Scuola universitaria professionale
della Svizzera italiana

Dipartimento
Tecnologie
Innovative

Intern Experiments

Using a Stepper Motor

Hardware: Arduino + Motor Driver + External Electronics

A. Rivero - S. Guatierri

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Introduction

This document describes the Stepper Motor control using Arduino and external electronics.

1. **Learn what is a stepper motor:** (half day)

   Student must do a small research of what is a stepper motor.

   description of the kinds of steppers (Unipolar - Bipolar).

2. **Learn how to use a stepper motor:** (half day)

   Student must make a small research of how to control the two kinds of motors and learn the sequences for each stepper.

   Student must identify the HW needed to connect the Stepper to the Arduino. (use of LM293/LM293D)

3. **Programming the sequence using Arduino:** (one day)

   Using PINx of the Arduino's API

   Stepper in clockwise way direction

   Stepper in counter clockwise way direction

   Stepper in both directions

   Using the PORTx of the microcontroller

   Stepper in clockwise way direction

   Stepper in counter clockwise way direction

   Stepper in both directions

4. **Optimise the program Part 1** (one day)

   Understand the use of push buttons using Arduino

   Identify the bouncing effect

   solve the problem using "anti-bouncing" techniques

   Add the use of push buttons to define the direction of the stepper motor (left and right).

   Add the use of push buttons to set the velocity of the stepper motor

5. **Optimise the program Part 2** (one day)

   Introduce sensors to identify the position of the motor.

   MORE IDEAS TO ADD HERE