"MASTER-SLAVE ROBOTIC ARM USING MICROCONTROLLERS"

A Project Report submitted in partial fulfillment of the requirement for the award of the Degree of Bachelor of Engineering in Electronics & Communication Engineering of Visvesvaraya Technological University, Belgaum

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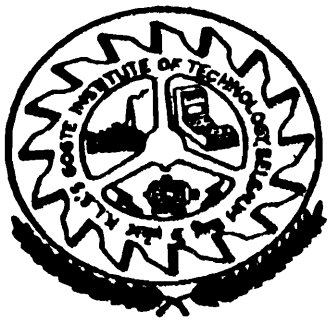

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Abstract:

In today's world there is a need for robots which can work in hostile environments without endangering human life for example diffusing bombs, picking up radioactive material and in various industrial applications. Such kinds of robots are expensive and are used extensively in advanced countries. There is a large scope for use of such robots in India. Most advanced robots are programmed and controlled by computers. Hence it is difficult to perform complex tasks using computer control. Such robots cannot replace the arm of a skilled person. The project consists of a robotic arm which mimics the human arm in real-time and hence it will perform the activities that a human arm can usually perform. Movements of this arm will be directly dependent on movements of the human arm. Such an arm can protect the human arm from exposure to hazardous activities. When mounted on rover such an arm can perform complex tasks in remote locations where it is difficult and dangerous for a human to work.

This project aims at building a robotic arm with 6 degrees of freedom using a master-slave control methodology. Special emphasis has been given to the ease of operation. The control rig is manipulated by the user's arm. The robotic arm mimics the dexterity of the human arm, hand, wrist and two fingers. The proposed master control unit is cost-effective and will have wide ranging applications in the fields of medicine, manufacturing, security, extreme-environment, entertainment and ROV (Remotely Operated Vehicle) teleoperation in undersea recovery or extraterrestrial exploration vehicle. The slave arm movement is controlled by servo motors. The slave arm is mounted on a wireless rover.

Keywords: *Robotic arm, Microcontroller, Atmega32, Wireless Transceiver, Servo Motor, UART.*