VibraSight

A Hackduino 3.0 Project

Report

Testing of the components	:	Done (GPS module - Probably defective)
Integration to the project	:	Done (LiDar,MPU,GPS module couldn't be used)
Assembly and Testing	:	Done

We had some setbacks, but the device is now functional; it uses the Yolo V8 model in nano size, exported in onnx format for faster speeds when running on CPU.

Hardware	Price
Raspberry pi 4 Model B	5050
SanDisk Ultra microSD	430
Raspberry Pi Camera V2	1800
Arduino NANO	300
Button sized Vibrator Motors	300
Power Bank	500
Walking Stick	600
Gloves	135
Earphone	200
Total	9315

Power Consumption

With the current setup the device can run for about 1 hour with a 10000 mAh power bank

Device	Power Consumption (per hour in mAh)
Raspberry pi 4B	3000
Arduino NANO	19
Button sized Vibrator Motors	1200
Total	4219

Possible Improvements

With a better GPS module, Google maps API can be used.The GPS neo 7m module works on a specific condition it does not work on indoor conditions.

The LIDAR GS2 has a window based interface.Thus it didn’t integrated with raspberry pi.So, a Linux operated LIDAR module can be used.

A Smartphone can replace the Raspberry Pi, Camera and the Power bank.

Vibrasight

Our project has all three primary hardware different in it.

1. Microcontroller
2. Sensors
3. Actuators

Microcontroller

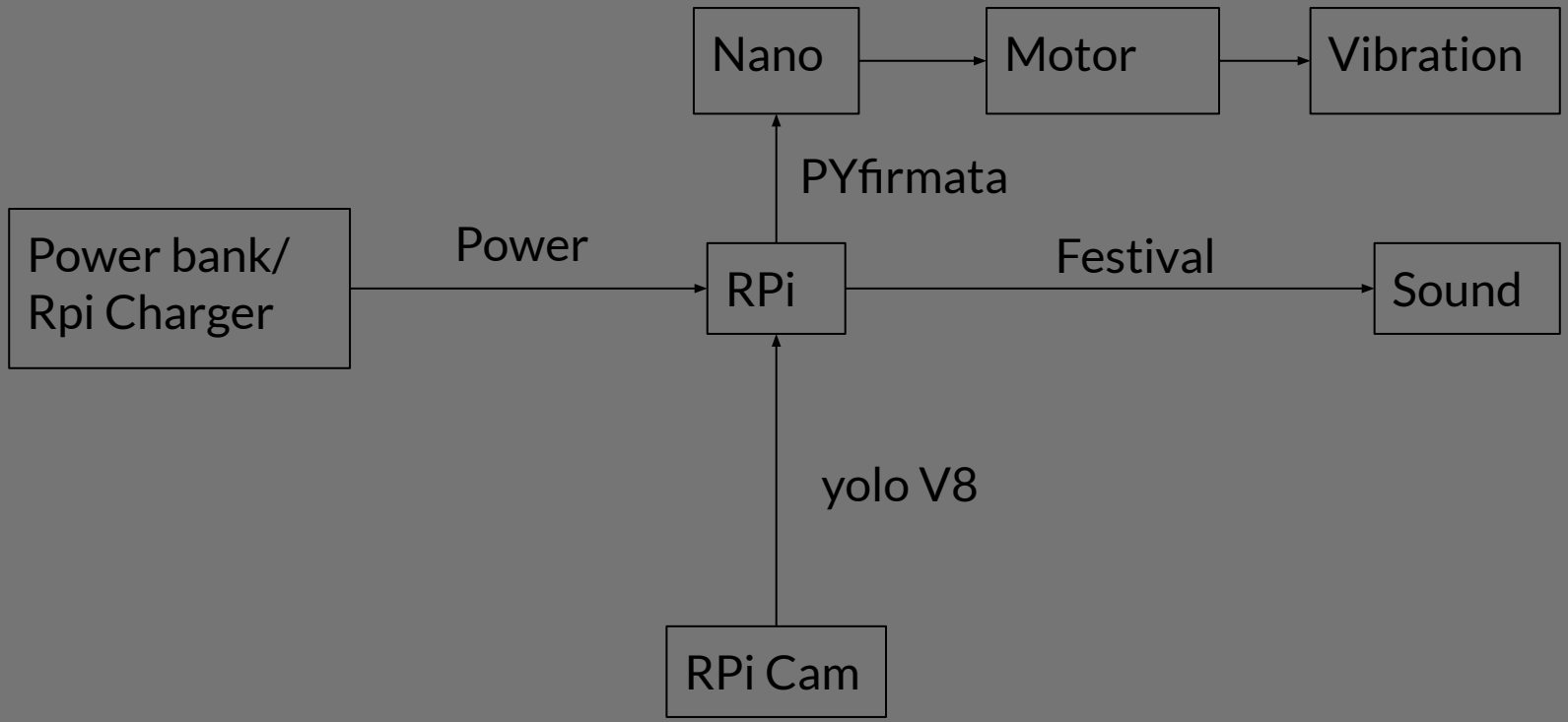
Our stick uses Raspberry Pi 4 as its primary processing unit, which provides a greater processing power as compared to any Arduino board.

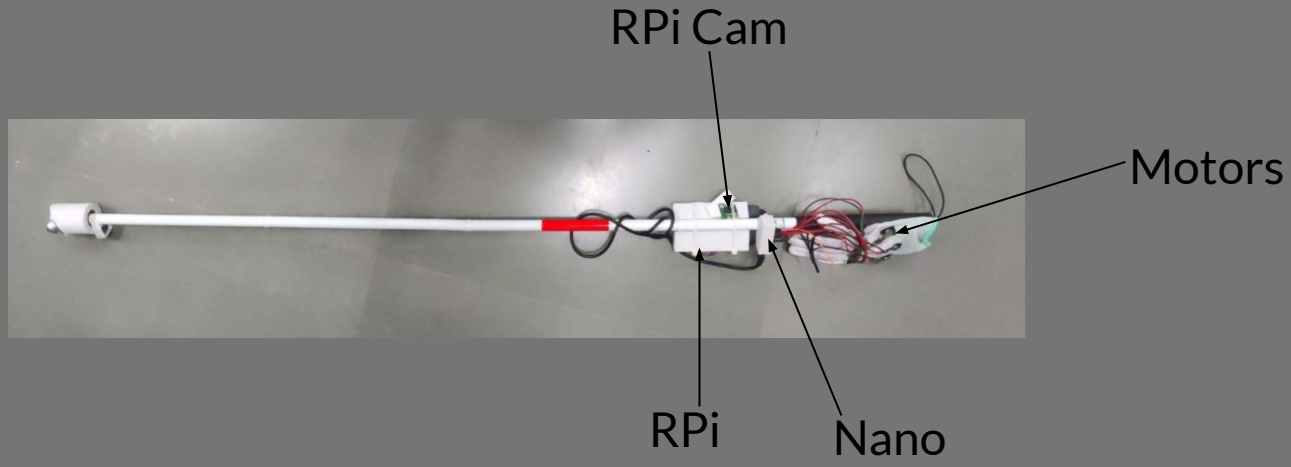
Sensors

Our stick has a sensors integrated into it.
1. Pi v2 camera module
The camera module does the task of object detection.

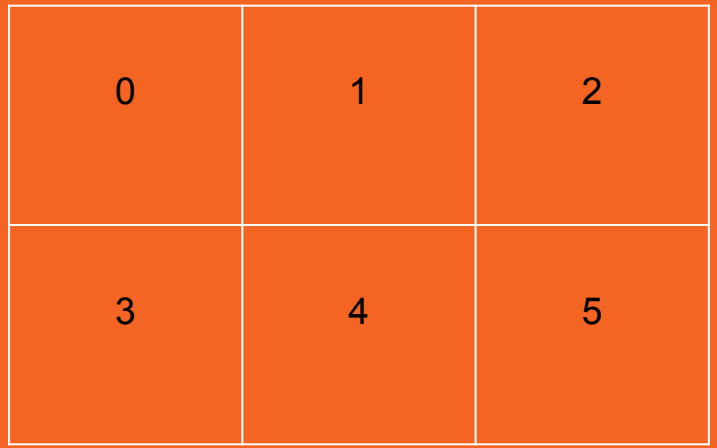
Actuators

Our stick has a set of vibrator motors to provide better haptic feedback for the user instead of buzzer.It is helpful to an extent when our user deaf as well as blind.


Nano
Motor
Vibration
PYfirmata
Power bank/
Rpi Charger
Power
RPi
Festival
Sound
yolo V8
RPi Cam


RPi Cam
Motors
RPi
Nano

The input image has been divided in sections were each section corresponds to a actuator. So the approximate location of the detected object is conveyed to the user.



Code