

Design and Prototype Of IOT Based Robotic Arm for CNC Lathe Machine

KLE Dr. M. S. SHESHGIRI COLLEGE OF ENGINEERING AND TECHNOLOGY, BELAGAVI

PROBLEM STATEMENT

To increase the productivity and safety there is a need of adopting industry 4.0 the technology to overcome the problem related to productivity especially in the case of material loading and unloading section.

TEAM MEMBERS

INTRODUCTION

The trend in modern manufacturing has led to a paradigm shift from the conventional high method to heavily automated processes. This comes with a high cost for those who want to meet up to the increasing pace of this revolution as the machine and the knowledge to control them is becoming expensive. Two major areas that have contributed in shaping this achievement of the industry 4.0 are additive manufacturing and robotics. Especially students who need to learn the adequate skill-sets in order to efficiently perform in this fourth industrial revolution. Robotic arm is a reprogrammable and multifunctional manipulator design to assist

human in various surroundings. It is able to overcome human inefficiency in performing repetitive task such as pick and place operation. Thus, industrial in assembly and manufacturing have widely integrated robotic arm into their assembling line to overcome the problem of human inefficiency. Internet of things (IoT) allow data to be exchange between devices through the connection of many devices. The integration of internet of things with robotic arm allows smart industry to be realized. The purpose of this research is to design and build a robotic arm with a mechanical gripper. The robotic arm can be controlled remotely through android mobile device to perform pick and place operation.

IDEA GENERATION

Robotic arm control all points using their degree of freedom. A human arm can control by seven degree of freedom, articulated arm typically have up to six degrees of freedom. A robotic arm is made using different solid parts, joints by n number of joint connected, each joints having one degree of freedom if there n number of joint then arm have n degree.

In construction of our arm, we have five links which means 5DOF robotic arm.

We made use of six servo motors, since our structure is a three-dimensional structure. A

typical prototype that we employed is as shown in figure. The first servo motor is at the

base which rotates the whole arm. The second servo motor helps to move the arm 1. Third

servo motor rotates the arm 2. Fourth servo moves the arm 3. Fifth and sixth servo motor

are used to control the gripper arm which helps to hold the material which has to be picked. To control these motors the ESP8266 (NODE MCU) microcontroller is used which

is having in built Wi-Fi module in it. The coding for this software is done on Arduino

IDE software blynk web dashboard is created form which the signals arm sent to the

microcontroller all things are integrated with the coding and circuit connection is made

PROTOTYPE IMAGES

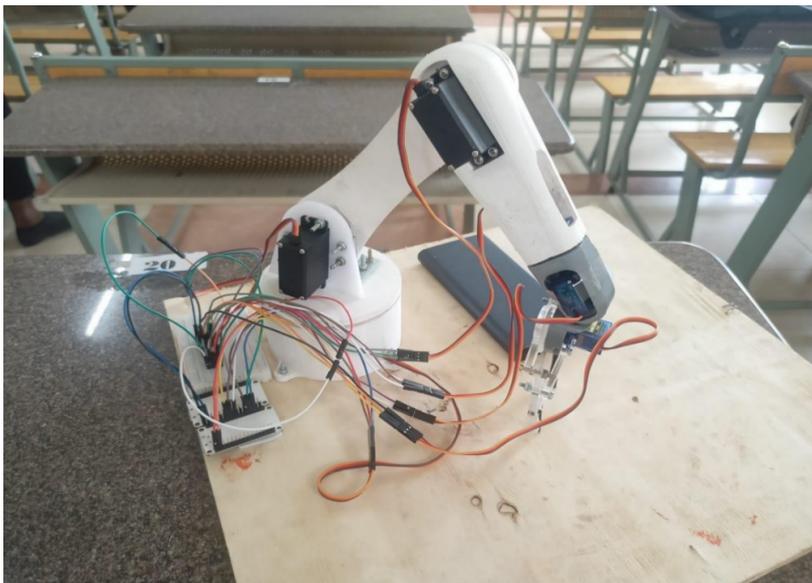


Fig: Front view of grain seperator