VIETNAM NATIONAL UNIVERSITY - HCM

Ho Chi Minh City University of Technology

Faculty of Computer Science and Engineering

LOGIC DESIGN PROJECT

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CONTENT

REPORT

INTRODUCTION:

In this project, we have designed a simple Hand Gesture Controlled Robot using Arduino. This Hand Gesture Controlled Robot is based on Arduino Nano, MPU6050, RF Transmitter-Receiver Pair and L293D Motor Driver.

-Preface:

A Robot is an electro-mechanical system that is operated by a computer program. Robots can be autonomous or semi-autonomous. An autonomous robot is not controlled by human and acts on its own decision by sensing its environment.

Majority of the industrial robots are autonomous as they are required to operate at high speed and with great accuracy. But some applications require semi-autonomous or human controlled robots.

Some of the most commonly used control systems are voice recognition, tactile or touch controlled and motion controlled.

One of the frequently implemented motion-controlled-robot is a Hand Gesture Controlled Robot. In this project, a hand gesture-controlled robot is developed using MPU6050, which is a 3-axis Accelerometer and 3-axis Gyroscope sensor and the controller part is Arduino UNO.

Instead of using a remote control with buttons or a joystick, the gestures of the hand are used to control the motion of the robot.

The project is based on wireless communication, where the data from the hand gestures is transmitted to the robot over RF link (RF Transmitter – Receiver pair).

The project is divided into transmitter and receiver section. The circuit diagram and components are explained separately for both transmitter and receiver sections.

-Principle of Hand Gesture Controlled Robot:

In order to understand the principle of operation of Hand Gesture Controlled Robot, let us divide the project into three parts.

The first part is getting data from the MPU6050 Accelerometer Gyro Sensor by the Arduino. The Arduino continuously acquires data from the MPU6050 and based on the predefined parameters, it sends a data to the RF Transmitter.

The second part of the project is the Wireless Communication between the RF Transmitter and RF Receiver. The RF Transmitter, upon receiving data from Arduino (through the Encoder IC), transmits it through the RF Communication to the RF Receiver.

Finally, the third part of the project is decoding the Data received by the RF Receiver and sending appropriate signals to the Motor Driver IC, which will activate the Wheel Motors of the Robot.

TASK MANAGEMENTS:

NAME	TASK
Hồ Anh Tài	Report writer Transmitter Section
Nguyễn Quan Trường	Prepare components Receiver Section
Nguyễn Hữu Anh Hiếu	Board implementation Decoding Data and Out-put