

## A Review Paper on Raspberry Pi

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### Abstract

*The Raspberry Pi is a very powerful computer having the dimensions of a business card. In this paper we review Raspberry Pi whose popularity has taken the learning process and application of ideas to a whole new level. We also discuss some of the best projects that have come up so far.*

**Keywords:** Raspberry Pi, Business card etc.

### 1. Introduction

The engineers with a pragmatic approach are the biggest boon to a society. The application of ideas, theories, new innovations is what drives them. For years the work was done on Arduino boards but with the launch of the very cheap Raspberry Pi it all changed.

Raspberry Pi's inception began in 2006 it was finally released on 19 February 2012 as two models: Model A and Model B. After the sale of 3 million units in May 2014, the latest Model B+ was announced in July 2014.

It contains many minor improvements based on the user suggestions without any increase in price.

Raspberry Pi board costs only \$35 and does the work of a computer costing hundreds of dollars. Though its purpose is not to replace computers, laptops etc. but to work in supplement with them.

This card is stunning in style and design and its looks aren't far away from a James Bond style gadget. Boot it up, and you have a got a fully functional powerhouse. Grab a four-gigabyte SD card and flash it with the free Linux-based operating system on the Raspberry Pi Foundation's website. Put the SD card into the slot, apply power, and you've got a 700 megahertz workstation with hardware accelerated 3-D graphics—something that would have been state-of-the-art in 2001 and set you back several thousand dollars.

Computers are now utilities essential for communicating, entertainment, and accessing all kinds of business and government services. But in the process of becoming so crucial, computers have become increasingly locked-down. It's not impossible to tinker with the guts of a computer running Windows or Mac OS, but it's tricky and getting trickier with every new release. It's also risky if you depend on the machine to do your homework. And few kids have the courage to seriously mess with Dad's computer. But parents generally condone this behavior.

The Raspberry Pi offers another path: encouraging experimentation by lowering the cost of accidentally breaking when you're trying to be making. The computer was conceived of by Eben Upton, formerly a lecturer at the University of Cambridge, U.K., who created the Raspberry Pi Foundation to make it a real product. Upton is also a veteran of several years at chip maker Broadcom, designing the kind of chips that make it possible to sell a complete computer for \$35.

### 2. Technical specifications

The following are specifications for Model B+:

- Broadcom BCM2835 SoC processor with 700MHz ARM1176JZF-S core
- 512MB RAM
- Videocore 4 GPU supports up to 1920x1200 resolution
- MicroSD card slot
- 10/100Mbps Ethernet port
- 4 x USB 2.0 ports
- HDMI, audio/video jack
- GPIO header containing 40 pins
- MicroUSB power port providing 2A current supply
- DSI and CSI ports
- Dimensions: 85.6x56mm

The softwares offered are RASPBIAN, PIDORA, OPENELEC, RASPBMC, RISC OS, ARCH LINUX. All these softwares can be downloaded easily and for free from the official forum under the NOOBS(new out of the box software) category.

It provides support for functioning and coding in Python as the main programming language. It also provides support for BASIC, C, C++, JAVA, Perl and Ruby.

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### 3. Booting process

Since the board has been designed with curious school children in mind, it's easy to use. The booting method involves the following steps:

1. Downloading the NOOBS operating system install manager from the official forum of Raspberry Pi.
2. Formatting a microSD card.
3. Burning the NOOBS image onto a microSDcard.
4. Inserting the card into the microSD card slot on the RaspberryPi board.
5. Plugging in keyboard, mouse and monitor cable onto the board and to the monitor.
6. Plugging in the USB power cable.
7. The boot process has now begun and a configuration window appears to enable the camera module if present and setting the date and time.
8. The command line interface loads up asking for the username and password, upon submitting successful information the board is fully operational.
9. The graphical user interface can be chosen by typing startx.
10. Default username and passwords for first boot are: username: pi, password: raspberry.

After the booting process the board can be utilized for any project.

### 4. Adoption

Raspberry Pi is intended to get people interested in computing, coding or even to solve their general needs. School kids, college kids, youngsters, oldies of the technology sphere have all started working on this board and many interesting projects have surfaced. People are inclined to use this board for tinkering, for enhancing everyday experiences like using the FAX machine, innovating Home-robots, media players, video camera streamers. Some of them include

- Pi in the sky: This board is a GPS receiver and radio transmitter designed for tracking high altitude balloon flights.
- R2D2 powered by RaspPi: Xiang's R2D2 tracks faces and motion, is motorized for movement, and has the ability to respond to voice commands.
- Otto: Otto is a camera product that captures pictures with a twist. It converts them into animated GIF's, time lapses, and can added many effects to a picture or to a GIF.
- Livebots: Livebots is a project that allows users to control many robots based on RaspberryPi over the internet.
- Lap pi: The project features a laptop built from scratch based on the Raspberry pi board.

### Conclusions

The authors can write the conclusion as a whole in a paragraph or by making points. An example is given as under.

- 1) Derivatives of the cooling curve can be used to understand the small changes in the undercooling of the liquidus and solidus temperature.
- 2) Thermal analysis is a good technique to control carbides, shrinkage and micro-shrinkage formation.
- 3) It is visibly shown that there is significant reduction in undercooling degree on the alloys and the value of inoculation index was increased. Although the addition of Al,Ca,Zr-FeSi preconditioners gives no significant influence .
- 4) The use of relative performance makes a clear distinction of the alloys efficiency and could be concluded that Ca,RE,S,O-FeSi inoculated iron gave the most influence.
- 5) From the result obtained, it could be deduced comparatively that Ca,RE,S,O-FeSi inoculant give the best efficiency followed by Ca,Zr-FeSi and Ca,Ba-FeSi inoculants respectively.

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