

Flipkart 5.0 AI and Robotics Competition

- Title:- Robotics arm using AI for auto barcode scanning

- Requirement:-

- ① Arduino uno or Raspberry pi
- ② Servo-motor X 5
- ③ A cheap Webcam
- ④ python with opencv library for image processing
- ⑤ Artificial Intelligence

- Objective:-

① Ability to detect individual packages from a group of packages

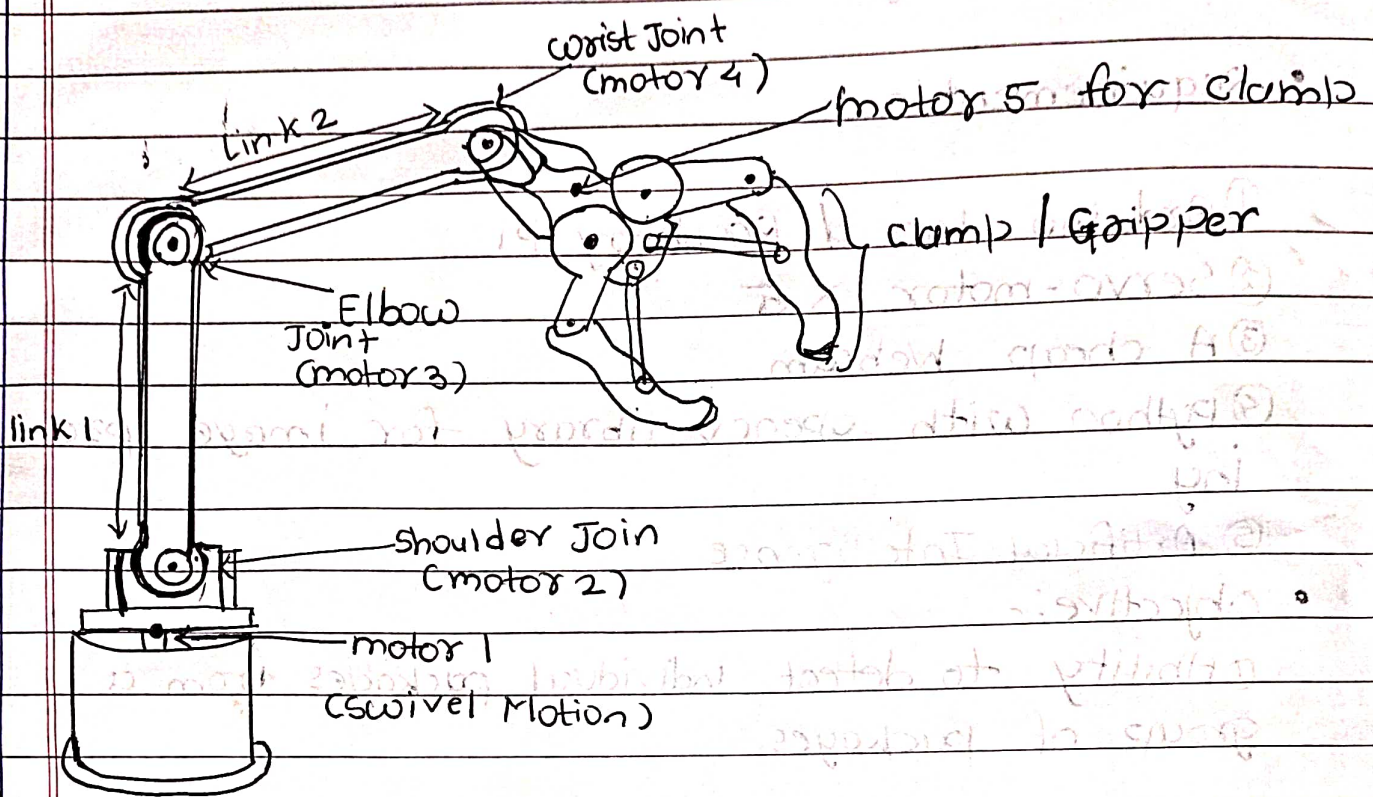
② Pick a package from that group and drop it in drop zone

③ shipment barcode should be present in the drop zone

- System Specifications:-

- ① A picking arm
- ② A picking methodology for end effector such as claw/clamp
- ③ You may use one or multiple vision systems, or a combination of vision and sensor based systems.
- ④ Your system can be connected to a live PC for processing input

• Design:-



• Project planning:- (in 1 month)

- ① Project planning and scope Definition (3 Aug - 5 Aug)
- ② Component Selection and Procurement (6 Aug - 9 Aug)
- ③ Mechanical Construction and Electronic Integration (10 Aug - 13 Aug)
- ④ Software and Algorithm (14 Aug - 20 Aug)
- ⑤ Task programming and optimization (21 Aug - 23 Aug)
- ⑥ Testing and Adjustment (24 - 25 Aug)
- ⑦ Documentation and Training (26 Aug - 28 Aug)
- ⑧ Presentation (29 Aug - 30 Aug)

• Technology Used for this project:-

1] Artificial Intelligence:-

In this project AI plays an role in enabling advanced functionalities. There are some function

① Object Detection and Recognition

② Grasping and Manipulation

③ Collision Avoidance

④ Learning from Demonstration

② Computer vision

Computer vision plays an vital role in a project involving robotic arm for repeated task. It enables the robotic arm to perceive and understand the environment, recognize object and make informed decision

③ AI Camera:-

AI camera is used for this following feature:-

① Resolution:- The camera should have a resolution suitable for the task requirement

② frame rate:- A higher frame rate allows the camera to capture fast-moving object

③ field of view:- The camera field of view should cover entire workspace of the robotic arm

④ Low light Performance

⑤ Dept Sensing

⑥ AI Acceleration

⑦ AI Integration:- Ensure the camera is compatible with popular computer vision libraries and framework like opencv or tensorflow

4] OpenCV computer vision libraries:-
opencv is widely used open-source computer vision and image processing library. It provides a wide range of function. This libraries used for

① Image processing

② feature Detection and Matching

③ object Detection and Recognition

④ Image Segmentation

⑤ Stereo vision

⑤ Arduino UNO Board:-

Arduino UNO Board is used for signal processing. All Servo motor is connected to Arduino, In Arduino upload the Algorithm for repeated task and Computer Vision libraries

⑥ Servo motor:-

Servo motor is rotated in only in 180° degree and is used for rotating arms.