

Raspberry Pi Hardware Development & Tutorials

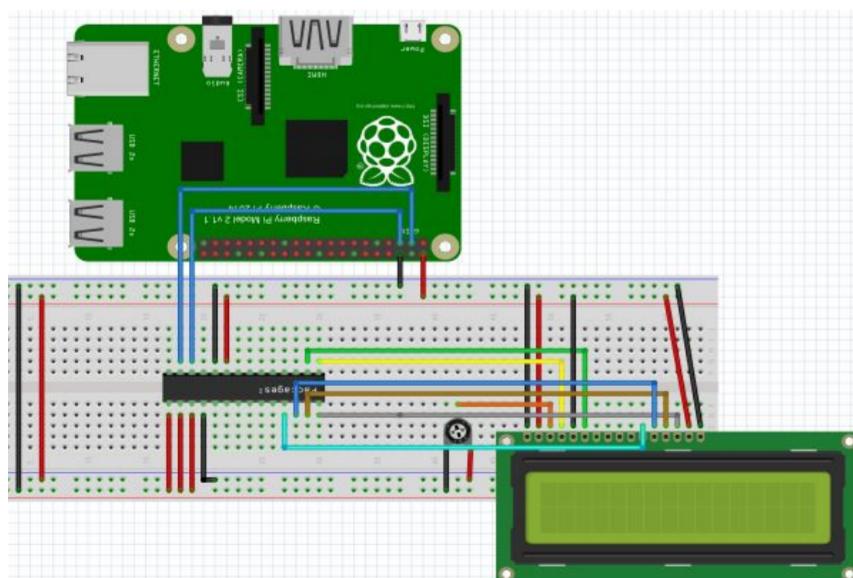
Aditya Kumar, Pritish Salunke, Mentor: Rutuja Ekatpure, Deepa Avudiappan

Abstract: Development of different Hardware module for Raspberry Pi. Establish Communication between Raspberry Pi and other device using different communication protocol.



Modules covered:

1. Accessing GPIO pins
2. Interfacing Port Expander
3. Interfacing Analog to Digital Converter
4. Interfacing PWM Driver IC
5. Interfacing DC motor
6. Interrupt on Raspberry Pi

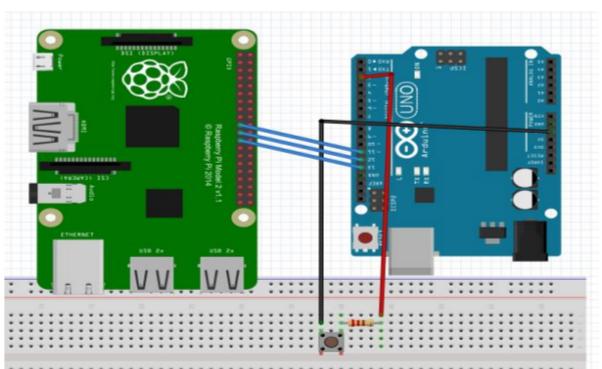


Communication Protocol

1. UART Communication:
 - 1.1 Bluetooth Module
 - 1.2 Xbee Module
 - 1.3 Communication between Firebird V and Raspberry Pi



2. SPI Communication:
 - 2.1 Interfacing ADC
 - 2.2 Communication between Arduino and Raspberry Pi

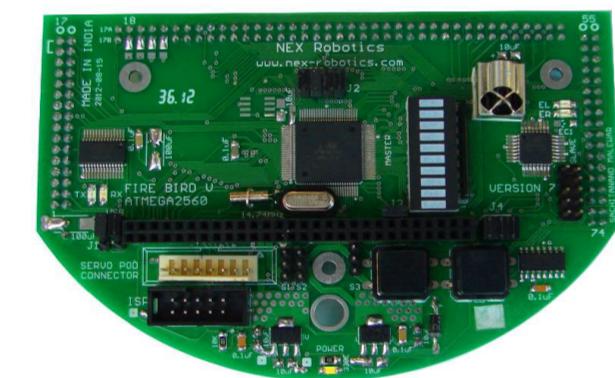


3. I2C Communication:
 - 3.1 Port Expander
 - 3.2 PWM Driver
 - 3.3 Communication between Arduino and Raspberry Pi

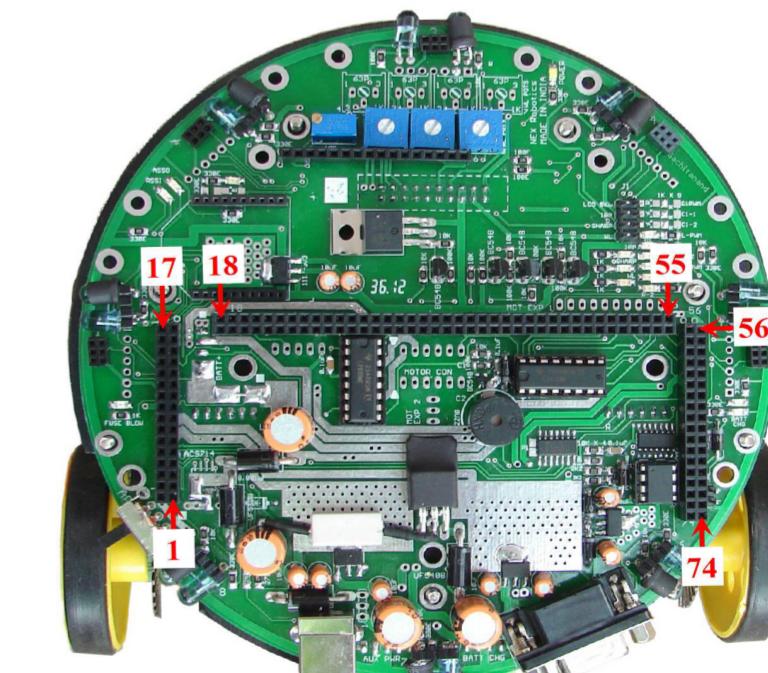
FUTURE PLANS & APPLICATIONS

Make a PCB Shield for Raspberry Pi which will enhance capability of Firebird V robot.

Raspberry Pi is an Excellent tool for Dynamic and Real time Image Processing. So, by using Raspberry Pi instead of AtMega 2560 on Firebird V we can implement much complex themes comprising image processing, as the programming in python makes it much easier.



Raspberry Pi based Adaptor Board



Main Board of Firebird V Robot