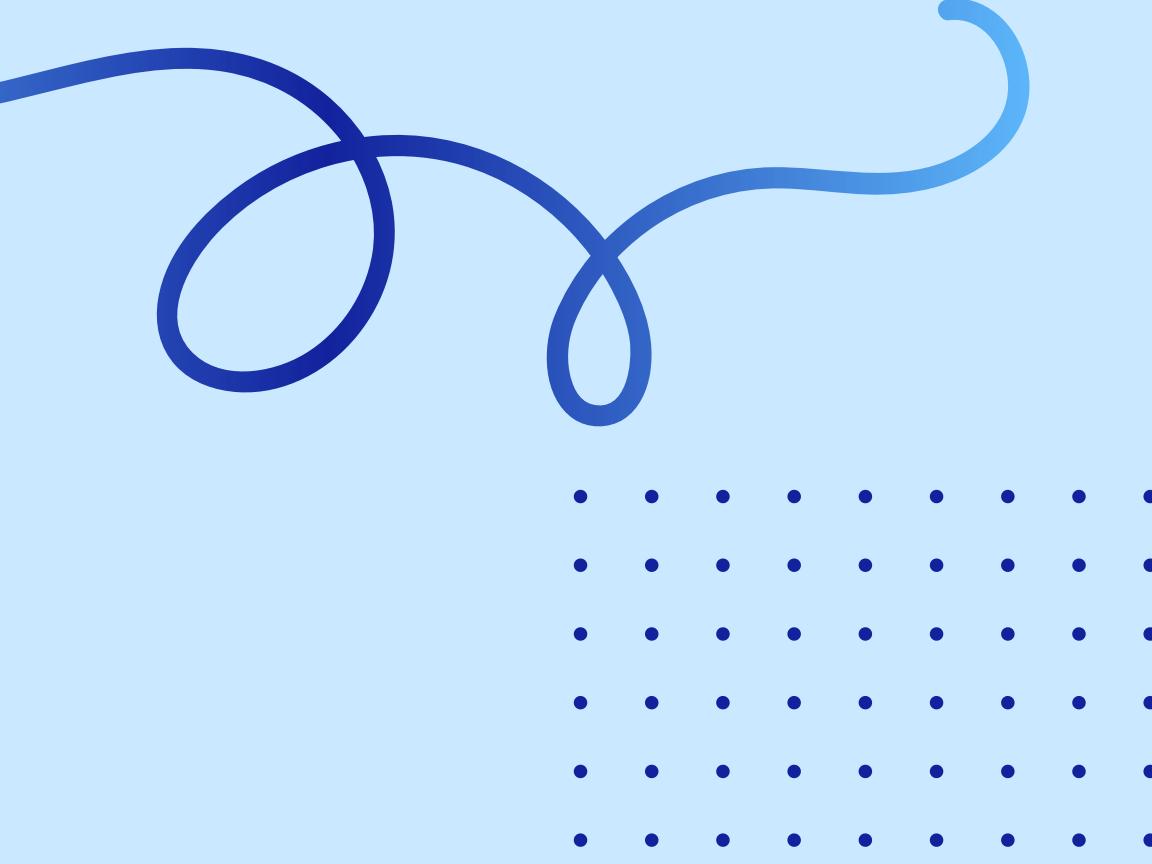
works on the principle of interfacing servos and potentiometers.

The remote is fitted with potentiometers and the servos are attached to the body of the robotic arm. The potentiometer converts mechanical motion into electrical motion.

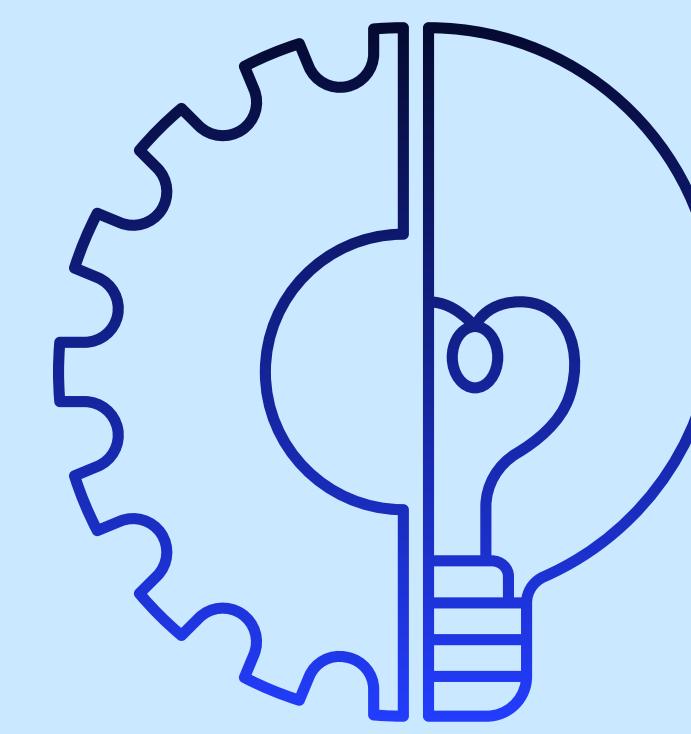
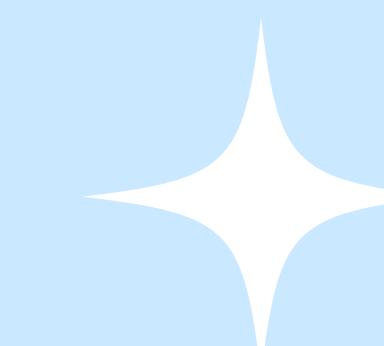


Concept of robot arm

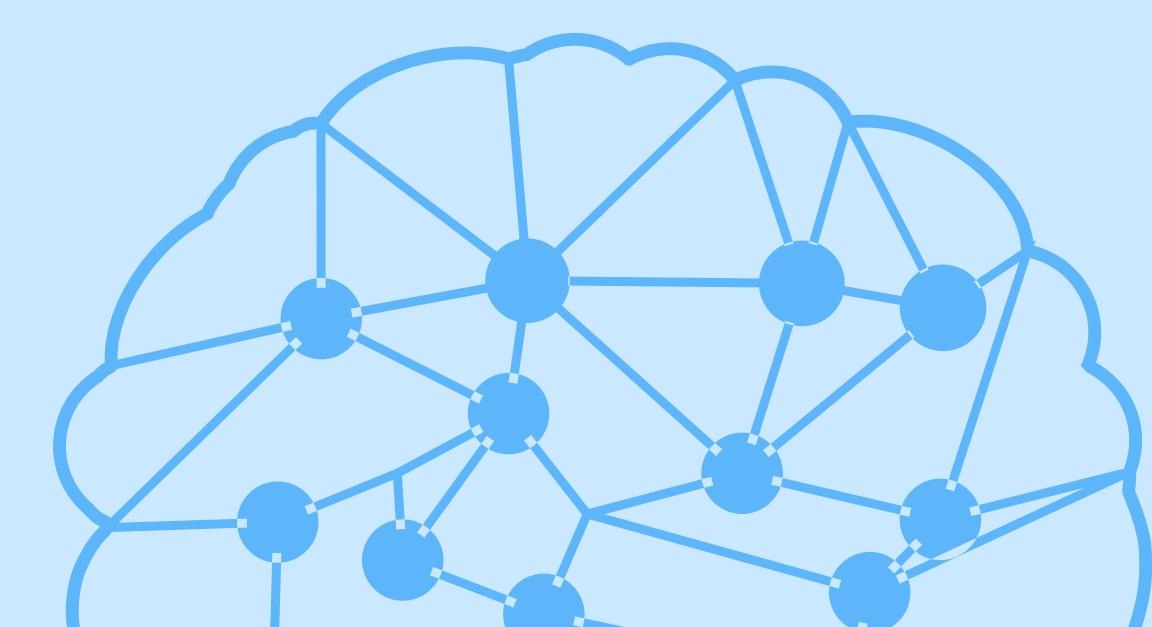
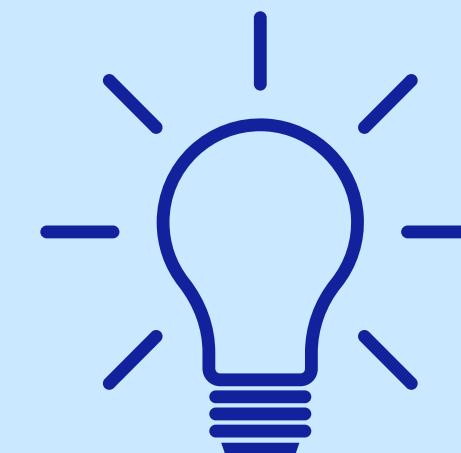
- It comprises of 3 parts namely -elbow ,joints and the ends(fingers)
- Fingers are the most complex part. (**END EFFECTOR SELECTION**)



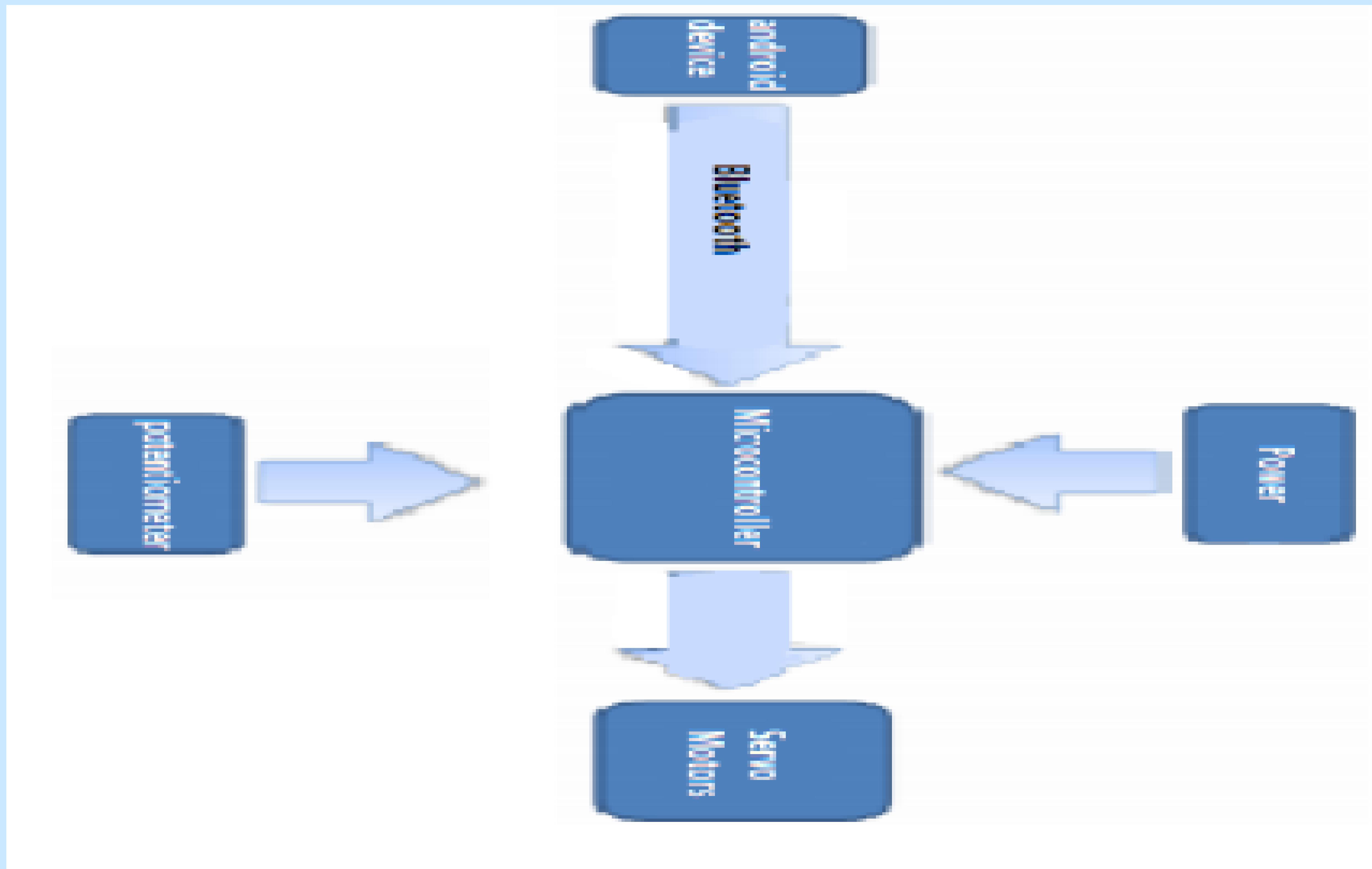
Elbow



- It consists of basically 3 Parts -the microcontroller, the driver and a computer based interface
- The microcontroller used is ATMEGA 328p. Which comes with the development board Aurodino
- The driver used is an eight channel servo controller board. It supports two control methods: Bluetooth for direct connection to an android device or direct control using variable resistors.

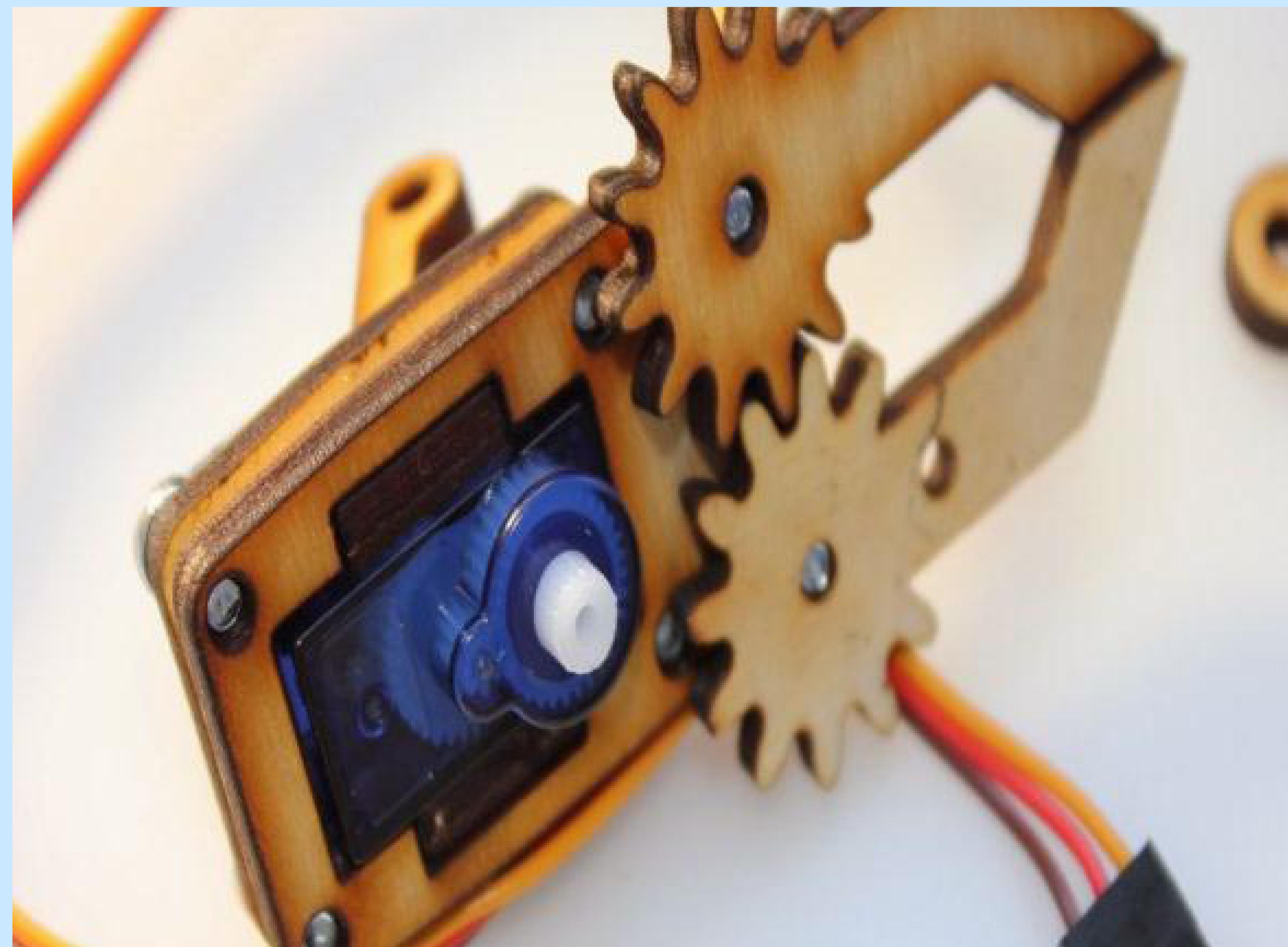


It supports tow control methods: Bluetooth for direct connection to an android device or direct control using variable resistors



Electronic scheme of control

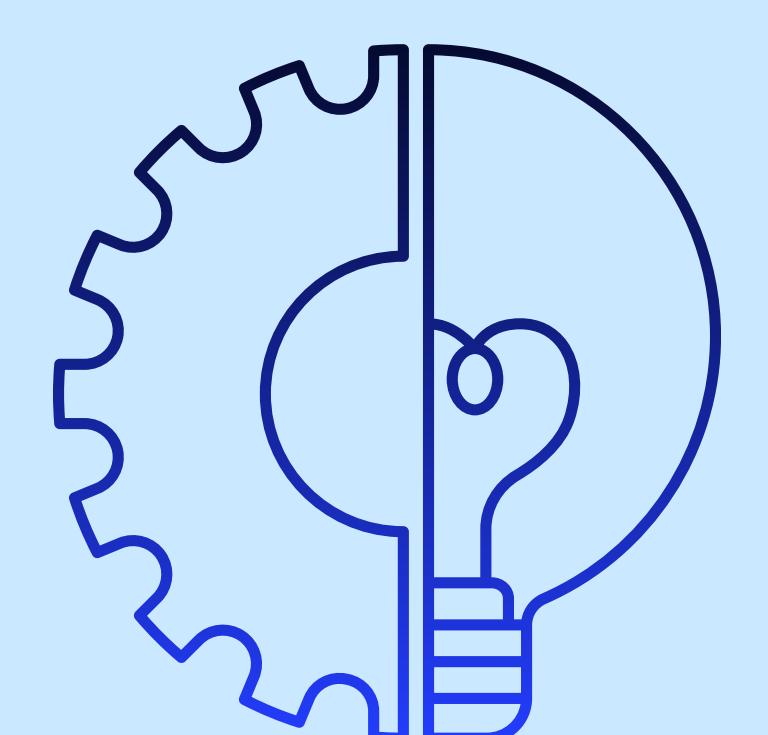
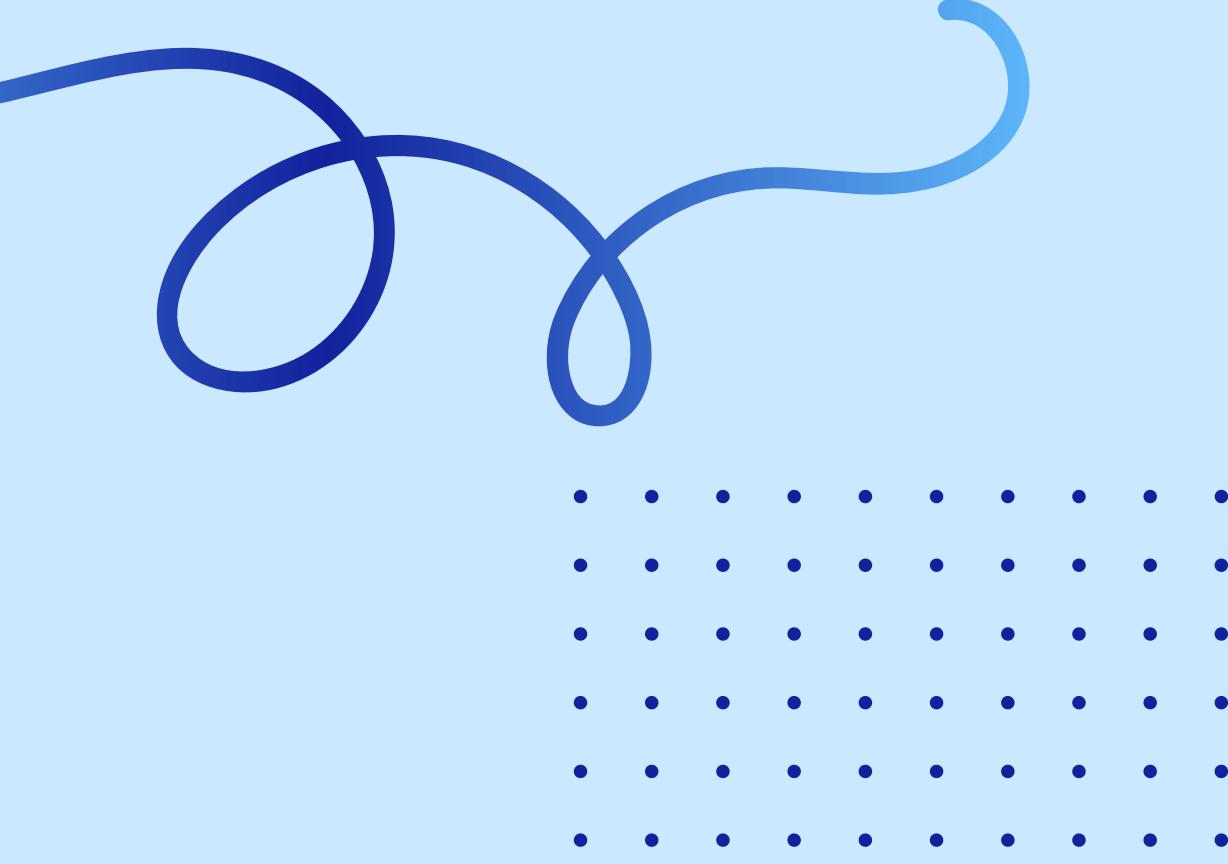
End effector selection



End effector selection

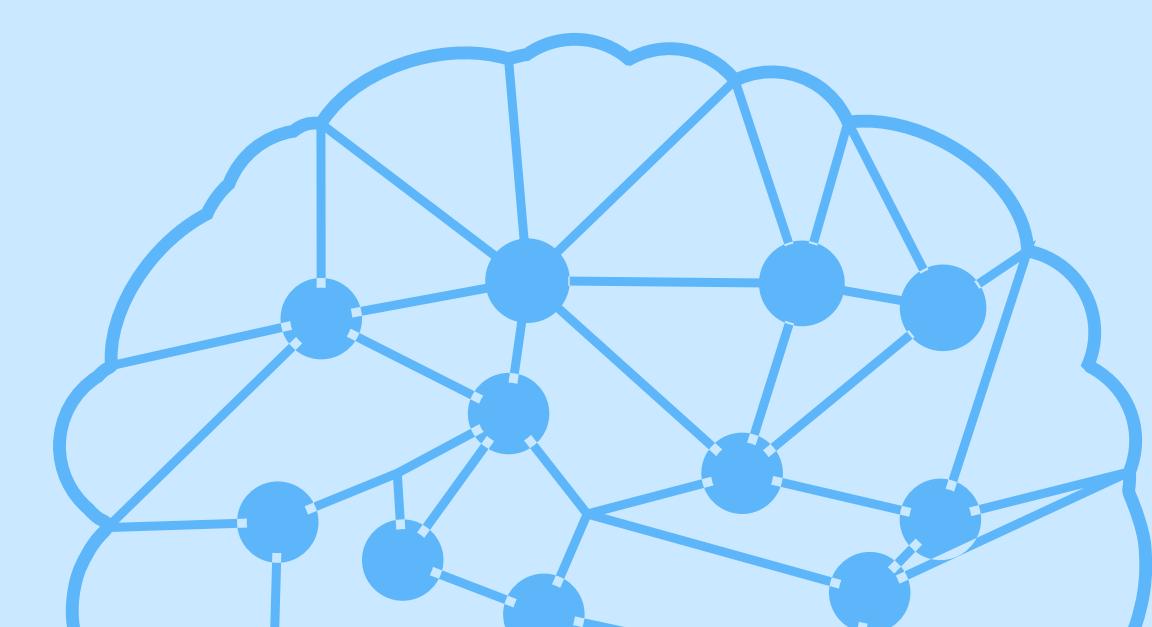
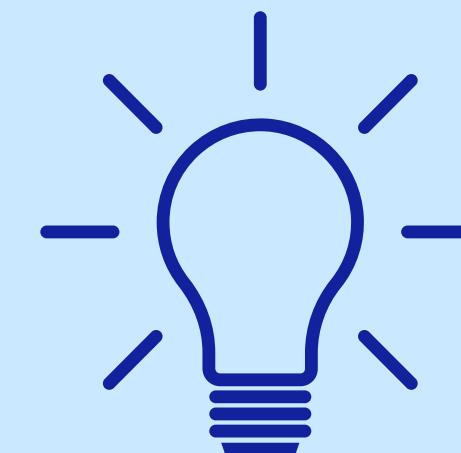
The robot arm accomplishes for; it can be pneumatic, electric or hydraulic. Since our robot arm is based on an electric system, we may choose electric basis of end effector.

Please note that the end effector is controlled by a servo motor .



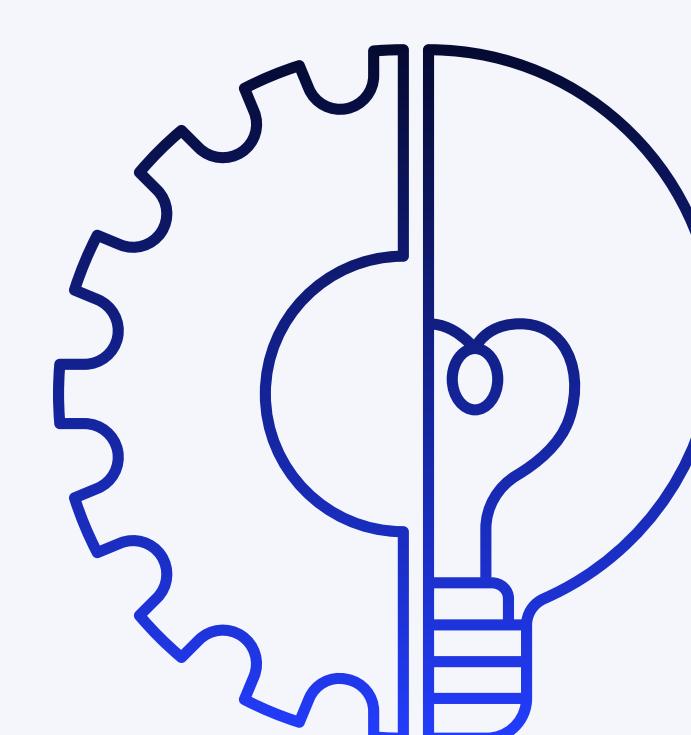
Robotics to pick ripe vegetables

- Using the data from ML
- The robot will pick the ripe material from the plant
- It can be stored in a container

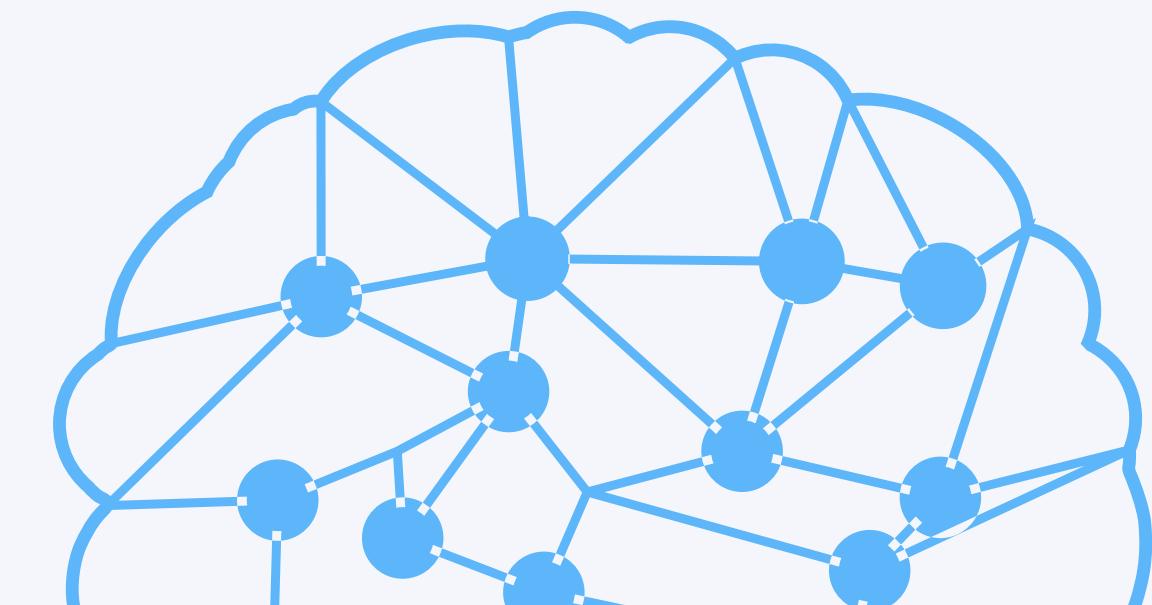
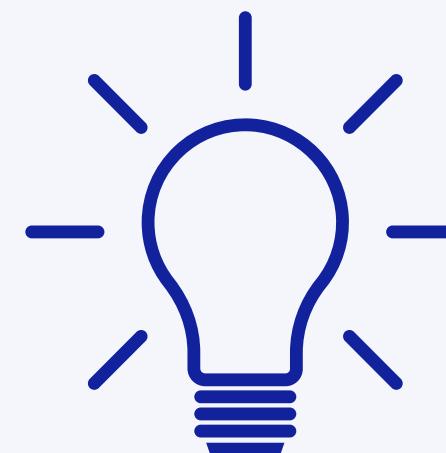




Data Augmentation

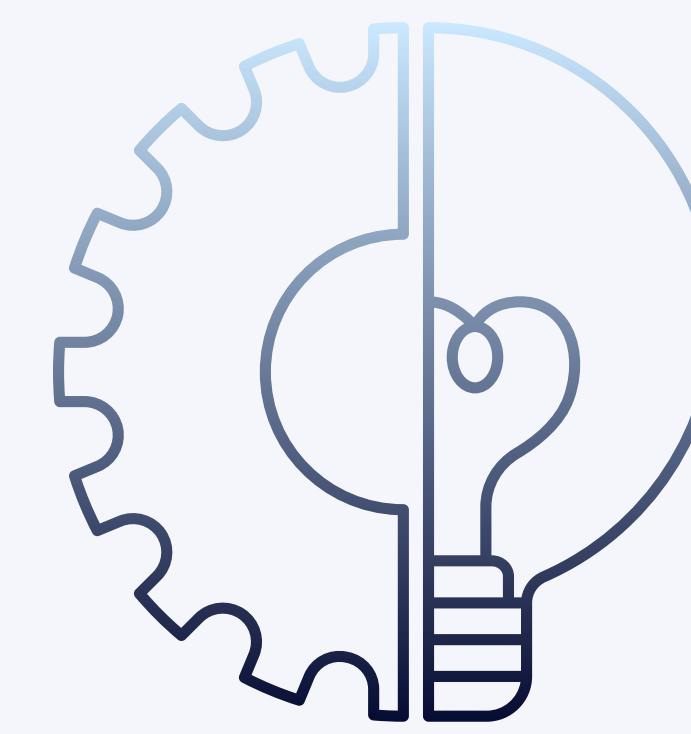


Each captured image will be stored to further increase the accuracy of the model by training the model on the newly captured images on a regular basis.





Future Features



01

Analysis of Crops

02

Water-level monitoring

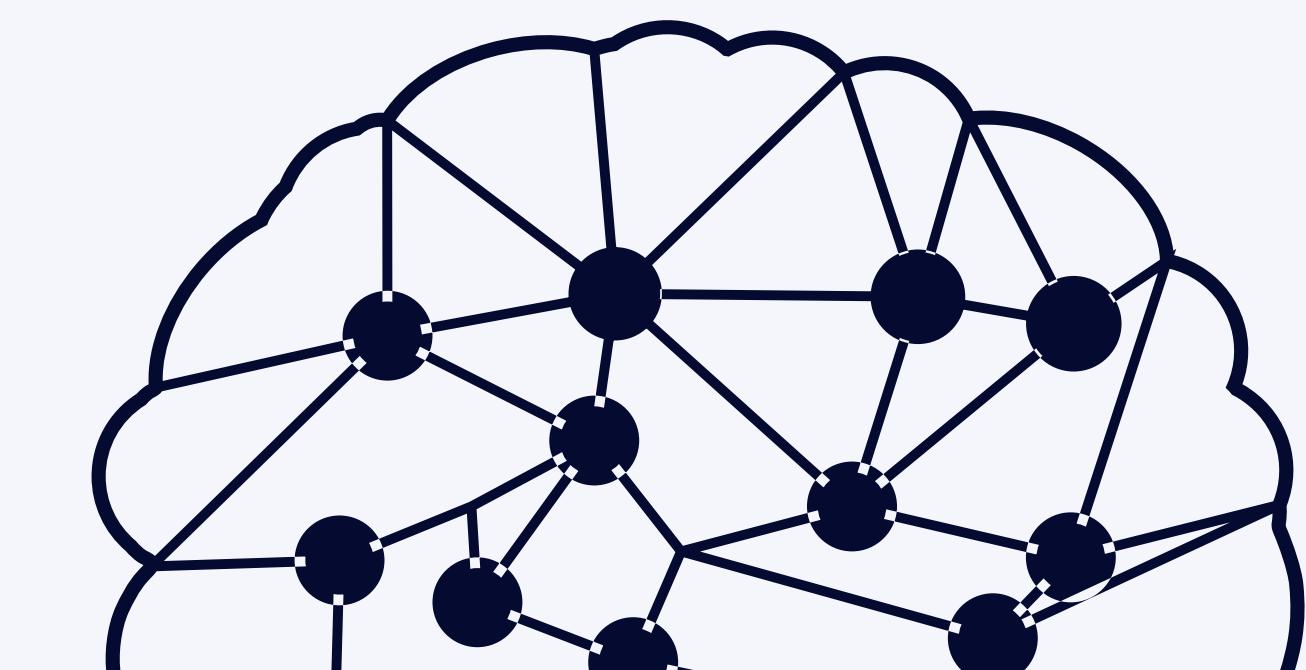
03

Soil health monitoring

04

Generalize and learn
from past experiences

With the help of human expertise, AI robots can significantly lower the cost of harvesting in agriculture.



Thank You

