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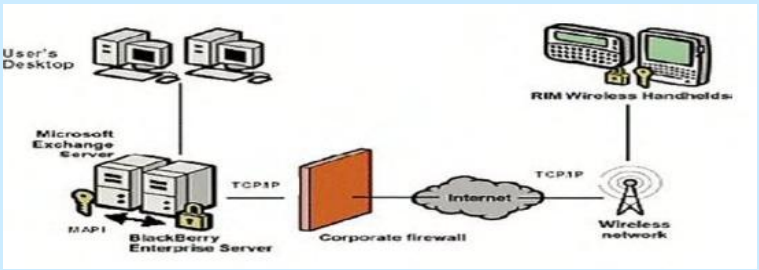
INSIDE THIS ISSUE:

Blackberry Technology

Blackberry handhelds are integrated into an organization's e-mail system through a software package called "Blackberry Enterprise Server "(BES). Versions of BES are available for Microsoft Exchange, Lotus Domino and Novell GroupWise. While individual users may be able to use a wireless provider's e-mail services without having to install BES themselves, organizations with multiple users usually run BES on their own network. Some third-party companies provide hosted BES solutions. Every Blackberry has a unique id called Blackberry PIN which is used to identify the device to the BES. BES can act as a sort of e-mail relay for corporate accounts so that users always have access to their e-mail. The software monitors the user's local "inbox", and when a new message comes in, it picks up the message and passes it to Rim's Network Operations Center (NOC). The messages are then relayed to the user's wireless provider, which in turn delivers them to the user's Blackberry device. This is called "push e-mail," because all new e-mails, contacts and calendar entries are "pushed" out to the Blackberry device automatically, as opposed to the user synchronizing the data by hand. Device storage also enables the mobile user to access all data offline in areas without wireless service. As soon as the user connects again, the BES sends the latest data. An included feature in the newer models of the Blackberry is the ability for it to track your current location through Trilateration.



What is Blackberry Technology?

The recent Blackberry 9000 series has been designed and work on the Intel Xscale 624MHz CPU. The earlier version of Blackberry cell phones worked with an 80MHz processor and were hence comparatively slower in downloading 3G web pages. Blackberry uses an IPD file for its data storage. A single IPD is used for the database handling which makes the performance even faster. The technology encompasses simple features like calendar, reminders and games, along with the basic applications of making and receiving calls and messages. Besides the basic features it also allows you to send emails and browse web pages. The manufacturers have also tied up with various vendors like Microsoft, IBM and Novell to integrate Outlook, Notes and GroupWise into these phones. Almost all the phones manufactured with the Blackberry technology have Bluetooth integrated in them. Some models also have inbuilt cellular 'walkie talkie' feature.

How it works

As we all know, there is always software behind the hardware. This holds true for the blackberry as well. Blackberry Server Software comes in two forms

1)BlackBerry Professional Software (BPS)

2) BlackBerry Enterprise Server (BES)

The The basic steps in receiving an email on a blackberry device are as follows :

1. The email message is sent.

2. Message arrives at your email server (usually the exchange server) and is sent as normal to your PC/ Laptop.

3. The BlackBerry server (the mail is delivered using a "push" concept to the Blackberry Enterprise Server) compresses, encrypts and forwards the message automatically to your BlackBerry handset.

4. Message arrives at the BlackBerry via the Internet and the mobile carrier's network.

5. The Blackberry handheld device receives decrypts and decompresses the email, and alerts the user.

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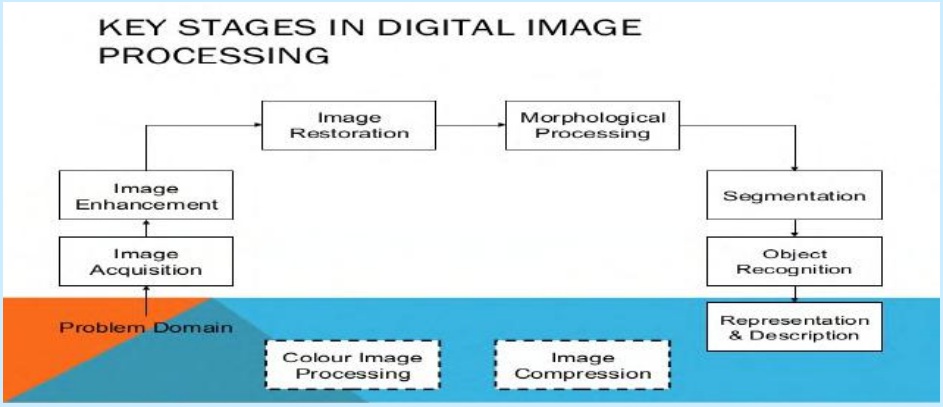
Digital Image Processing

The main feature Digital Image Editing used for altering and improving images in an all most endless number of time. The other features of this technology are Image Size Alteration, Cropping on Image, Removal of Noise and unwanted elements, Image Compression, merging of images and finally color adjustments and finally advantages and disadvantages of digital image processing.

Digital Image Processing is concerned with acquiring and processing of an image. In simple words an image is a representation of a real scene, either in black and white or in color, and either in print form or in a digital form i.e., technically an image is a two-dimensional light intensity function. In other words it is a data intensity values arranged in a two-dimensional form like an array, the required property of an image can be extracted from processing an image. Image is typically by stochastic models. It is represented by AR model. Degradation is represented by MA model.

DIGITAL IMAGE PROCESSING:



Digital image processing is the use of computer to perform on. Digital image processing has the same advantages (over analog image processing) as has (over analog signal processing) -- it allows a much wider range of algorithms to be applied to the input data, and can avoid problems such as the build-up of noise and signal distortion during processing

1. IMAGE ACQUISITION:

An image is captured by a sensor (such as a monochrome or color TV camera) and digitized. If the output of the camera or sensor is not already in digital form, an analog-to digital converter digitizes it.

2. RECOGNITION AND INTERPRETATION:

Recognition is the process that assigns a label to an object based on the information provided by its descriptors. Interpretation is assigning meaning to an ensemble of recognized objects.

3. SEGMENTATION:

Segmentation is the generic name for a number of different techniques that divide the image into segments of its constituents. The purpose of segmentation is to separate the information contained in the image into smaller entities that can be used for other purposes.

4. REPRESENTATION AND DESCRIPTION:

Representation and Description transforms raw data into a form suitable for the Recognition processing.

5. KNOWLEDGE BASE:

A problem domain detailing the regions of an image where the information of interest is known to be located is known as knowledge base. It helps to limit the search.

Other form is orthogonal series expansion. Image processing system is typically non-casual system. Image processing is two dimensional signal processing. Due to linearity Property, we can operate on rows and columns separately. Image processing is vastly being implemented by “Vision Systems” in robotics. Robots are designed, and meant to be controlled by a computer or similar devices. While “Vision Systems” are most sophisticated sensors used in Robotics. They relate the function of a robot to its environment as all other sensors do. “Vision Systems” may be used for a variety of applications, including manufacturing, navigation and surveillance. Some of the applications of Image Processing are:

1. Robotics. 3. Graphics and Animations.

2. Medical Field. 4. Satellite Imaging

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Amazon Alexa

Alexa

Amazon Alexa, known simply as **Alexa**,A companion app is available from the Apple App Store, Google Play, and Amazon Appstore. The app can be used

by owners of Alexa-enabled devices to install skills, control music, manage alarms, and view shopping lists.[24] It also allows users to review the recognized text on the app screen and to send feedback to Amazon concerning whether the recognition was good or bad. A web interface is also available to set up compatible devices is a virtual assistant developed by Amazon, first used in the Amazon Echo and the Amazon Echo Dot smart speakers developed by Amazon Lab126. It is capable of voice interaction, music playback, making to-do lists, setting alarms, streaming podcasts, playing audio books, and providing weather, traffic, sports, and other real-time information, such as news. Alexa can also control several smart devices using itself as a home automation system. Users are able to extend the Alexa capabilities by installing "skills" .

Most devices with Alexa allow users to activate the device using a wake-word other devices require the user to push a button to activate Alexa's listening mode. Currently, interaction and communication with Alexa are only available in English, German, French, Italian, Spanish,[4] and Japanese. In November 2017, Alexa became available in the Canadian market in English only.

Applications of Alexa

Home automation

In the home automation space, Alexa can interact with devices from several manufacturers including Belkin, ecobee, Geeni, IFTTT, Insteon, LIFX, LightwaveRF, Nest , Philips Hue, SmartThings, Wink, and Yonomi. The Home Automation feature was launched on April 8, 2015.Developers are able to create their own smart home skills using the Alexa Skills Kit.

Ordering

Take-out food can be ordered using Alexa; as of May 2017 food ordering using Alexa is supported by Domino's Pizza, Grubhub, Pizza Hut, Seamless, and

Wingstop. Also, users of Alexa in the UK can order meals via Just Eat. In early 2017, Starbucks announced a private beta for placing pick-up orders using Alexa.[42] In addition, users can order meals using Amazon Prime Now via Alexa in 20 major US cities. With the introduction of Amazon Key in November 2017, Alexa also works together with the smart lock and the Alexa Cloud Cam included in the service to allow Amazon couriers to unlock customers' front doors and deliver packages inside.

Music

Alexa supports a multitude of subscription-based and free streaming services on Amazon devices. These streaming services include: Prime Music, Amazon Music, Amazon Music Unlimited, Apple Music, TuneIn, iHeartRadio, Audible, Pandora, and Spotify Premium. However, some of these music services are not available on other Alexa-enabled products that are manufactured by companies external of its services. This unavailability also includes Amazon's own Fire TV devices or tablets.

Alexa is able to stream media and music directly. To do this, Alexa's device should be linked to the Amazon account, which enables access to one's Amazon Music library, in addition to any audiobooks available in one's Audible library. Amazon Prime members have an additional ability to access stations, playlists, and over two million songs free of charge. Amazon Music Unlimited subscribers also have access to a list of millions of songs.

Sports

Alexa allows the user to hear updates on supported sports teams. A way to do this is by adding the sports team to the list created under Alexa's Sports Update app section.

The user is able to hear updates on up to 15 supported teams:

- MLS - Major League Soccer
- EPL - English Premier League
- NBA - National Basketball Association
- NCAA men's basketball - National Collegiate Athletic Association
- UEFA Champions League - Union of European Football Association
- FA Cup - Football Association Challenge Cup
- MLB - Major League Baseball
- NHL - National Hockey League
- NCAA FBS football - National Collegiate Athletic Association: Football Bowl Subdivision
- NFL - National Football League
- German Bundesliga 2nd Division
- WNBA - Women's National Basketball Association
- German Bundesliga 1st Division

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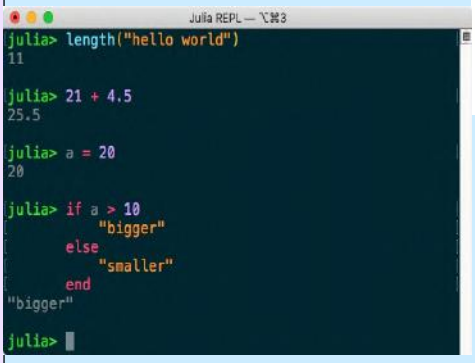
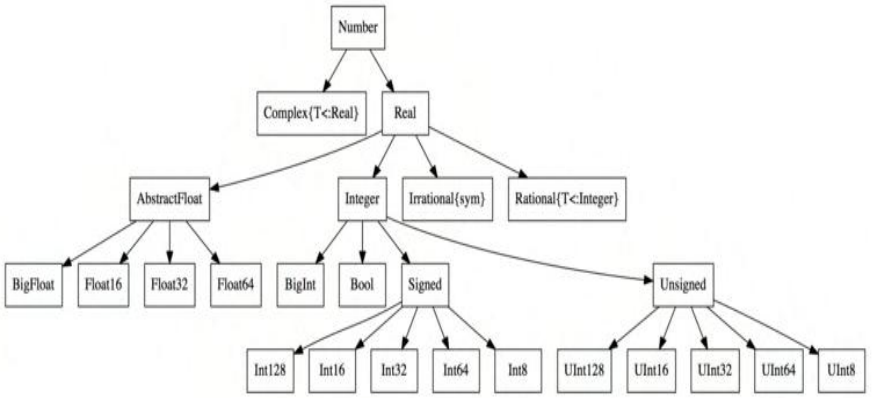
Julia Programming Language

JULIA

Julia is a high-level general-purpose dynamic programming language that was originally designed to address the needs of high-performance numerical analysis and computational science, without the typical need of separate compilation to be fast, also usable for client and server web use, low-level systems programming or as a specification language. Distinctive aspects of Julia's design include a type system with parametric polymorphism and types in a fully dynamic programming language and multiple dispatch as its core programming paradigm. It allows concurrent, parallel and distributed computing, and direct calling of C and Fortran libraries without glue code.





Julia is garbage-collected, uses eager evaluation and includes efficient libraries for floating-point calculations, linear algebra, random number generation, and regular expression matching. Many libraries are available, and some of them (e.g. for fast Fourier transforms) were previously bundled with Julia.

The main features of the language are:

- Multiple dispatch: providing ability to define function behavior across many combinations of argument types
- Dynamic type system: types for documentation, optimization, and dispatch
- Good performance, approaching that of statically-typed languages like C
- A built-in package manager
- Lisp-like macros and other meta programming facilities
- Call Python functions: use PyCall package
- Call C functions directly: no rappers or special APIs
- Powerful shell-like abilities to manage other processes
- Designed for parallel and distributed computing
- Co-routines: lightweight green threading
- User-defined types are as fast and compact as built-ins

- Automatic generation of efficient, specialized code for different argument types

- Elegant and extensible conversions and promotions for numeric and other types

- Efficient support for Unicode, including but not limited to UTF-8

- ***Julia was developed by JeffBezanson, StefanKarpiniski,Viral B. Shah***

History of Julia

Work on Julia was started in 2009, by Jeff Bezanson, Stefan Karpinski, Viral B. Shah, and Alan Edelman, who set out to create a free language that was both high-level and fast. On 14 February 2012 the team launched a website with a blog post explaining the language's mission. Karpinski said of the name "Julia": "There's no good reason, really. It just seemed like a pretty name."Bezanson said he chose the name on the recommendation of a friend. Since the 2012 launch, the Julia community has grown, with over 2,000,000 downloads as of August 2017. The JuliaCon academic conference for Julia users and developers has been held annually since 2014.

Version 0.3 was released in August 2014, version 0.4 in October 2015, and version 0.5 in October 2016. Versions 0.5 and earlier are no longer maintained. Julia 0.6 was released in June 2017, and was the stable release version.

Applications of Julia programming Language

1. There are many Julia packages for web programming, but you might want to use JavaScript with, for client-side web programming.
2. Julia is a multipurpose language geared towards a variety of applications and a larger audience.
3. Julia integrates well with existing programming languages that are popular among developers and data scientists. For example, you can call a C, Python, and R scripts through Julia.

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5G Wireless Technology

Currently, in Network Technology one of the most talked terms is 5G Networks, Although it is well informed that 5G is going to be launch by 2020 but still a lot of buzz about its upcoming features, additional benefits in comparison to 4G, resources required to implement the 5G. 5G will impact the entire Mobile Network and brings in a new era of technology. 5G is going to be more than the next generation Network Technology, it will combine the concept of the Internet of Things. Though it is specified that the 5G Network will be based on the IEEE 802.11 ac standard of broadband technology, but still the formal standard for 5G is yet to propose. The main aim of 5G research and development is to provide a higher speed of internet at a lesser cost, reduce battery drainage, lower latency, to increase the security and connectivity for a large community.

5G simply refers to the next and newest mobile wireless standard based on the IEEE 802.11ac standard of broadband technology. We can say that – 5G Wireless Technology denotes the proposed next major phase of mobile telecommunications standards beyond the current 4G standards. Rather than faster Internet connection speeds, 5G planning aims at a higher capacity than current 4G,

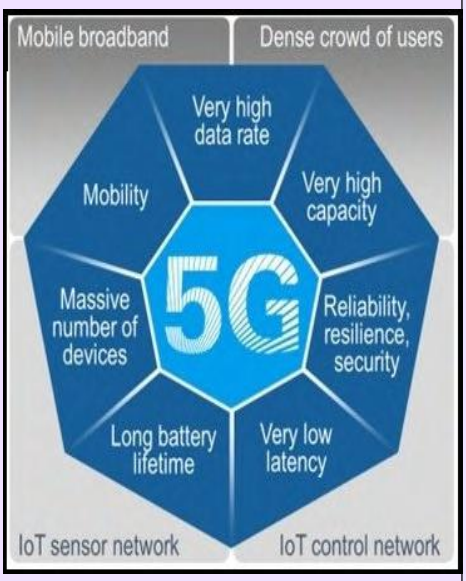
allowing a higher number of mobile broadband users per area unit, and allowing consumption of higher or unlimited data quantities in gigabyte per minute and user. This would make it feasible for a large portion of the population to consume high-quality streaming media many hours per day on their mobile devices, also when out of reach of wifi hotspots. 5G research and development also aim at the improved support of machine to machine communication, also known as the Internet of things, aiming at lower cost, lower battery consumption, and lower latency than 4G equipment.

Although it is too early to decide on what exactly 5G wireless technology is and its offerings, we can conclude on following basic requirements to fulfill 5G Wireless Technology:

- High & increased peak bit rate (Up to 10Gbps connections to endpoints in the field)
- Efficient use of energy in devices
- Larger data volume per unit area (i.e. high system spectral efficiency)
- High capacity to allow more devices connectivity concurrently and instantaneously (100percent coverage)
- More bandwidth
- Lower battery consumption
- Better connectivity irrespective of the geographic region, in which you are
- Larger number of supporting devices (10 to 100x number of connected devices)
- Lower cost of infrastructural development

Higher reliability of the communications (One millisecond end-to-end round trip delay)

The most distinguishing feature of 5G Network is that the network will be based on the User experience, System Performance, enhanced performance, business models and Management & Operations. 5G will utilize the advance access technologies such as Beam Division Multiple Access (BDMA) and Non and quasi-orthogonal or Filter Bank Multicarrier (FBMC) Multiple Access. The new advanced technology called Fog Computing is going to support the 5G development, this will help in achieving the low latency, high mobility, high scalability and real-time execution. 5G Wireless Technology uses UWB (Ultra Wide Band) networks with higher Band Width at low energy levels. Band Width is of 4000 Mbps, which is 400 times faster than today's wireless networks. It uses a smart antenna and CDMA (Code Division Multiple Access). 5G will be the single unified standard for different wireless networks, including LAN technologies, LAN/WAN, WWWW – World Wide Wireless Web, unified IP & seamless combination of broadband. It follows Master Core technology to be operated in parallel multimode including all IP network mode and 5G network mode. In this mode (as shown in the image given below), it controls all network technologies of RAN and Different Access Networks (DAT). Any service mode can be opened under 5G New Deployment Mode as World Combination Service Mode (WCSM). WCSM is a wonderful feature of this technology; for example, if a teacher writes on the whiteboard in a country – it can be displayed on another whiteboard in any other part of the world besides conversation and video. Further, new services can be easily added through parallel multimode service.



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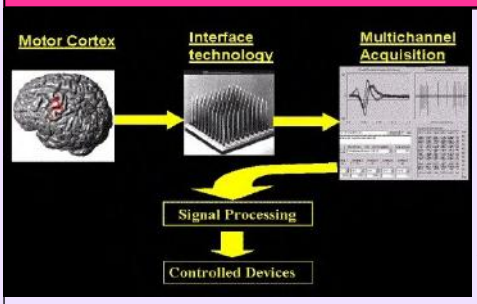
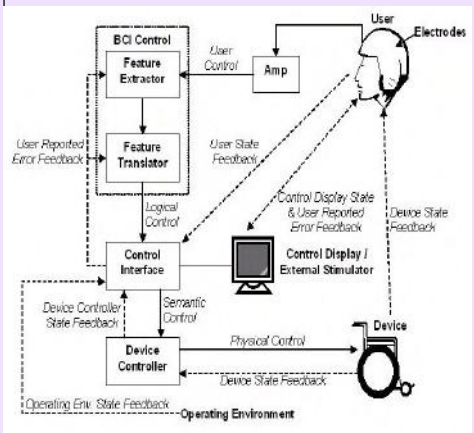
Brain controlled car using Artificial Intelligence



A brain computer interface (BCI), sometimes called a direct neural interface or a brain-machine interface – is a direct communication pathway between a human or animal brain (or brain cell culture) and an external device. In one-way BCIs, computers either accept commands from the brain or send signals to it (for example, to restore vision) but not both. Two-way BCIs would allow brains and external devices to exchange information in both directions but have yet to be successfully implanted in animals or humans. In this definition, the word brain means the brain or nervous system of an organic life form rather than the mind. Computer means any processing or computational device, from simple circuits to silicon chips (including hypothetical future technologies such as quantum computing).



Once the driver (disabled) nears the car. The security system of the car is activated. Images, as well as thermographic results of the driver, are previously fed into the database of the computer. If the video images match with the database entries then the security system advances to the next stage. Here the thermographic image verification is done with the database. Once the driver passes this stage the door slides to the sides and a ramp is lowered from its floor. The ramp has flip actuators in its lower end. Once the driver enters the ramp, the flip actuates the ramp to be lifted horizontally. Then robotic arms assist the driver to his seat. As soon as the driver is seated the EEG (electroencephalogram) helmet, attached to the top of the seat, is lowered and suitably placed on the drivers head. A wide screen of the computer is placed at an angle aesthetically suitable to the driver. Each program can be controlled either directly by a mouse or by a shortcut. For starting the car, the start button is clicked. Accordingly, the computer switches ON the circuit from the battery to the A.C.Series Induction motors.

Bio-control System

The bio-control system integrates signals from various other systems and compares them with originals in the database. It comprises of the following systems:

- Brain-computer interface
- Automatic security system
- Automatic navigation system

Now let us discuss each system in detail.

Brain-computer Interface

Brain-computer interfaces will increase acceptance by offering customized, intelligent help and training, especially for the non-expert user. Development of such a flexible interface paradigm raises several challenges in the areas of machine perception and automatic explanation. The teams doing research in this field have developed a single-position, brain-controlled switch that responds to specific patterns detected in spatiotemporal electroencephalograms (EEG) measured from the human scalp. We refer to this initial design as the Low-Frequency. Asynchronous Switch Design (LF-ASD)

The EEG is then filtered and run through a fast Fourier transform before being displayed as a three-dimensional graphic. The data can then be piped into MIDI compatible music programs. Furthermore, MIDI can be adjusted to control other external processes, such as robotics. The experimental control system is configured for the particular task being used in the evaluation. Real Time Workshop generates all the control programs from Simulink models and C/C++ using MS Visual C++ 6.0. Analysis of data is mostly done within Mat lab environment.

Features

- Remote analysis data can be sent and analyzed in real-time over a network or modem connection.
- Data can be fully exported in raw data, FFT & average formats.
- Ultra low noise balanced DC coupling amplifier.
- Support for additional serial ports via plug-in boar; allows extensive serial input & output control.
- Real-time 3-D & 2-D FFT with peak indicator, Raw Data, and Horizontal Bar displays with Quick Draw mode.
- Full 24 bit color support; data can be analyzed with any standard or user.
- Customized color palettes; color cycling available in 8 bit mode with Quick Draw mode.

- Full Brainwave driven Quick Time Movie, Quick Time MIDI control; user configurable Full Brain wave driven sound control, support for 16 bit sound; user configurable Full image capture and playback control; user configurable.

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Cybercrime Security

We are living in the modern era based on the technology. Our daily life depends on it, live with it. So, nowadays the internet is a common name known to everyone. The Internet contains everything we need. So, people are using and depending on it more and more. As internet usage is increasing day by day, it makes the world small; people are coming closer. Rapid technological growth and developments have provided vast areas of new opportunity and efficient sources for organizations of all sizes. It has become now a national asset, the whole national security is also depending on it. But these new technologies have also brought unprecedented threats with them a cybercrime. Cybercrime is a crime in which a computer is used for the crime like hacking, spamming, phishing etc.

Causes of Cybercrime:

Easy to access – The problem behind safeguarding a computer system from unauthorized access is that there are many possibilities of breach due to the complex technology. Hackers can steal access codes, retina images, advanced voice recorders etc. that can fool biometric systems easily and bypass firewalls can be utilized to get past many security systems.

Capacity to store data in comparatively small space – The computer has the unique characteristic of storing data in a very small space. This makes it a lot easier for the people to steal data from any other storage and use it for own profit.

Complex – The computers run on operating systems and these operating systems are programmed of millions of codes. The human mind is imperfect, so they can do mistakes at any stage. The cyber criminals take advantage of these gaps.

Negligence – Negligence is one of the characteristics in human conduct. So, there may be a possibility that protecting the computer system we may make any negligence which provides a cybercriminal the access and control over the computer system.

Loss of evidence – The data related to the crime can be easily destroyed. So, Loss of evidence has become a very common & obvious problem which paralyzes the system behind the investigation of cybercrime.

Types of Cybercrimes

There are many types of cyber-crimes and the most common ones are explained below:

Hacking: It is a simple term that defines sending an illegal instruction to any other computer or network. In this case, a person's computer is hacked so that his personal or sensitive information can be accessed.

Piracy or Theft: This crime occurs when a person violates copyrights and downloads music, movies, games, and software. There are even peer sharing websites which encourage software piracy and many of these websites are now being targeted by the FBI.

Cyber Stalking: This is a kind of online harassment wherein the victim is subjected to a barrage of online messages and emails. Typically, these stalkers know their victims and instead of resorting to offline stalking, they use the Internet to stalk.

Cyber Terrorism: Cyber terrorism, also known as information wars, can be defined as any act of Internet terrorism which includes deliberate and large-scale attacks and disruptions of computer networks using computer viruses, or physical attacks using malware, to attack individuals, governments and organizations.

Identity Theft: This has become a major problem with people using the Internet for cash transactions and banking services.

Computer vandalism: Computer vandalism is a type of malicious behavior that involves damages computers and data in various ways and potentially disrupting businesses.

Malicious Software: These are Internet-based software or programs that are used to disrupt a network.

How to tackle Cybercrime?

Use Strong Passwords: Use the different password and username combinations for different accounts and resist the temptation to write them down.

Be social media savvy: Be sure to keep your social networking profiles

(Facebook, Twitter, YouTube, etc.) are set to private.

Secure your Mobile Devices: Many people are not aware that their mobile devices are also vulnerable to malicious software, such as computer viruses and hackers. Be sure to download applications only from trusted sources.

Protect your data: Protect your data by using encryption for your most sensitive files such financial records and tax returns.

Protect your identity online: When it comes to protecting your identity online it is better to be too cautious than not cautious enough. It is critical that you be cautious when giving out personal ID such as your name, address, phone number and/or financial information on the Internet.

Keep your computer current with the latest patches and updates: One of the best ways to keep attackers away from your computer is to apply patches and other software fixes when they become available. Protect your computer with security software: Several types of security software are necessary for basic online security.

Call the right person for help: Try not to panic if you are a victim

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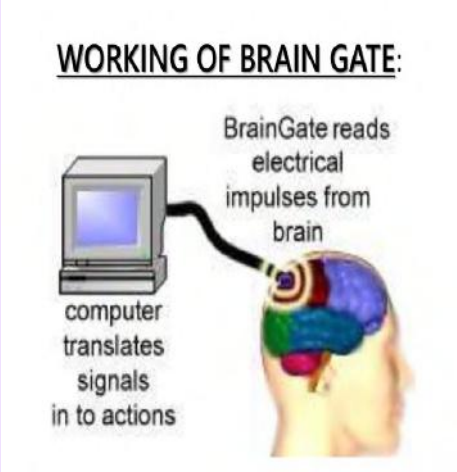
BrainGate Technology

BrainGate is a brain implant system developed by the bio-tech company, Cyber kinetics in conjunction with the Department of Neuroscience at Brown University. The development of the braingate system brain-computer interface is to enable those with severe paralysis and other neuro-



logical conditions to live more productively and independently. The computer chip, which is implanted into the brain, monitors brain activity in the patient and converts the intention of the user into computer commands. Currently, the chip uses about 100 hair-thin electrodes that sense the electro-magnetic signature of neurons firing in specific areas of the brain. The activity is translated into electrically charged signals and is then sent and decoded using a program, which can move a robotic arm, a computer cursor, or even a wheelchair.

Scientists are developing the braingate systems underlying core technology in the neuroport system to enable improved diagnosis and treatment for a number of neurological conditions, such as epilepsy and brain trauma. Braingate will be the first human device that has been designed to record, filter, and amplify multiple channels of simultaneously recorded neural activity at a very high spatial and temporal resolution.

When a person becomes paralyzed, the neural signal from the brain no longer reaches their designated site of termination. However, the brain continues to send out these signals although they do not reach their destination. It is these signals that the brain gate system picks up and they must be present in order for the system to work. It is found that people with long-standing, severe paralysis can generate signals in the area of the brain responsible for voluntary movement and these signals can be detected, recorded, routed out of the brain to a computer and converted into actions enabling a paralyzed patient to perform basic tasks. Scientists are to implant tiny computer chips in the brains of paralyzed patients which could 'read their thoughts'.

Let us understand how the normal neural activity functions:

- Dendrites: Signals sent through dendrites cause chemical changes that result in an electrical signal in the cell body.
- Axons: Nerve impulses are carried through axons away from the neurons cell body.

Neuron muscular junction: The signal is passed by neuron transmitters from synaptic bulbs on the neurons to muscle fibers. The muscle fibers then react to the signal.

Working:

The basic elements of BrainGate are:

1. The chip: A four-millimeter square silicon chip studded with about 100 hair-thin microelectrodes is embedded in the primary motor cortex, the region of the brain responsible for controlling movement.
2. The connector: When the person thinks of moving the computer cursor, electrodes on the silicon chip implanted into the person's brain detect neural activity. His cortical neurons fire in a distinctive pattern, the signal is transmitted through the pedestal plug attached to the skull.
3. The converter: The signal travels to an amplifier where it is converted to optical data and bounced by fiber optic cable to a computer.
4. The computer: Brain gate learns to associate patterns of brain activity with particular imagined movements up, down, left, right and to connect those movements to a cursor.

Advantages of Braingate:

1. BrainGate can remain safely implanted in the brain for at least two years.
2. Later it can safely be removed as well.
3. Spiking from many neurons the language of the brain can be recorded, routed outside the human brain and decoded into command signals.
4. Paralyzed humans can directly and successfully control external devices, such as a computer cursor using these neural command signals.
5. The speed, accuracy, and precision are comparable to a non-disabled person there is no training necessary (just the ability to think of an action).

It is found that people with long-standing, severe paralysis can generate signals in the area of the brain responsible for voluntary movement and these signals can be detected, recorded, routed out of the brain to a computer and converted into actions enabling a paralyzed patient to perform basic tasks.

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