

Robotic Arm Control System based on wearable sensor

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Abstract– Disabled people with disabilities upper arms, elbows are more difficult to behave everyday life. Robot plays a vital part in making our lives more facile. The scope of our project is to provide a relation between human and machine by the interaction of human hand and robotic arm. The idea converges towards the conception of a robotic arm identical to human hand with gesture that is more precise by using flex sensor controlled by hand gesture . The main structure of the mechanical arm is made by using high efficiency of plastic material, moving fingers using servo motors and push-pull fingers by sling. and using open GL software application and Arduino Uno. When it comes to building your own robotics systems 3D printer is printed to create the real artificial arm and finger. The arm consists of five Degree of Freedom (DOF) and an end effector, which allows the interaction with the real world. The construction of the robotic arm adapts the principles of inverse kinematics and torque equilibrium. Robotic arm was controlled by the keypad which required a lot of practices and calculations to manipulate the robotic arm to reach desired position. The design and implementation of a sensor-based glove system attached to flex sensor that can be worn by the user. The vital part of the system which the robotic arm is equipped (for picking and placing the objects).

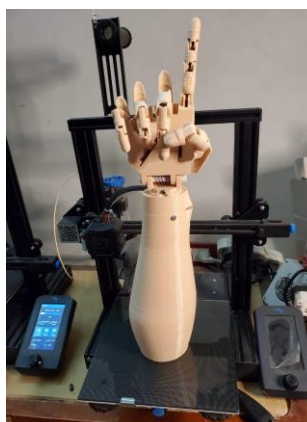
I. INTRODUCTION

Robotics is a current emerging technology in the field of science. A number of universities in world are working in this field. Robotics is the new emerging booming field, which will be of great use to society in the coming years. These days many types of wireless robots are being developed and are put to varied applications and uses. they still constitute the majority of upper limb amputations. Usually, young, active, and economically productive people are affected by traumatic amputations. Several robots have been built to do dangerous work that is impossible done by humans directly. One type of them that is very popular is the robot arm. The role of the hand in human life is not limited to physical/functional movements, but, rather, is intimately intertwined with psychosocial roles including gestures, caressing, communication, and sensation. Thus, successful rehabilitation after upper limb amputation requires a multi- dimensional, interdisciplinary approach. Robotic arms are the vital part of almost all the industries. In industries, a robotic arm perform various different tasks such as welding, trimming, picking and placing etc. Moreover the biggest advantage of these arms is that it can work in hazardous areas and also in the areas which cannot be

accessed by human. For example in NASA's mission to Mars, the Spirit and Opportunity drone. Robot is a term that is commonly used in today's environment in this developing era of technology. It can be defined as a task-performing machine that has the potential to positively transform lives and work practices, increase efficiency and safety, and provide service. The primary motivation for using any robot is to increase productivity, eliminate human labor, and save time. As we know that human hand is undeniably a work of wonder. In today's world there is an expanding need to create artificial hands for various inappropriate situations where human interaction is difficult or impossible. The main idea of our project is to design a robotic hand that will be controlled and will help disabled persons to perform their daily life tasks. The robotic hand can be used for a variety of purposes with this specification, including in conditions that are hazardous to human health. The tasks which will be achieved by the robotic hand are placing and picking the objects that are placed far away from the user, in a very easy way. The prime aim of the design is that the robot and platform starts the movement as soon as the operator makes a gesture or posture or any motion. The main frame of robot consists of robotic hand. The robotic hand is made up of plastic parts and 5 servo motors to control the motion of the hand. Every servo motor is moved according to the mapped angles. The joints of the fingers are moved in vertical direction while the thumb joints are moved in horizontal direction. The lifting and displacement of objects are performed by the combined motions of the servo motors. The method used to control the movement of robotic hand controlled by keypad and hand gesture

II. HELPFUL HINTS

A. Figures and Tables



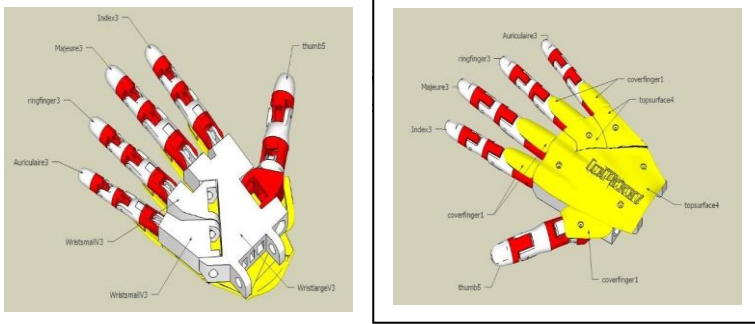


Fig. 4.2: Prosthetic Hand Design

Table 1-1 : Terminal Pins in Power Supply

Terminal Pin No. Assignment

Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4,5	DC OUTPUT -V
2	AC/N	6,7	DC OUTPUT +V
3	PE		

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