

OBJECT PLACEMENT ROBOT

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ABSTRACT

The Object Placement Robot is an autonomous robot that is used to determine the shapes of objects, namely Square, Rectangle, Triangle and Circle. The robot uses a custom made robot grip with limit switches on it and will be able to identify the object shapes once it is clamped. Objects with different shapes will have different edges, triggering different combinations of limit switches. The limit switches on the robot grip that are triggered will send signals to the PIC microcontroller, and the object shape will be identified.

The robot will pick up the objects at the North location and place them in their predetermined locations, namely square in North, rectangle in East, triangle in South and circle in West. The robot is able to travel from North to South, guided by an aluminum bar to provide a constant travel path to all 4 locations. When the robot is at the middle of the aluminum bar, its robot arm will rotate 360° to place objects in the East and West locations. Magnetic switches are placed at the origin, North and South so that the robot may know its current position.

360° servo motors and DC gear motor are used to move the robot arm and vehicle via the usage of H-bridge with relays. Each motor will respond upon receiving output signals from the PIC microcontroller in the form of PWM (duty cycle off and on). At the end of the object placement, the locations of each object will be displayed on an LCD display.

Overall, the main objective of this project which is to determine the shape of the four objects and place them in their predetermined locations was achieved.