Overview

PhysStick is the perfect project to learn the basics of programming, electronics, physics and most importantly, have fun.

In the course of the project we will teach you:

- How to create a complete project in C++.
- How to change the blinking frequency of a led
- To use the arduino UNO, one of the most famous microcontrollers.

This pointer is controlled by an arduino Nano, which activates an stroboscopic light that changes its frequency with a touchscreen and the rotation of the stick.

The main utility of the PhysStick is to show the aliasing effect; when a light blinks with a frequency equal to the rotation of a spin (such as a simple fan), it creates a visual effect to make the spin still.

There are many other experiments that you could try with PhyStick in your home like: "Stop" water falling, experiment the Huygens-Fresnel principle or whatever you can think of.

Otherwise, if you are a teacher, the stick can be used to explain physics theorems in a much funnier way than books or maths.

Components

- Arduino Nano
- TFT LCD touchscreen 2.8'' IC ILI9341
- 50W White LED Diode
- MPU6050 module with analog 3-axis gyroscope + 3-axis accelerometer sensors
- 3.7 V 1500 mAh LiPo battery
- DC Boost
- Protoboard and wires

Assembly

You have been given a protoboard and wires, now it´s time to have fun, let´s solder your Phystick. Here you have the schematics that you need to follow:
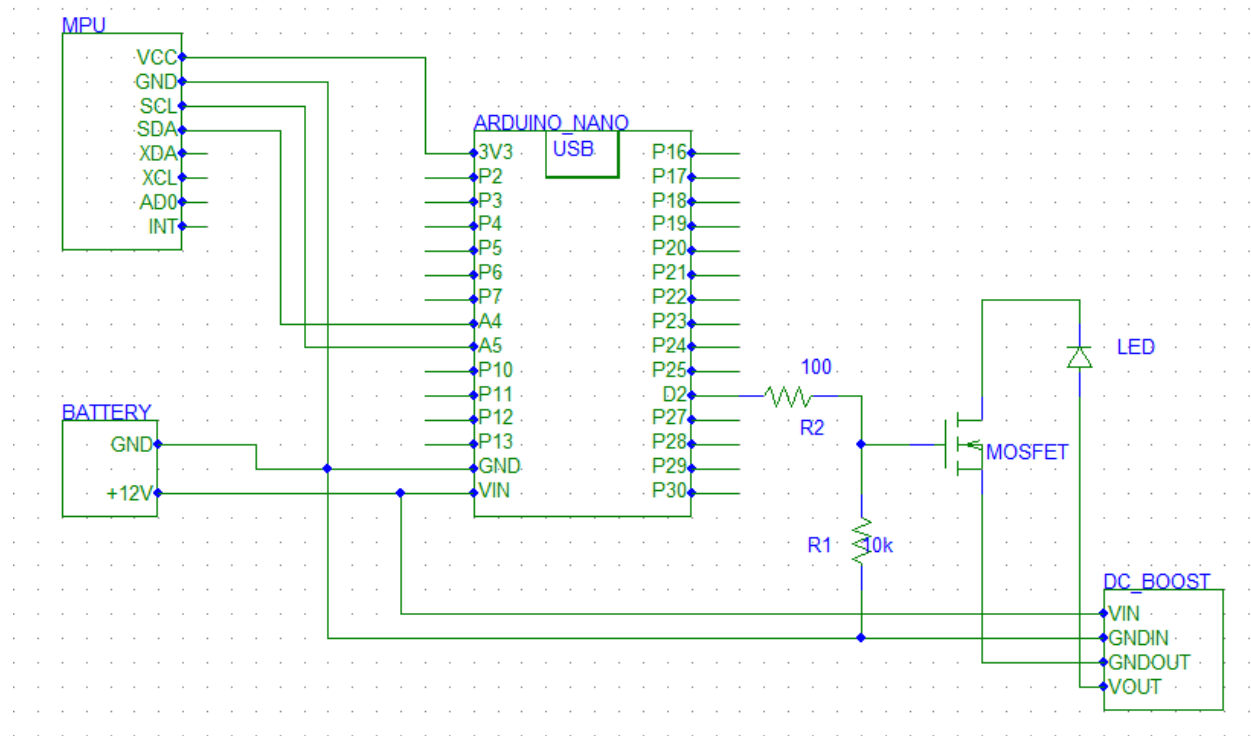
How to use

In order to use Phystic properly, we basically have to know two things: how to change our light frequency so that we can adapt it to the spin we are pointing at; and also how to control our LCD touchscreen.

For the first one, if we want a higher frequency, we must rotate our Phystick to the right side from the starting position (touchscreen upwards). In the same way, if we want to decrease the frequency, we have to rotate Phystick to the left way.

With regard to the LCD touchscreen, once we power on Phystick, we will have a starting menu where we can select basic options such as the sensitivity (Hz we increase our starting frequency depending on the angle of rotation), …. Also, we will be able to see the current frequency our LED is blinking at, so that we are able to know at the same time the frequency of our rotating object and whether we have to increase or decrease our light blinking speed.

FaQ