



Project Proposal

App remote controlled robot cam with Raspberry Pi

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User Defined Project (UDP)

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Definition and Objectives of the Project:

- This proposed system uses raspberry pi to control a robot via web page hosted wirelessly on pi.
- Camera is connected with raspberry pi for video stream. The browser should be able to send control signals to the Raspberry Pi to control the robot.
- On web page we will be able to see robot with the live streaming.

Scope of Project:

- If anyone disconnects the camera module from the Raspberry Pi then we couldn't see video streaming or at a time if any error in program of Raspberry PI.

Design Components:

Components for this projects are as below:

| No. | Hardware Components | Softwares |
|-----|---------------------|-----------|
| 1 | Basic Robot chassis | Putty |
| 2 | Raspberry Pi 2 | WinSCP |
| 3 | Motors – 2, 300RPM | HTML |
| 4 | Camera module | MySQL |
| 5 | Power supply 9V | |

Table1.0: Design Components

Implementation Plan:

Implementation was divided into three separate parts: motor related work, web related work and camera related work. These parts were implemented as parallel. During the implementation, few features needed some modification.

Design detail:

Functional Block Diagram of the Project:

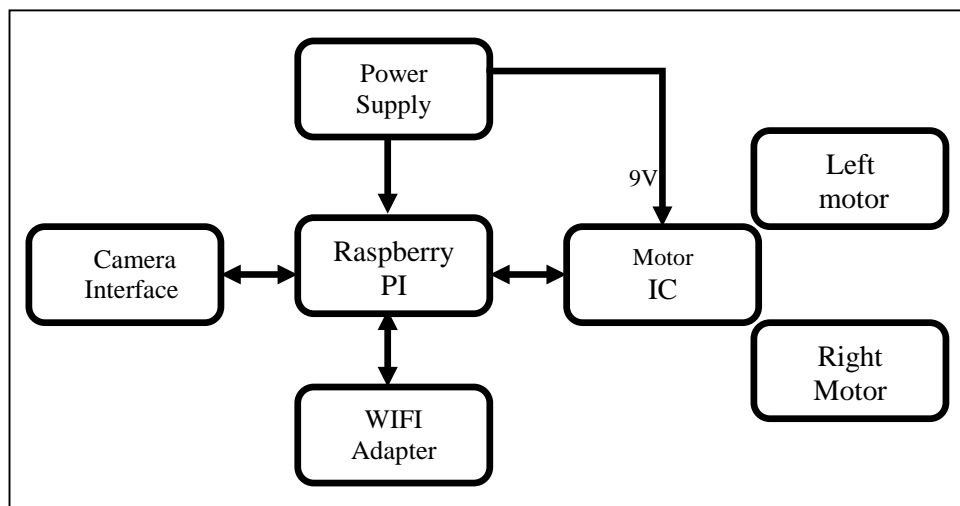


Fig1.0 Block Diagram

Description of design:

The design consists more on actual planning of hardware part than the code to be created. This section can be divided into many parts: raspberry pi, camera design, Motor control design, Software design, Software flow diagram

- **Raspberry pi 2:** The Micro SD card is used for installing OS and the complete project will be done with python coding. The board has specification:
 - A 900MHz quad-core ARM Cortex-A7 CPU
 - 1GB RAM
 - 4 USB ports
 - 40 GPIO pins
 - Full HDMI port
 - Ethernet Port
 - Combined 3.5mm audio jack and composite video
 - Camera Interface
 - Display Interface
 - Micro SD card Slot
 - Video core IV 3D graphics core
- **Camera design:** Using a simple plug-in Raspberry Pi camera module, which will use for video streaming the output we can see on the web page that design for user. Since Raspberry Pi has a ready-to-use socket for camera cable, no extra cables or power supplies are needed.
- **Motor control design:** To control the motors, L293D motor control chip is used. Which is cheap and easily available. Design consisted of two motors. Design uses GPIO pins 17 and 18 to control the first motor and pins 22 and 23 to control the second motor. The 9V one battery will supply power for both of the motors, and Raspberry Pi will supply power for the motor control chips.
- **Software design:** Project requires software for two main things: camera control and motor control. Raspberry pi 2 will connect with Putty software to Login into Raspberry pi. Then send files from Laptop to Raspberry pi WinSCP software will be used.

Verification Plan:

- The project will be simulated in the software first using the programming of the raspberry pi 2. Individual level for each component will be tested.

Cost: Total expected cost of material is Rs. 5000.

| No. | Material | Quantity | Price(Rs.) |
|-------|----------------|----------|------------|
| 1 | Raspberry Pi 2 | 1 | 2400 |
| 2 | Micro SD card | 1 | 500 |
| 3 | Camera | 1 | 1200 |
| 4 | Motor | 2 | 120 |
| 5 | Battery (9V) | 1 | 30 |
| 6 | Jumper wires | 10 | 30 |
| Total | | | 4280 |

Table2.0: Cost of the Project

Schedule:

Time schedule for the overall project in the form of a chart showing the detailed.

| | Week 1 | Week 2 | Week 3 | Week 5 | Week 7 | Week 8 | Week 9 | Week 11 |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|---------|
| Task Item | | | | | | | | |
| | | | | | | | | |
| Proposal approval | | | | | | | | |
| Work package description | | | | | | | | |
| Design & draw schematics | | | | | | | | |
| Layout of full design | | | | | | | | |
| Prepare Bill of Material | | | | | | | | |
| Individual Components Test | | | | | | | | |
| Board Level Test | | | | | | | | |
| Unexpected issues | | | | | | | | |
| Demonstration | | | | | | | | |
| Design documentation | | | | | | | | |

Table3.0: Schedule

Deliverables:

- Design report
- Hardware board
- Software code file
- Project report