DIGIT MAGAZINE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
Anantha Lakshmi Institute of Technology & Sciences

VOLUME 4 JUL—DEC 2020

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Computer Science and Engineering is at the core of the information age. To prepare our students for the tremendous opportunities in the field, the CSE Department is strongly committed to excellence in both education and research.

Our majors are designed to provide a strong foundation in the core areas of Computer Science and Engineering. Our vibrant graduate programs prepare students for positions in industry and academia. Since its inception, the department has always been recognized for excellence in teaching. The Department provides an outstanding teaching environment complemented by superior teaching for its students to flourish in. Graduates from the department are recruited by both academia and industry.

The Department of Computer Science and Engineering with its cohesive team of faculty members offers a sound program at the UG as well as the PG levels. The curriculum is a blend of the conventional and the radical. It is updated regularly to keep up with the growing demands and the changing trends of the software industry and research laboratories.

DEPARTMENT VISION & MISSION

VISION : To produce technically competent computer science professionals with high quality education in cutting edge technologies and professional ethics.

MISSION :

M1: Impart quality technical education in design and implementation of IT applications through innovative teaching - learning practice.

M2: Provide state-of-art computing infrastructure to enable practical learning experience that foster problem solving and technical communication skills.

M3: Provide quality learning experiences through experiential learning for students and faculty to carry out multidisciplinary research projects with innovative ideas and professional ethics for sustainable development.

PROGRAM EDUCTIONAL OBJECTIVES

PEO 1 : **Demonstrate proficiency in fundamental concepts and advanced technologies of computer science in their careers and/or obtain a higher degree.**

PEO 2 : **Analyze complex computing problems in multidisciplinary area and creatively solve them with analytical decision making and programming skills**

PEO 3 : **Recognize ethical dilemma in work environment and apply professional code of ethics to excel as successful software professional, researcher and entrepreneur.**

PROGRAM SEPCEFIC OUTCOMES

PSO 1 : Apply the knowledge of programming languages, data structures, algorithms and standard software engineering principles to develop viable solutions for complex computing problems.

PSO 2 : Design and develop efficient Web and Mobile based applications under realistic constraints.

PSO3 : Apply theoretical principles of core and advanced computer science to solve engineering

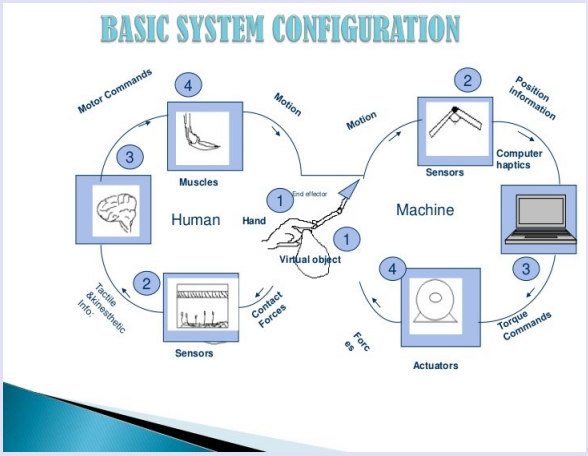
PROGRAM OUTCOMES

PO 1	**Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

HAPTIC TECHNOLOGY

Haptic technology, or haptics, is a tactile feedback technology which takes advantage of a user's sense of touch by applying forces, vibrations, and/or motions upon the user. This mechanical stimulation may be used to assist in the creation of virtual objects (objects existing only in a computer simulation), for control of such virtual objects, and for the enhancement of the remote control of machines and devices.

By using Haptic devices, the user can not only feed information to the computer but can receive information from the computer in the form of a felt sensation on some part of the body. This is referred to as a Haptic interface. 'Haptic Technology and its Application in Surgical Simulation and Medical Training'. PHANTOM is small robot arm with three revolute joints each connected to a computer-controlled electric DC motor. Cyber Grasp is used in conjunction with a position tracker to measure the position and orientation of therefore arm in three- dimensional space. Phantom and Cyber Grasp are Hapic devices.



Haptic Technologies

Haptic: It is the science of applying tactile, kinesthetic, or both sensations to human computer interactions. It refers to the ability of sensing and/or manipulating objects in a natural or synthetic environment using a haptic interface.

Cutaneous: It is used for relating to or involving the skin. It includes sensations of pressure, temperature, and pain.

Tactile: It is used for pertaining to the cutaneous sense, but more specifically the sensation of pressure rather than temperature or pain.

Kinesthetic: It is used for relating to the feeling of motion. It is related to sensations originating in muscles, tendons, and joints.

Force Feedback: It is relating to the mechanical production of information that can be sensed by the human kinesthetic system.

Haptic Communication: It means by which humans and machines communicate via touch. It mostly concerns networking issues.

Haptic Device: It s a manipulator with sensors, actuators, or both. A variety of haptic devices have been developed for their own purposes. The most popular are tactile- based, pen-based, and 3 degree-of-freedom (DOF) force feedback devices.

Haptic interface: It consists of a haptic device and software-based computer control mechanisms.

Haptic perception: The process of perceiving the characteristics of objects through touch.

Haptic rendering: It is the process of calculating the sense of touch, especially force. It involves sampling the position sensors at the haptic device to obtain the user's position within the virtual environment.

Submitted by
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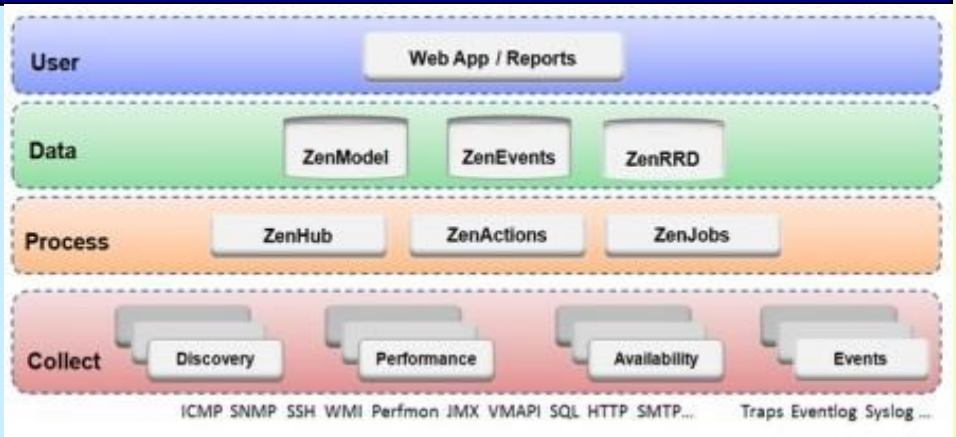
CSE

Zenoss Core



Zenoss (Zenoss Core) is an open source application, server and network management platform based on the Zope application server. Released under the GNU General Public License (GPL) version 2, Zenoss Core provides a web interface that allows system administrators to monitor availability, inventory/ configuration, performance and events. Development of Zenoss Core began in 2002 and in August 2005 the corporate patron of the project Zenoss, Inc. was founded. Zenoss, Inc. sponsors the development of Zenoss Core and sells an enterprise version based on the core version. The Zenoss system provides full stack coverage of networks, servers, applications, services, and virtualization.Functionally, it provides complete operational awareness by combining discover and inventory, availability and performancemonitoring, event management, and reporting. A small number of accessories methods exist to support network and network device management. Access methods include the SNMP, command-line interface (CLIs), custom XML, CMIP, Windows Management Instrumentation (WMI), Transaction Language 1, CORBA, NETCONF, and the Java Management Extensions (JMX).Schemas include the WBEM, the Common Information Model, and MTOSI amongst others.

Medical Service Providers provide a niche marketing utility for managed service providers; as HIPAA legislation consistently increases demands for knowledgeable providers. Medical Service Providers are liable for the protection of their clients confidential information, including in an electronic realm. This liability creates a significant need for managed service providers who can provide secure infrastructure for transportation of medical data.

Why Zenoss Core?

Zenoss Core is a capable open source monitoring solution at no cost. There is Zenoss Enterprise Edition available at a price with more features, including WMI performance monitoring. Before Zenoss, WMI is used to monitor Windows servers and desktops for quite a while, but the challenge for WMI has always been finding a good interface to create reports, graphs, monitor, alert on thresholds, etc. Users used their own scripts combined with tools such as Cacti, Nagios, and even their own web interfaces to manage WMI data. But in zenoss core it come around, creating a ZenPack for Zenoss Core to monitor several key performance counters from Windows servers such as CPU utilization and queue, memory paging and usage, disk IOPS and queue length, terminal sessions and more.

These monitors are completely agentless, unlike many other methods. The challenge with WMI is most stats are not provided as simple SNMP-type counters or gauges, but have to be calculated using two or more properties and often factor in the previous interval's values. The result is a very accurate number, regardless of the time interval between queries. This is why most WMI monitoring scripts you'll find only provide limited performance statistics.

Technology Overview

Zenoss Core combines original programming and several open source projects to integrate data storage and data collection processes with a web-based user interface.

Zenoss Core is built upon the following open source technologies:

• Zope Application server: An object-oriented web server written in Python.

• Python Extensible programming language.

• Net-SNMP: Monitoring protocol that collects systems status information.

• RRDtool: Graph and log time series data.

• MySQL: A popular open source database.

• Twisted: An event-driven networking engine written in Python

Zenoss Core provides the following capabilities:

• Monitoring availability of network devices using SNMP, SSH, WMI

• Monitoring of network services (HTTP, POP3, NNTP, SNMP, FTP)

• Monitoring of host resources (processor, disk usage) on most network operating systems.

• Time-series performance monitoring of devices

• •Supports Nagios plug-in format

Submitted by
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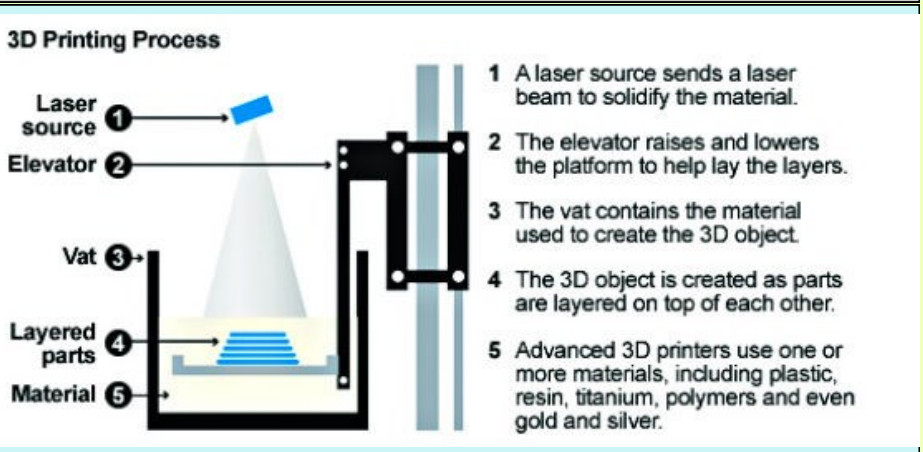
3D Printing

The world of 3D printing has developed in such a way that it disrupts every aspect of conventional product manufacturing. The underlying principles of 3D printing and the printers themselves are moving towards a unified state of turn-key manufacturing limited only by our imagination. The most essential aspect that needs to be understood about 3D printing or 'additive printing' as a personal user tool, is its process. Although there are different ways by which the varied models of 3D printers operate, they're all based on a simple premise. As the term 'additive printing' suggests, 3D printers work by "adding" layers of print material together to create an object. Converting a software -based design into distinct 2D layers or

slices, which are "printed" and bonded to each other in order to create a 3D product is the primary method of operation of any 3D printer. Imagine placing a dot of glue on a piece of paper. Now imagine adding layer upon layer of glue on that dot in a precise and adhesive manner. That dot would grow off the two dimensional page into the third dimension and become a cylinder with the diameter of the original dot. Another example: a single sheet of paper would be two-dimensional but a stack of sheets would make it three-dimensional. In the exact same way, 3D printers create 3D objects by printing layer upon layer of a variety of materials to achieve a three-dimensional product. The overall workflow of any 3D printer is oriented towards achieving the goal of converting a 3D design created using software into a hardcopy version.

From inception to actualization

The 3D printing process of any printer can be simplified into a series of basic steps. These steps are independent of the printer's size, scale, material or design, and are closely adhered to by nearly all printer manufacturers.



Step 1: Just as any 2D digital printing begins as a file in a word processing software or page layout software, 3D printing begins in computer-aided design (CAD) software. The version or degree of the software's complexity may vary but they all share the same basic attribute of being able to design a three-dimensional object inside the computer's memory.

Step 2: The next step on the 3D printing journey is the conversion of the CAD-based models and designs into a language format that's compatible with that of 3D printers - the STL format. The STL format, or 'standard tessellation language' format, is the current industry standard that was developed for the use of 3D printers.

Step 3: The next step will determine how the 3D printer will interpret the STL file design. This is where "Print Properties" comes into the picture. In the same way that we adjust printer properties such as horizontal or vertical orientation when we print a 2D document, we can adjust properties such as size and print orientation of an STL file when printing a 3D design.

Step 4: This step varies according to the type of the printer. Once the STL file is ready for printing, the machines need to be checked for the required materials and placement configurations, just as a paper printer needs to be checked for ink and tray alignment. In the case of 3D printing, the types of machines vary greatly based on their printing techniques, and accordingly require different types of materials to work with.

Step 5: The next step is very easy - the machine proceeds to process the STL file and fabricate the object that's been designed. For most consumer grade 3D printing machines and most designs, the entire printing process is automated. Only in certain rare cases, manual intervention may be called for; E.g. If the printing process requires large material quantities and reloading is necessary or if parts of the design need. The printer creates layers measuring 0.1mm in average thickness.

Step 6: In many cases, the printing process leaves the object's surface hot and malleable, and in certain cases requires additional time to clear off fumes and particulates. Users are advised to take special precautions such as wearing gloves and glasses when removing the object from the printer.

Step 7: The next stage involves processing the item. With most 3D printers, the final object is usually found covered with the remains of the additive materials, or a layer of powder or coarse material.

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Device Mesh

What is The Device Mesh?

As per the Gartner definition "The device mesh is an expanding set of endpoints—mobile, wearable, consumer, home electronics, automotive and environmental devices, including sensors in the Internet of things, that people and businesses will use to reach applications and information or interact with others". In today's world where intelligent interconnected devices are all around us, most human beings are going to be surrounded by data emitting sensors in close concentric loops, which will change the dynamics of communication. These loops create, what we call a Device mesh.

Significance of The Device Mesh

Human life is getting increasingly surrounded by smart devices in various forms – iBeacons in shops, accelerometers, finger print sensors in smart phones and sleep sensors in Fitness bands to name just a few. All these devices don't just connect to the Internet, but also to each other, at least some of them do. A large number of them are actually either collecting data or providing data to us. Highly critical data is being created and transmitted using these devices.

IoT sensors are predicted to grow to 6.4 Billion in 2016, which is 30% more than that in 2015. This has the potential for ubiquitous connectivity – a home connected to a car, a car connected to a tablet, a tablet connected to an office server and to a sensor on a person's body. In such a scenario, the person is always on top of what is happening at his workplace, at his house and even all around him.

How it works?

The device mesh is still an emerging concept and its workings are at present difficult to define. In all probability, its working is going to be akin to any combined set of interconnected devices in an IoT like environment, the only difference being, it will consist of devices directly being used by the consumers. Its working will be largely dependent on what organizations want it to be in a particular situation. An example could befinger print sensors, used for access management and iBeacon technology that allow Mobile Apps to understand their position on a micro-local scale and deliver hyper-contextual content to users based on location.

Evolution of the Device Mesh

The concept of a Device mesh is evolving as we speak. It is evolving as fast as the technologies supporting it, like sensors, connectivity, integration of technologies on a single platform, the changing nature of work, changes in the way we interact and improvement in standards associated with IoT. With every evolving technology or technology concept come business opportunities and changing regulations. It is a very nascent concept but the infrastructure and supporting technologies are available all around us in patches. It is heartening to note though that Gartner believes the device mesh can have a profound impact on organizations.

Enterprises in the Business

Surprisingly, the Device mesh will not be an entirely new playing field with totally new actors. Tech giants like Google, Microsoft and Apple are already poised to take advantage in probably the most conceivable scenarios. Projection standards like Android Auto in cars and may be other vehicles like high end bikes, digital smart assistants like Microsoft's Cortana and Apple's Siri that we have today in smartphones might just be embedded or loaded in car dash boards and bike windshields. These make it possible to automate manual tasks such as taking notes for e-mails, taking directions from the driver or the rider, interacting and conveying meaningful instructions to a washing machine or a fridge (read white goods giants like Bosch, Samsung, Whirlpool) to carry out fairly routine tasks.

Submitted by
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Intelligent RAM

Given the growing processor-memory performance gap and the awkwardness of high capacity DRAM chips, we believe that it is time to consider unifying logic and DRAM. We call such a chip an "IRAM", standing for Intelligent RAM, since most of transistors on this merged chip will be devoted to memory.

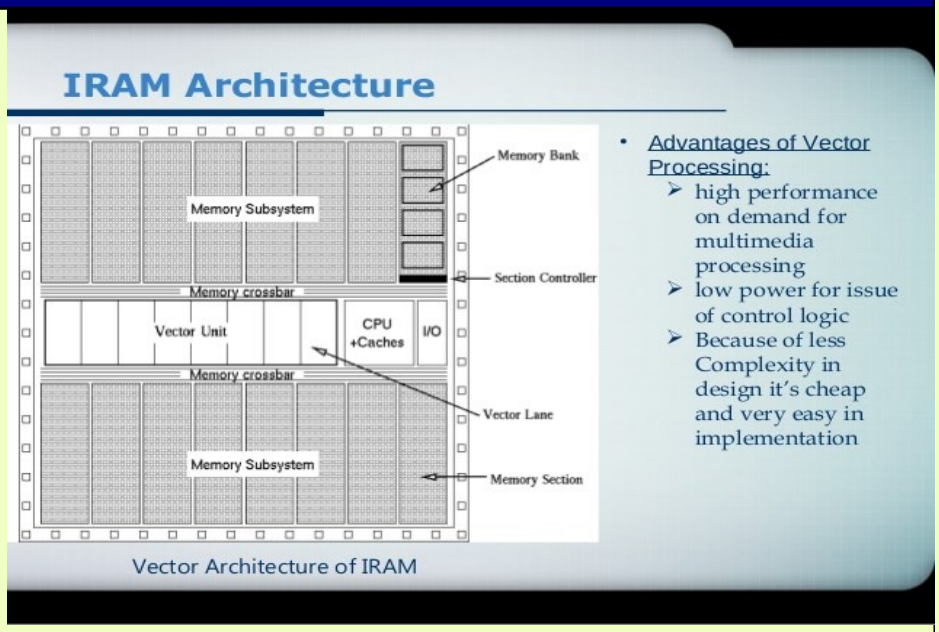
The reason to put the processor in DRAM rather than increasing the on-processor SRAM is that DRAM is in practice approximately 20 times denser than SRAM. (The ratio is much larger than the transistor ratio because DRAMs use 3D structures to shrink cell size). Thus, IRAM enables a much larger amount of on-chip memory than is possible in a conventional architecture.

Although others have examined this issue in the past, IRAM is attractive today for several reasons.

First, the gap between the performance of processors and DRAMs has been widening at 50% per year for 10 years, so that despite heroic efforts by architects, compiler writers, and applications developers, many more applications are limited by memory speed today than in the past.

Second, since the actual processor occupies only about onethird of the die ,the upcoming gigabit DRAM has enough capacity that whole programs and data sets can fit on a single chip. In the past, so little memory could fit onchip with the CPU that IRAMs were mainly considered as building blocks for multiprocessors.

Third, DRAM dies have grown about 50% each generation; DRAMs are being made with more metal layers to accelerate the longer lines of these larger chips. Also, the high speed interface of synchronous DRAM will require fast transistors on the DRAM chip. These two DRAM trends should make logic on DRAM closer to the speed of logic on logic fabs than in the past



Vector Architecture of IRAM

Advantages of IRAM

HIGHER BANDWIDTH.

A DRAM naturally has extraordinary internal bandwidth, essentially fetching the square root of its capacity each DRAM clock cycle; an on-chip processor can tap that bandwidth. The potential bandwidth of the gigabit DRAM is even greater than indicated by its logical organization. Since it is important to keep the storage cell small, the normal solution is to limit the length of the bit lines, typically with 256 to 512 bits per sense amp. 2) Lower Latency.

To reduce latency, the wire length should be kept as short as possible. This suggests the fewer bits per block the better. In addition, the DRAM cells furthest away from the processor will be slower than the closest ones. Rather than restricting the access timing to accommodate the worst case, the processor could be designed to be aware when it is accessing "slow" or "fast" memory. In summary, the access latency of an IRAM processor does not need to be These first two points suggest IRAM offers performance opportunities for two types of applications:

1. Applications with predictable memory accesses, such as matrix manipulations, may take advantage of the potential 50X to 100X increase in IRAM bandwidth; and

2. Applications with unpredictable memory accesses and very large memory "footprints", such as data bases, may take advantage of the potential 5X to 10X decrease in IRAM latency.

MEMORY SIZE AND WIDTH.

Another advantage of IRAM over conventional designs is the ability to adjust both the size and width of the on-chip DRAM. Rather than being limited by powers of 2 in length or width, as is conventional DRAM, IRAM designers can specify exactly the number of words and their width. This flexibility can improve the cost of IRAM solutions versus memories made from conventional DRAMs.

BOARD SPACE.

Finally, IRAM may be attractive in applications where board area is precious --such as cellular phones or portable computers--since it integrates several chips into one.

Submitted by
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Graphical Password Authentication

The most common computer authentication method is to use alphanumerical usernames and passwords. This method has been shown to have significant drawbacks. For example, users tend to pick passwords that can be easily guessed. On the other hand, if a password is hard to guess, then it is often hard to remember. A graphical authentication scheme based on the Hash Visualization technique . In their system, the user is asked to select a certain number of images from a set of random pictures generated by a program . Later, the user will be required to identify the pre selected images in order to be authenticated. The results showed that 90% of all participants succeeded in the authentication using this technique, while only 70% succeeded using text-based passwords and PINS. The average log-in time, however, is longer than the traditional approach. A weakness of this system is that the server needs to store the seeds of the portfolio images of each user in plain text. Also, the process of selecting a set of pictures from the picture database can be tedious and time consuming for the user. obrado and Birget developed a graphical password technique that deals with the shoulder-surfing problem. In the first scheme, the system will display a number of pass-objects (pre-selected by user) among many other objects. To be authenticated, a user needs to recognize pass-objects and click inside the convex hull formed by all the pass-objects. In order to make the password hard to guess, Sobrado and Birget suggested using 1000 objects, which makes the display very crowded and the objects almost indistinguishable, but using fewer objects may lead to a smaller password space, since the resulting convex hull can be large.

Submitted by
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AJAX

Web application designing has by far evolved in a number of ways since the time of its birth. To make web pages more interactive various techniques have been devised both at the browser level and at the server level. The introduction of XMLHttpRequest class in the Internet Explorer 5 by Microsoft paved the way for interacting with the server using JavaScript, asynchronously. AJAX, a shorthand for Asynchronous Java And XML, is a technique which uses this MLHttpRequest object of the browser features plus the Document Object Model and DHTML and provides for making highly interactive web applications in which the entire web page need not be changed by a user action, only parts of the page are loaded dynamically by exchanging information with the server.

This approach has been able to enhance the interactivity and speed of the web applications to a great extent. Interactive applications such as Google Maps, Orkut, Instant Messengers are making extensive use of this technique. Creating Web applications has been considered as one of the most exciting jobs under current interaction design. But, Web interaction designers can't help feel a little envious of their colleagues who create desktop software. Desktop applications have a richness and responsiveness that has seemed out of reach on the Web. The same simplicity that enabled the Web's rapid proliferation also creates a gap between the experiences that can be provided through web applications and the experiences users can get from a desktop application.

In The designers' came up with a technique called AJAX, shorthand for Asynchronous Java And XML, which is a web development technique for creating interactive web applications. AJAX is not a single new technology of its own but is a bunch of several technologies, each ourishing in its own right, coming together in powerful new ways.

What is AJAX?

AJAX is a set of technologies combined in an efficient manner so that the web application runs in a better way utilizing the benefits of all these simultaneously. AJAX incorporates:

1. standards-based presentation using XHTML and CSS;

2. dynamic display and interaction using the Document Object Model;

data interchange and manipulation using XML and XSLT;

4. asynchronous data retrieval using XMLHttpRequest;

5. and JavaScript binding everything together.

Submitted by
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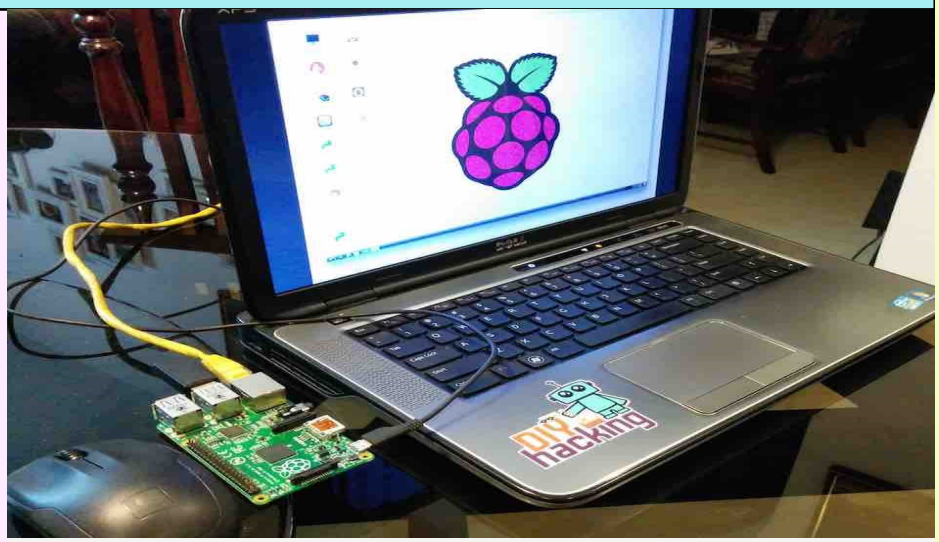
Raspberry Pi

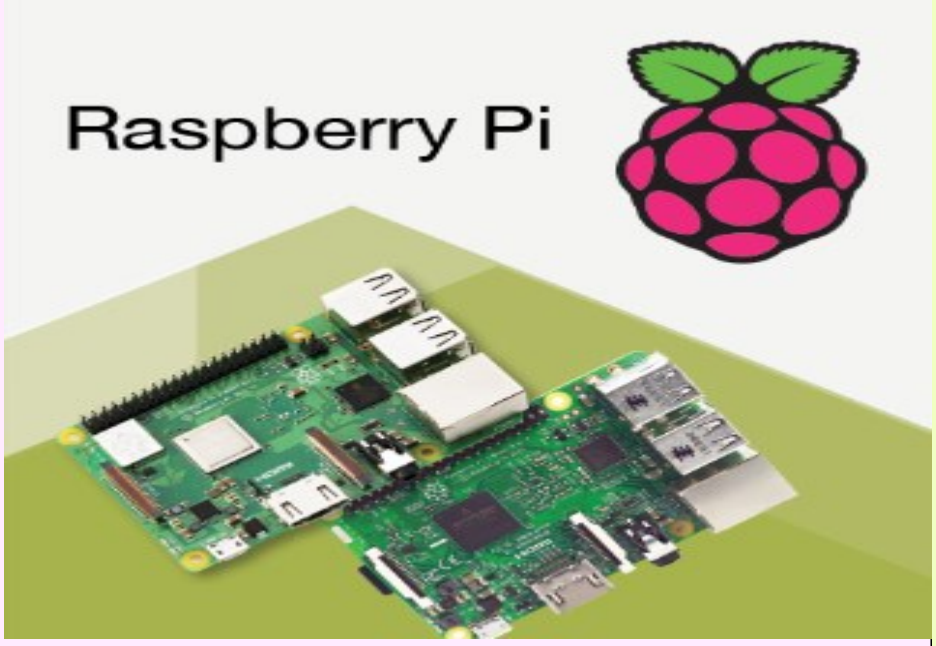


Raspberry Pi is a credit-card sized computer manufactured and designed in the United Kingdom by the Raspberry Pi foundation with the intention of teaching basic computer science to school students and every other person interested in computer hardware, programming and DIY-Do-it Yourself projects.

The Raspberry Pi is manufactured in three board configurations through licensed manufacturing deals with Newark element14 (Premier Farnell), RS Components and Egoman. These companies sell the Raspberry Pi online. Egoman produces a version for distribution solely in China and Taiwan, which can be distinguished from other Pis by their red coloring and lack of FCC/CE marks. The hardware is the same across all manufacturers.

The Raspberry Pi has a Broadcom BCM2835 system on a chip (SoC), which includes an ARM1176JZF-S 700 MHz processor, VideoCore IV GPU and was originally shipped with 256 megabytes of RAM, later upgraded (Model B & Model B+) to 512 MB. It does not include a built-in hard disk or solid-state drive, but it uses an SD card for booting and persistent storage, with the Model B+ using a MicroSD. The Foundation provides Debian and Arch Linux ARM distributions for download. Tools are available for Python as the main programming language, with support for BBC BASIC (via the RISC OS image or the Brandy Basic clone for Linux), C, Java and Perl.

Raspberry Pi being a very cheap computer has attracted millions of users around the world. Thus it has a large user base. Many enthusiasts have created accessories and peripherals for the Raspberry Pi. This range from USB hubs, motor controllers to temperature sensors. There are some official accessories for the RPi as follows: Camera – On 14 May 2013, the foundation and the distributors RS Components & Premier Farnell/Element 14 launched the Raspberry Pi camera board with a firmware update to support it. The Raspberry Pi camera board contains a 5 MPixel sensor, and connects via a ribbon cable to the CSI connector on the Raspberry Pi. In Raspbian support can be enabled by the installing or upgrading to the latest version of the OS and then running Raspi-config and selecting the camera option. The cost of the camera module is 20 EUR in Europe (9 September 2013). and supports 1080p, 720p, 640x480p video. The footprint dimensions are 25 mm x 20 mm x 9 mm.



Gertboard – A Raspberry Pi Foundation sanctioned device designed for educational purposes, and expands the Raspberry Pi's GPIO pins to allow interface with and control of LEDs, switches, analog signals, sensors and other devices. It also includes an optional Arduino compatible controller to interface with the Pi. The Gertboard can be used to control motors, switches etc. for robotic projects.

Applications of RaspBerry Pi

1. Desktop PC
2. Retro Gaming Machine
3. Robot Controller
4. Stop Motion Camera
5. Time Lapse Camera
6. Web Server
7. Inspiring Digital Photo Frame

Submitted by
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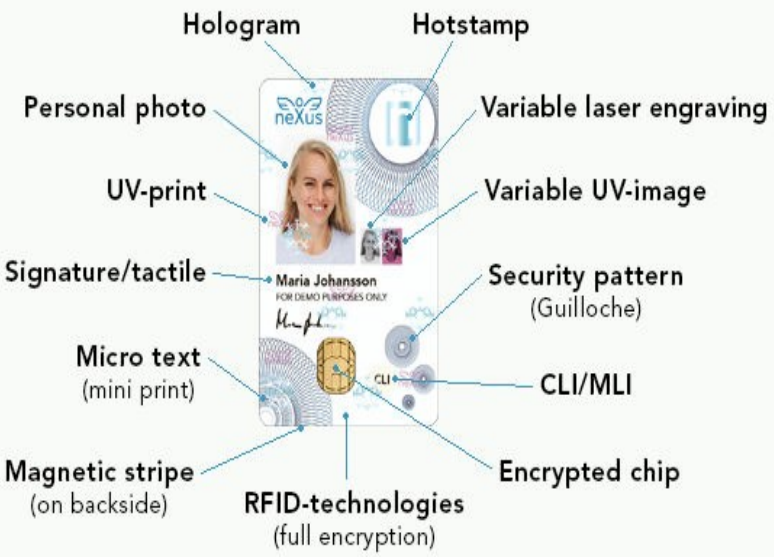
Smart ID

In today's world carrying a number of plastic smart cards to establish our identity has become an integral segment of our routine lives. Identity establishment necessitates a pre stored readily available data about self and to the administrator to authenticate it with claimer's personal information. There is a distinct requirement of a technological solution for nationwide multipurpose identity for any citizen across the board. Number of options has been exercised by various countries and every option has its own pros and cons. However, it has been observed that in most of the cases Smart Card solution has been preferred by a user and administrator both. The use of Smart cards are so prevalent that be it any profession, without incorporating its application, identity of any individual is hardly considered complete.



A smart card is an electronic device with micro-processor based system containing embedded integrated circuits which can process and store a large chunk of data and applications . A smart card reader is used to access the stored information and it is also called smart called terminal when a card is plugged into this reader. Apart from the card reader, radio frequencies are also used to operate a smart card. Different protocols are being used for different types of card readers to communicate between card and the reader. . If we choose to associate any new application with smart card then the security mechanism would require consume more space which in turn necessitates use of lightweight security algorithm.
A hypothetical case of a division integer algorithm is taken and then a viable system has been proposed to ensure appropriate security measures and to combat epidemics of cyber-crimes. In this respect, all the states need stringent legislations with effective law enforcement to prevent any frauds .

ISO standards for smart cards:

A. PHYSICAL CHARACTERISTICS:

Initial ISO standard (ISO 7816-1) in 1987 defined the card size of a smart card as 0.76 mm thick, 53.98 mm height and 85.6 mm wide. It has again been revised in 1998

B. ELECTRONIC CONTACTS:

ISO standard (ISO 7816-2) defined the size and location of the electronic contacts in smart cards. This too has been revised in 1998.

C. ELECTRICAL SIGNALS:

ISO standard (ISO 7816-3) defined transmission protocol along with the nature of electrical signals in smart cards. It has been thrice in 1992, 1994 and 1998.

D. COMMUNICATION PROTOCOLS:

ISO standard (ISO 7816-4) defined the communication protocols in different types of applications and file structure to be stored in these applications in smart cards. It has been revised twice in 1995 and 1998.

Applications

ID VALIDATION:

The basic premise of storing the individual information is to verify him/her for any further uses in smart cards. Currently.

HEALTHCARE:

Professionals from healthcare services are using smart card based applications to gain access for continuous updating of their data and its processing.

SECURE COMPUTER NETWORKS:

A secure access for networks can be assured through digital signatures of a user. They are utilized in granting only specified people to have the access to a particular computer network.

OTHER SMART CARD APPLICATIONS:

Its flexibility and potential to have repository of information supports it in vast number of applications. . A wide range of services which are exploiting the smart card based applications include agricultural products, Life Insurance sector, vending machines, libraries, restaurants, laundry services, set top box facilities, software based games for kids, electronic toll collection, information technology, mass transit, parking facilities, e-passports etc. are just the few names to be counted .

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