

SORTING ROBOT

Prepared by: Rafi Mahabbat Bin Belal

ABSTRACT

An autonomous sorting networked robot or, ASNR (titled 'Sorting Robot') is an intelligent robot vehicle that can pick up randomly placed objects on a tabletop. The objects can be made of different materials (tin, paper and glass). The ASNR is a great robotic tool to sort different objects in a manufacturing plant. That is the necessity of sorting different raw material or finished goods in a manufacturing work space. The ASNR can successfully sort them and put them to correct boxes or preset location.

There have been numerous projects done to overcome the above mentioned problem. For example, pick and place robots, sorting robotic arm, all have the potential to overcome this problem. But the ASNR has the perfect solution and greater implications than these. It combines the mobility and picking ability of a robot and puts them in correct locations. Moreover, it has another unique functionality to track the number of objects it picks up and hence, can communicate with the outside world or central database. That way the exact number of raw material or finished goods can be recorded and sent over the internet. This enables the automated manufacturing process to keep track of the goods and know when the boxes or preset locations of objects are full. The ASNR has a graphical interface to show the type of object it has picked up by an LCD screen. It has a voice indication feature along with low light indicator.

Research has been done to gather necessary information before starting the project. The design of the ASNR chassis was a challenge because it had to successfully move around in a table top without falling down. It also had to support the weight of the robot. Research has been done about designing of the robotic arm system that suits this project best. Torque of servo motors and DC motors were studied. A sensor system was built to successfully locate the objects lying in the table. A sound sensory system was integrated to determine the material of the object. Adequate software programming was done to achieve the goals.

Numerous experiments were done individually before joining them together. These include servo motor PWM test, DC motor speed test, four wheel differential drive turning radius, robot arm test of lifting objects, ultrasonic sensor distance measurement, sound sensor testing, etc.

Overall, the project can be considered successful. It met all the objectives it was supposed to meet. The ASNR can successfully locate objects in a table. It can maneuver to the object and pick it up. It can determine the material it is made with. It can successfully put it in a preset location. It can relay the material and number of objects it picked up over the network to a central database. The ASNR has far reaching implications in the field of robotics and automated manufacturing process. It can be improved and used for collective intelligent sorting in a vast working area. It can also be controlled over the network remotely by some minor improvements. The ASNR can contribute to the BACHELOR OF ENGINEERING (HONS) IN ELECTRICAL & ELECTRONICS ENGINEERING 3+0 (University of Bradford, UK)

SORTING ROBOT

Prepared by: Rafi Mahabbat Bin Belal
scientific research field by deploying in a n unknown or dangerous terrain to gather specimen.