

# IOT based Cinematic Camera Rover

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**Abstract**— The current working system is based on “IOT BASED CINEMATIC CAMERA ROVER”. It is a IOT based Hardware Rover. Being a photographer we always face a problem while taking moving low angle shots. This is due to man handling the equipment which always creates a room for error. This is where our idea took root from. Looking to our problem, firstly we had to build something that is capable enough to take low angle shots that too while carrying a DSLR. So we planned to build a rover which has a mechanical arm which can act as a stabilizer. Such a powerful device will need powerful components such as Raspberry pi, Rover, Mechanical arm. This Futuristic development can ease life of a photographer.

**Keywords:** Raspberry Pi, Rover, Photography, Videography, IoT, Automation

## I. INTRODUCTION

Artificial intelligence is an area of computer science that deals with giving machines the ability to seem like they have human intelligence. Ultimate AI would be a recreation of the human thought process that is a man-made machine with our intellectual abilities. This would include the ability to learn just about anything, the ability to reason, the ability to use language and the ability to formulate original ideas. Robotics are nowhere near achieving this level of artificial intelligence, but they have made a lot of progress with more limited AI. Robotics is a branch of engineering that involves the conception, design, manufacture, and operation of robots, that can do the work of a person and that works automatically or is controlled by a computer. The major objective of this project is to reduce man power. It is an interactive robot i.e. it can communicate with humans and performs the task given by the user. There are two way to control the robot, first way is by using web application that contains the buttons to control robot as well as it displays the live stream video i.e. Videography, making it IoT application. Not only this but, the rover will be able to take low angle shots using the camera mounted on it. This gives more stability and precision than the gimbal and other handheld instruments. So, eliminating the human error, the working is made efficient.

### A. Main Content of Cinematic Camera Rover:

The idea is to control the rover using low level commands return with Python Scripts commanded straight from an HTML page.

We will develop a web page which will supervise and control the rover and also the camera on the rover.

For this we will use the Raspberry pi3 as the mediator after turning the raspberry pi ON it will connect to a mobile hotspot and through it we obtain its IP address this IP will be entered in the webpage to connect it to the rover. The webpage created has Button on it which will control the speed, Direction of the rover and also the direction at which the camera will be facing. Also the camera will Live Stream on the webpage.

### B. Functions in Cinematic Camera Rover:

The system proposed here is a multifunctional assistive robot based on field of artificial intelligence.

The hardware requirements for the remote node are as follows:

#### 1) Raspberry Pi

The Raspberry Pi 3 Model B is the earliest model of the third-generation Raspberry Pi. It replaced the Raspberry Pi 2 Model B in February 2016. Its features are Quad Core 1.2GHz Broadcom BCM2837 64bit CPU, 1 GB RAM, BCM43438 wireless LAN and Bluetooth Low Energy (BLE) on board, 100 Base Ethernet, 40-pin extended GPIO, 4 USB 2 ports, 4 Pole stereo output and composite video port, Full size HDMI, CSI camera port for connecting a Raspberry Pi camera, DSI display port for connecting a Raspberry Pi touchscreen display, Micro SD port for loading your operating system and storing data.



Fig. 1: Raspberry-Pi 3

#### 2) Rover 5

Rover 5 is a new breed of tracked robot chassis designed specifically for students and hobbyist. Unlike conventional tracked chassis' the clearance can be adjusted by rotating the gearboxes in 5-degree increments. “Stretchy” rubber treads maintain tension as the clearance is raised.

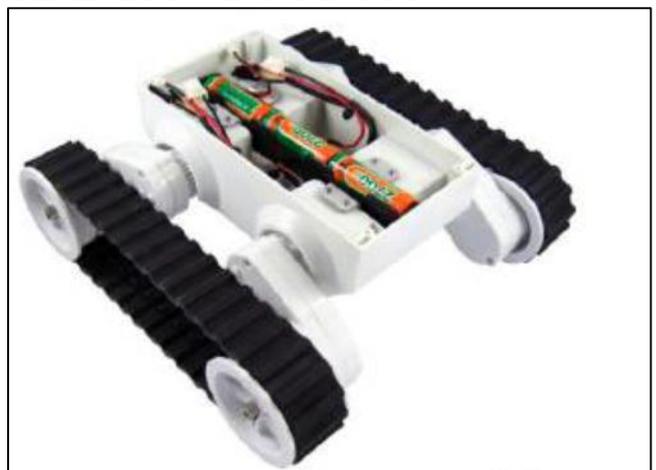


Fig. 2: Rover 5

Each gearbox has an 87:1 ratio includes an optical quadrature encoder that gives 1000 pulses over 3 revolutions of the output shaft. The chassis can be upgraded to include four motors and encoders making it ideal for wheels.

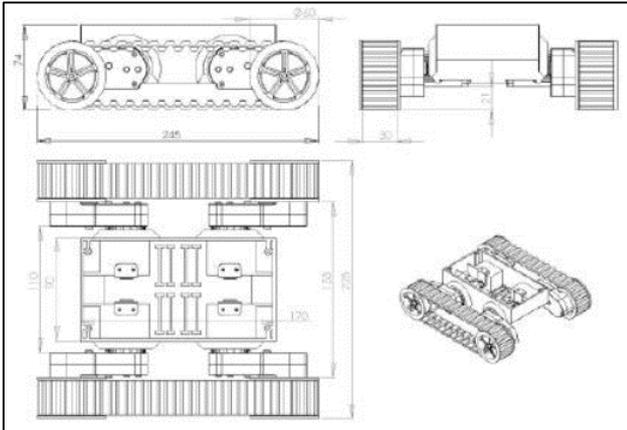


Fig. 3: Rover 5

### 3) Raspberry Pi Cam

The Raspberry Pi camera module can be used to take high-definition video, as well as stills photographs. It's easy to use for beginners, but has plenty to offer advanced users if you're looking to expand your knowledge. There are lots of examples online of people using it for time-lapse, slow-motion and other video cleverness. You can also use the libraries we bundle with the camera to create effects.

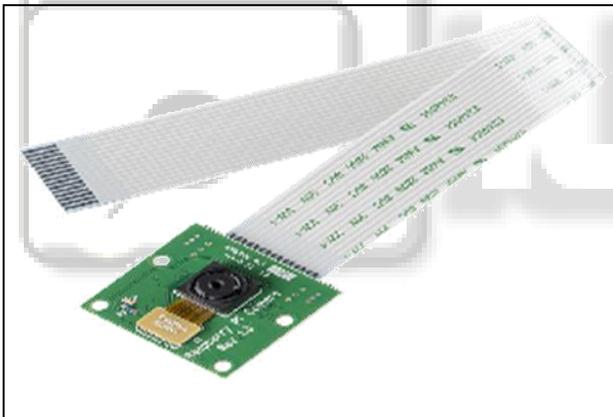


Fig. 4: Raspberry Pi Cam

The above mentioned Pi-cam has inbuilt microphone which is used for voice-recognition.

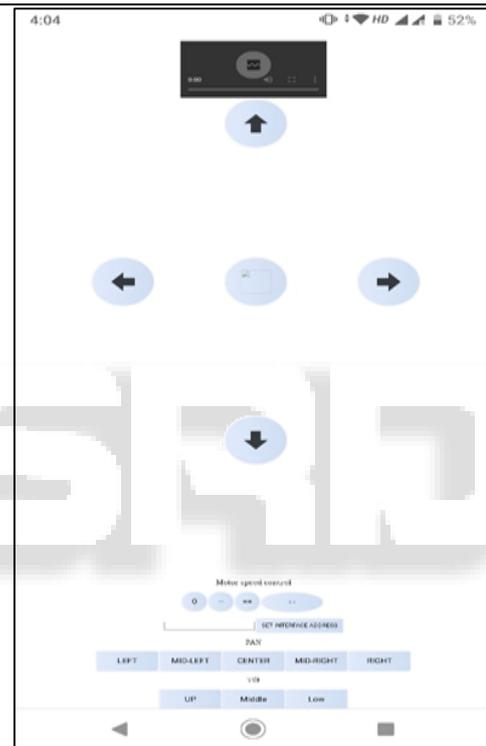
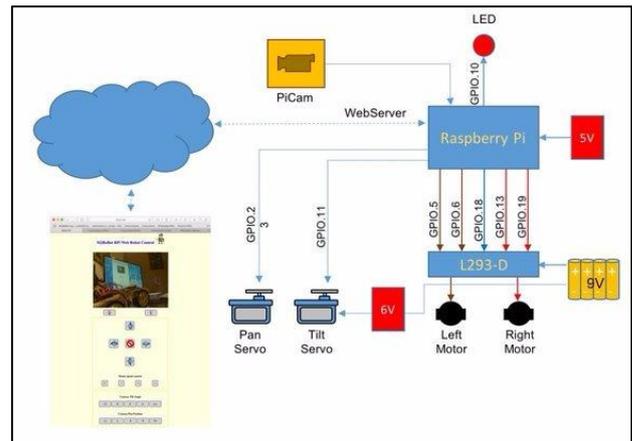
### 4) SD Card

The SD card is installed with the O.S image and is also used as an internal storage for the Raspberry Pi. In this research, Scandisk Class 10 16GB SD card is used.

### 5) Power Supply

Raspberry Pi Model B requires voltage of 5V and minimum 700mA current to work. In this research Samsung USB charger with power supply 5V 2A is used or a Power bank of 10000mah is used to make it portable. These components are connected together to build the robot which can perform multiple tasks.

## II. IMPLEMENTATION AND RESULT



## III. CONCLUSION REMARK

The Rover is developed to overcome the drawbacks and research gap between the existing system & proposed system, henceforth concluding proposed system will be much better in comparison with overall caliber. Looking to a longer perspective and long-term goals this rover can also be beneficiary for all the photographers as well as the cinematographers.

As this rover is an IOT-based System, it will be purely wireless and the rover itself is quite mobile. And since the tires and chassis are robust it will be stable on any terrain. Maximum Cost-Cutting will be done as cost of gimbal is completely removed. Also since the human error is removed the shots and videos will be precise and stable.

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