

PORTABLE AUTONOMOUS ROBOTS FOR SPYING AND BOMB DISPOSAL IN DEFENCE APPLICATION

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This system is very beneficial in areas where there is a high risk for humans to enter. This system makes use of a robotic arm as well as a robotic vehicle. This helps not only to enter a hazardous area but also to pick up the object however it wants to. It also includes a night vision camera, which will allow viewing of whatever is recorded during both the day and night. The whole system is controlled via RF remote. The system sends commands to the receiving circuit, which is placed on the vehicle. The receiver section has an 8051 microcontroller and a receiver that receives commands sent by the transmitter. The entire system, including the vehicle and the arm, is operated by pressing a button to move the vehicle in any desired direction, i.e., forward, backward, right, or left. By pressing the forward and backward push buttons, the user will be in control of the arm movement. Thus, this system makes use of a camera, a robotic arm, and a robotic vehicle to enter a high-risk area and also to pick, move, and drop an object, as well as record the place where it goes for future reference.

Keywords: Robotic arm, autonomous vehicle, 8051 microcontroller, RF controller

PORTABLE 4 DOF SCARA ROBOT ARM FOR LASER ENGRAVING, PICK AND PLACE PURPOSES WITH A GRAPHICAL USER INTERFACE.

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Industries, factories and basically all appliances are being automated as we speak. This robot is a mode automation generally used in manufacturing and assembly factories to do any task which requires much more energy and time when done manually by human hands. The robot works on a mechanical principle called Forward and Inverse kinematics. The robot is controlled by a custom graphical user interface made with programming IDE. The robot can either be controlled by determining the joint angles so that respective resultant coordinates be achieved or the other way around by the manipulator, which is the wrist of the robot. The arm can be applied for various purposes such as pick and place, assembly robot, tooling, cutting, laser engraving and almost every task that follows Cartesian coordinate's principle and within the work envelop of the robot.

The robot can be controlled by any microcontroller; here our choice of preference is a Arduino UNO. For rotary controls NEMA 17 Steppers are used. The whole assembly is 3d designed using Fusion 360, and printed in a reality 3D printer. The material used is PLA+ for internal gears and PLA for exterior body.

Keywords: Scara robot arm, laser engraving, 3D printer, microcontroller