

ABSTRACT

Robot is a mechanical device that can perform physical tasks, both using human supervision and control. One type of robot that is very popular and the simplest is the robot arm system. The painting process becomes a necessity to beautify a room, where automatic wall painting tools can be used as a solution to ease human work, which can help routine tasks in the process of painting walls in a room.

In this final project, a wireless wrist gesture arm manipulator robot control system is designed using an ATmega328-based microcontroller, namely Arduino nano and uses an MPU-6050 sensor, 2.2 inch flex sensor and nRF24L01 module as a wireless module so that they can communicate with each other. Arduino nano was chosen because of the microcontroller in addition to its complete features and small dimensions so it does not take up space. The movement of the arm manipulator robot is detected by the MPU-6050 sensor to detect changes in position on the x, y, and z axes so that the arm manipulator robot can move according to changes in the position of the operator's wrist that moves up, down, right and left when the nRF24L01 module can send a command to the MG996R servo. This tool is made with the aim of painting a flat wall surface if there is a wall that has not been exposed to paint we can direct it towards a wall that has not been exposed to paint with the desired direction of the operator's wrist position. .

The test results of the arm manipulator robot device show that this hardware can function to paint a flat wall surface as planned. In this test, it was obtained that the diameter of the paint spread at a distance of 30 cm got 36 cm², at a distance of 45 cm it got 54 cm², at a distance of 60 cm it got 60 cm², at a distance of 75 cm it got 66 cm², and at a distance of 90 cm it got 72 cm². This controller can move characters using sensors whose values can change according to hand movements, this can be seen on a serial monitor or serial plotter. Then the number will set the microcontroller to send commands to the left, right, up and down. This is in accordance with what has been tested on the arm manipulator robot where all flex sensors can function properly, the nRF24L01 wireless module can communicate with each other and the MPU-6050 sensor has sent data properly so that all servos can work properly. From the test results, it is stated that this tool is feasible to use.

Keywords: Arm Manipulator Robotic Arm, Wall Painting Robot, Flex Sensor, Servo MG996R.