



**Department of
Computer Science &
Engineering**

**Bhai Gurdas Institute of
Engineering and Technology
Sangrur-148001**

2020

Technomantra

Message



Dr. Guninderjit Singh Jawandha
Chairman
Bhai Gurdas Group Of Institutions

From Chairman Desk

I am delighted to have the opportunity to release 'Technomantra', the annual college magazine. In this era of cut throat competition, apart of study, one needs to have the holistic development of personality & this is our prerogative to chisel your thinking & persona here. The magazine will act as a platform for your creativity & writing aptitude & I intently believe that you would have an all round development of your personality during your sojourn in this temple of learning.

I congratulate the Director, staff & students for publishing 'Technomantra'. I hope this issue would be meaningful, enjoyable & memorable in achieving its objectives.

Dr. Gurinderjit Singh Jawandha
Chairman
Bhai Gurdas Group Of Institutions

Message



(Prof) Dr. Tanuja Srivastava
Director
Bhai Gurdas Institute of Engineering & Technology

From Director's Desk

It is a matter of great pleasure for me to learn that Editorial Board is bringing out an issue of the College magazine 'technomantra'. I would like to appreciate those who have contributed articles for the college magazine as this shows the hard work, and the hidden potential of the students.

I hereby congratulate those who contributed for the college magazine and welcome those who want to avail the opportunity next time.

(Prof) Dr. Tanuja Srivastava
Director



Dr. Arun Kumar Singh

(H.O.D)CSE DEPTT.

From Head of Department Desk

I am happy that department of cse is publishing yet another issue of “Technomantra 2021” This magazine is by the student & for the Students. It aims at providing a platform to the students to explore their latent Capabilities & talent, to express their creativity and to develop their technical skills As you scan through the pages of the magazine, It will enlighten you with the important milestone the department has achieved this year. Beside, Our budding talent have expressed their thoughts, ideas, hopes, feelings, aspirations & Convictions in a creative way.

I Congratulate the editorial board for unleashing the hidden potential of the students & appreciate them for their effort in bringing out their issue.

Wishing the magazine a lasting success.

Dr. Arun Kumar Singh (H.O.D)
CSE DEPTT.



Er. Yogesh Kumar
Assistant Prof. CSE DEPTT.

From Editor's Desk

It gives us great pleasure to bring you another issue of Technomantra, the college magazine of Bhai Gurdas Institute of Engineering & Technology. The name and fame of an institute depends on the caliber and achievements of the students and teachers. The role of a teacher is to be a facilitator in nurturing the skills and talents of students. This magazine is a platform to exhibit the literary skills and innovative ideas teachers and students. Technomantra presents the achievements of students and contributions of teachers. We would like to place on record our gratitude and heartfelt thanks to all those who have contributed to make this effort a success. We profusely thank the management for giving support and encouragement and a free hand in this endeavor. Last but not the least we are thankful to all the authors who have sent their articles. We truly hope that the pages that follow will make an interesting read.

Er. Yogesh Kumar
Assistant Prof.
CSE DEPTT.

Vision of the Department:

To be a center of excellence in technical education, research and support services to produce comprehensively trained, innovative Computer Science Engineers of highest quality to contribute to the Nation's development

Mission of the Department:

1. Create an environment of skill learning through faculty training, online learning, sound academic practices and research endeavors.
2. Provide opportunities to promote organizational and leadership skills in students through various extra- curricular and co-curricular events.
3. To uplift innovative research in Computer Science and Engineering to serve the needs of industry, Government and society.
4. Providing social awareness and responsibility in students to serve the Nation and to protect environment.

PEOs

- 1 **Technical Expertise:** Implement domain knowledge of core courses for developing effective computing solutions by incorporating creativity and logical reasoning.
- 2 **Successful Career:** Deliver professional services in the field of Computer Science to respond swiftly to the challenges of 21st century.
- 3 **Soft Skills:** Develop leadership and interpersonal skills with effective communication & time management in the profession.
- 4 **Life Long Learning:** Produce globally competent graduates with moral values and ethics for personal and professional development.

Contents

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What is Block chain technology?

A block chain is a decentralized ledger of all transactions across a peer-to-peer network. Using this technology, participants can confirm transactions without a need for a central clearing authority. Potential applications can include fund transfers, settling trades, voting, and many other issues.

What is cryptocurrency?

Cryptocurrency

Cryptocurrency is a medium of exchange, created and stored electronically in the blockchain, using encryption techniques to control the creation of monetary units and to verify the transfer of funds. Bitcoin is the best known example.



Has no intrinsic value in that it is not redeemable for another commodity, such as gold.



Has no physical form and exists only in the network.



Its supply is not determined by a central bank and the network is completely decentralized.

Blockchain's benefits and unknowns

Benefits



Increased transparency



Accurate tracking



Permanent ledger



Cost reduction

Unknowns



Complex technology



Regulatory implication

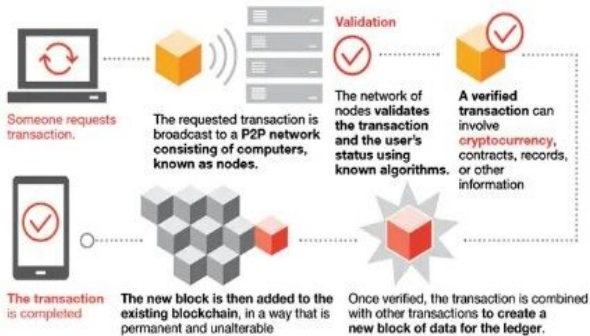


Implementation challenges



Competing platforms

How blockchain works



Blockchain's potential applications

Potential applications



Automotive
Consumers could use the blockchain to manage fractional ownership in autonomous cars.



Financial services
Faster, cheaper settlements could shave billions of dollars from transaction costs while improving transparency.



Voting
Using a blockchain code, constituents could cast votes via smartphone, tablet or computer, resulting in immediately verifiable results.



Healthcare
Patients' encrypted health information could be shared with multiple providers without the risk of privacy breaches.

Blockchain also has potential applications far beyond bit coin and cryptocurrency.

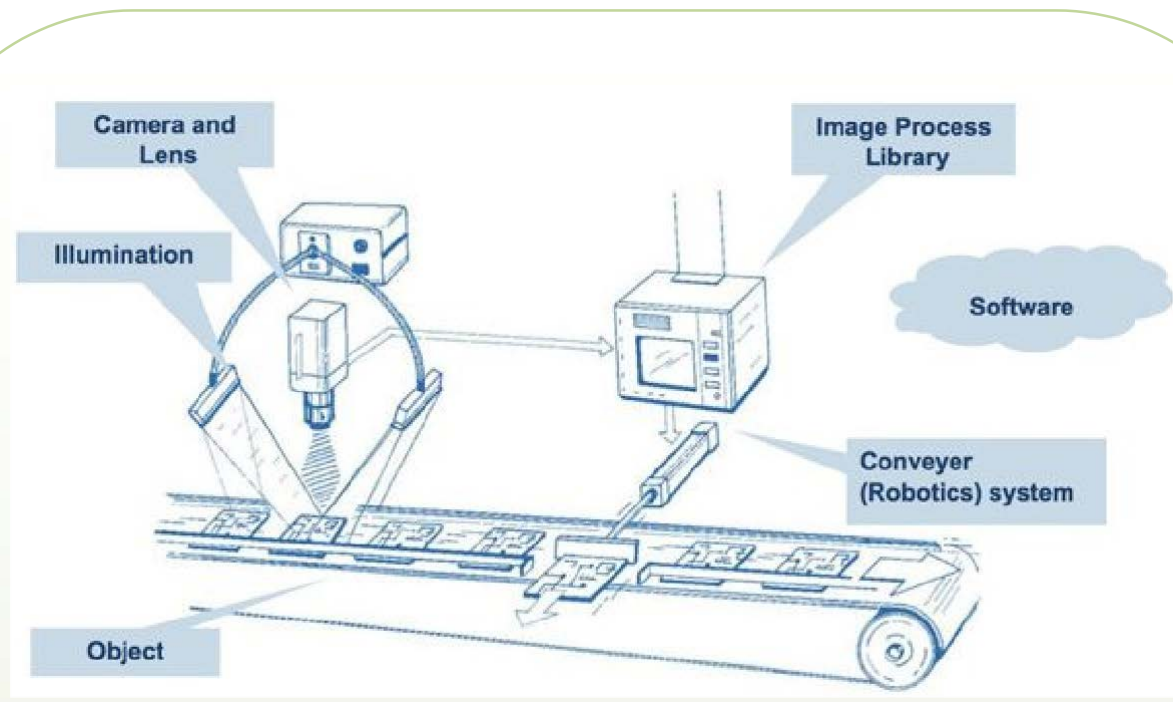
From a business perspective, it's helpful to think of block chain technology as a type of next-generation business process improvement software. Collaborative technology, such as block chain, promises the ability to improve the business processes that occur between companies, radically lowering the "cost of trust." For this reason, it may offer significantly higher returns for each investment dollar spent than most traditional internal investments.

Financial institutions are exploring how they could also use block chain technology to upend everything from clearing and settlement to insurance. These articles will help you understand these changes—and what you should do about them.

For an overview of crypto currency, start with Money is no object from 2015. We explore the early days of bit coin and provide survey data on consumer familiarity, usage, and more. We also look at how market participants, such as investors, technology providers, and financial institutions, will be affected as the market matures.

For a deeper dive into crypto currencies, we recommend that you read the following:

- Carving up crypto provides an overview of how regulators are thinking about crypto currency in financial services, both in the United States and abroad.



Machine vision (MV)

Machine vision (MV) is the technology methods used to provide imaging-based automatic inspection and analysis for such applications as automatic inspection, process control and robot guidance in industry. The scope of MV is broad, MV is related to, though distinct from, comput@vision

While conventional (20 visible light) imaging is most commonly used in MV alternatives include imaging various infrared bands line scan imaging, 30 imaging of surfates and X-ray imaging. Key divisions within MV 2D visible light imaging are monochromatic vs, color, resolution, and whether or not the maging process is simultaneous over the entire image, making it suitable for moving processes. The most commonly used method for 3D imaging is scanning based triangulation which utilizes mation of the product or image during the imaging process. Other 30 methods used for machine vision are time of fight, grid based and stereoscopic.

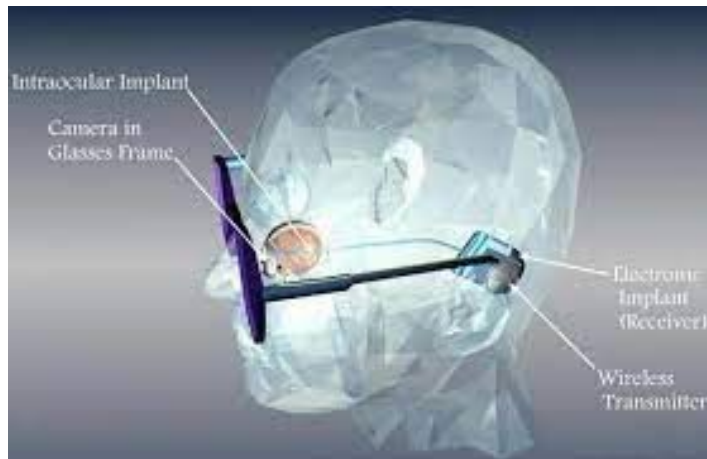
The imaging device (e.g. camera) can either be separate from the main image processing unit or combined with it in which case the combination is generally called a smart camera or smart sensoc. When separated, the connection may be made to specialized intermediate hardware, a frame grabber using either a standardized (Camera Link, CoaXPress) or custom interface, MV implementations also have used digital cameras capable of direct connections (without a framegrabber) to a computer via FireWire, USB or Gigabit Ethernet interfaces.



Flexible Displays

A flexible display is a display which is flexible in nature; differentiable from the more prevalent traditional flat screen displays used in most electronics devices. Colloquially, "display means the thing you see when you look at your phone and navigate around. But more technically, display refers to the electronic material that sits beneath the glass or plastic cover (the part you actually touch) and is responsible for lighting up your phone,

Companies like LG and Samsung have spent years demoing flexible displays that sit on their own outside of any device. In coming days, companies like Samsung will be launching flurry of new Smartphone's with OLED displays. These displays are flexible and unbreakable and also conserve low battery, making them lot more efficient when compared with older Smartphone models. With this durable and new technology, customers can extend their phone life, and most of them will also be water-resistant.



Bionic Eye

Bionic eye, electrical prosthesis surgically implanted into a human eye in order to allow for the transduction of light (the change of light from the environment into impulses the brain can process) in people who have sustained severe damage to the retina.

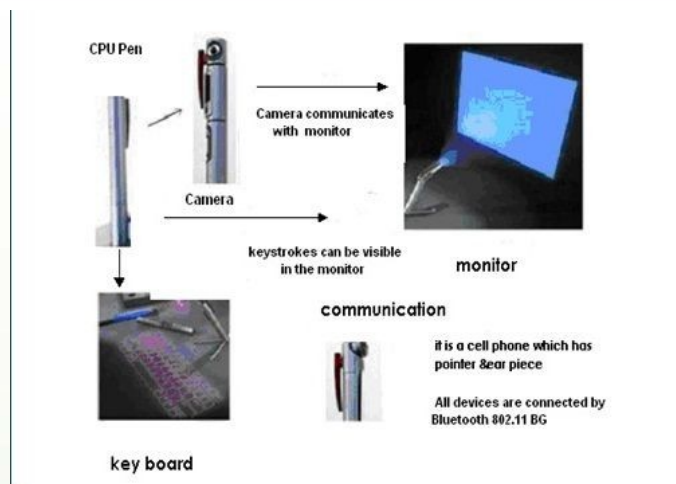
The retina is a light-sensitive tissue layer found within the inner eye that transforms images obtained from the outside world into neural impulses, which are then passed along the optic nerve to the thalamus and ultimately to the primary visual cortex (the visual processing centre), located in the occipital lobe of the brain. People who are most likely to benefit from a bionic eye are middle-aged or elderly with very poor vision associated with age-related macular degeneration (a condition that causes degeneration in the cells found in the centre of the retina) or retinitis pigmentosa (a group of hereditary diseases that destroy photosensitive rod and cone cells in the retina). While the retina is damaged by those diseases, there must be some retinal ganglion cells that remain intact in order for the bionic eye to function as intended. Affected individuals must have been able to see at some point in their lives in order to create the nerve connections in the brain for the device to function. Extensive damage to the optic nerve or visual cortex also renders bionic eye implantation useless.

The bionic eye comprises an external camera and transmitter and an internal microchip. The camera is mounted on a pair of eyeglasses, where it serves to organize the visual stimuli of the environment before emitting high-frequency radio waves. The stimulator microchip consists of an electrode array that is surgically implanted into the retina. That functions as an electrical relay in place of degenerated retinal cells. The radio waves that are emitted by the external camera and transmitter are received by the stimulator, which then fires electrical impulses. The impulses are relayed by the few remaining retinal cells and are transduced as normal to the optic nerve pathway, resulting in vision.

Long Term Evaluation (LTE)

LTE is a standard for wireless data communications technology and an evolution of the GSM/UMTS standards. The goal of LTE was to increase the capacity and speed of wireless data networks using new DSP (digital signal processing techniques and modulations that were developed around the turn of the millennium. A further goal was the redesign and simplification of the network architecture to an IP-based system with significantly reduced transfer latency compared to the 3G architecture. The LTE wireless interface is incompatible with 2G and 3G networks, so that it must be operated on a separate wireless spectrum.

LTE was first proposed by NTT DoCoMo of Japan in 2004, and studies on the new standard officially commenced in 2005. In May 2007, the LTE SAET Initiative started as a global collaboration between vendors and operators with the goal of verifying and promoting the new standard in order to ensure the global introduction of the technology as quickly as possible. The LTE standard was finalized in December 2008, and the first publicly available LTE service was launched by TeliaSonera in Oslo and Stockholm on December 14, 2009 as a data connection with a USB modem. The LTE services were launched by major North American carriers as well, with the Samsung SCH-500 being the world's first LTE mobile phone starting on September 21, 2010 and Samsung Galaxy Indulge being the world's first LTE smartphone starting on February 10, 2011 both offered by MetroPCS and HTC Thunderbolt offered by Verizon starting on March 17 being the second LTE smartphone to be sold commercially in Canada. Rogers Wireless was the first to launch LTE network on July 7, 2011 offering the Sierra Wireless AiCard 313U USB mobile broadband modem, known as the "LTE Rocker stick" then followed closely by mobile devices from both HTC and Samsung. Initially, CDMA operators planned to upgrade to rival standards called UMB and WiMAX, but all the major CDMA operators. The LTE specification provides downlink peak rates of 300 Mbit/s, uplink peak rates of 75 Mbit/s and QoS provisions permitting a transfer latency of less than 5 ms in the radio access network. LTE has the ability to manage fast-moving mobiles and supports multi-cast and broadcast streams. LTE supports scalable carrier bandwidths, from 1.4 MHz to 20 MHz and supports both frequency division duplexing (FDD) and time-division duplexing (TDD). The IP-based network architecture called the Evolved Packet Core (EPC) and designed to replace the GPRS Core Network, supports seamless handovers for both voice and data to cell towers with older network technology such as GSM, UMTS and CDMA2000. The simpler architecture results in lower operating costs.



5 pen PC technology

5 pen PC technology is a computer technology in style of pen. It was developed in 2012 by a Japanese Technology Company, NEC. This technology consists of an input device with input that can be taken from handwriting, a Central Processing Unit, a small projector and a camera along with a mobile phone.

All devices communicate with each other using wireless Technology (Wi-Fi) and it can be connected to mobile phones and other internet connections.

It was developed by Toru Ichihashi. This technology uses 5 pens in making a computer. These work as different parts of a computer such as a CPU, a camera, a virtual keyboard, a projector and a phone. All these are placed on a holder, called base, that holds and charges their batteries. We can get a digital copy of handwritten data and it can even be directly sent as mail.

Working :

Using 5 pen PC technology, monitor and keyboard is produced on a flat surface. The functions of these keyboards and monitors are similar to a normal personal computer (PC). It mostly uses pen (stylus) for input. It uses a special Operating System that supports handwriting recognition. It is a small handheld device.

Functionalities :

It has the following functionalities.

- **CPU pen –**
This is used as computing engine. All processes and calculations are processed here.
- **Communication pen –**
This is used as a mobile phone and pointer. It can also be used as an earpiece that uses Bluetooth for communication.
- **Projector pen –**
This is an LED projector of approximately A4 size with a resolution of 1024×768.
- **Keyboard pen –**
This is a virtual keyboard. It can be projected on any flat surface using 3D IR Sensors.
- **Camera pen –**
This pen is used for clicking pictures, audio and video recordings. It can take 360 degrees of visual.
- The base is actually a holder for 5 pens and also is a charger and acts as a mass storage unit.
It can go upto 6 days. For normal use it would work for 2 weeks.



5G

5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks. 5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices.

5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience to more users. Higher performance and improved efficiency empower new user experiences and connects new industries.

Uses area of 5G

Broadly speaking, 5G is used across three main types of connected services, including enhanced mobile broadband, mission-critical communications, and the massive IoT. A defining capability of 5G is that it is designed for forward compatibility—the ability to flexibly support future services that are unknown today.

Enhanced mobile broadband

In addition to making our smartphones better, 5G mobile technology can usher in new immersive experiences such as VR and AR with faster, more uniform data rates, lower latency, and lower cost-per-bit.

Mission-critical communications

5G can enable new services that can transform industries with ultra-reliable, available, low-latency links like remote control of critical infrastructure, vehicles, and medical procedures.

Massive IoT

5G is meant to seamlessly connect a massive number of embedded sensors in virtually everything through the ability to scale down in data rates, power, and mobility—providing extremely lean and low-cost connectivity solutions.

5G is designed to deliver peak data rates up to 20 Gbps based on IMT-2020 requirements. Qualcomm Technologies' flagship 5G solutions, the Qualcomm® Snapdragon™ X65 is designed to achieve up to 10 Gbps in downlink peak data rates.

But 5G is about more than just how fast it is. In addition to higher peak data rates, 5G is designed to provide much more network capacity by expanding into new spectrum, such as mmWave.

How fast is 5G?

5G can also deliver much lower latency for a more immediate response and can provide an overall more uniform user experience so that the data rates stay consistently high—even when users are moving around. And the new 5G NR mobile network is backed up by a Gigabit LTE coverage foundation, which can provide ubiquitous Gigabit-class connectivity.



Robotic Process Automation

Robotic Process Automation isn't just about robots. It is a lot more about the automation of processes than anything else. Before computers, most processes involved some human intervention. Humans ran even manufacturing machines, and large-scale manufacturing employs thousands of people.

However, since computers have taken over most processes, manufacturing hasn't been left untouched either. All domains, be it manufacturing or information technology, now involve some automation in their processes. The amount of human intervention in these processes is only reducing, and this trend is likely to continue for the foreseeable future.

Jobs in robotic process automation typically involve a significant amount of coding knowledge. You would typically need to write code that would enable computerised or non-computerised processes to be done automatically without human intervention.

These processes could mean anything from automatic email replies to automated data analysis and automatic processing and financial transactions approval. Robotic process automation makes tasks considerably faster for the common consumer by making such approvals automatic based on certain conditions entered by the programmer.

In sectors such as financial services, robotic process automation can reduce the lead time to approve financial transactions online. It improves the productivity of the company as a whole, as well as that of its clients.



Cyber Security

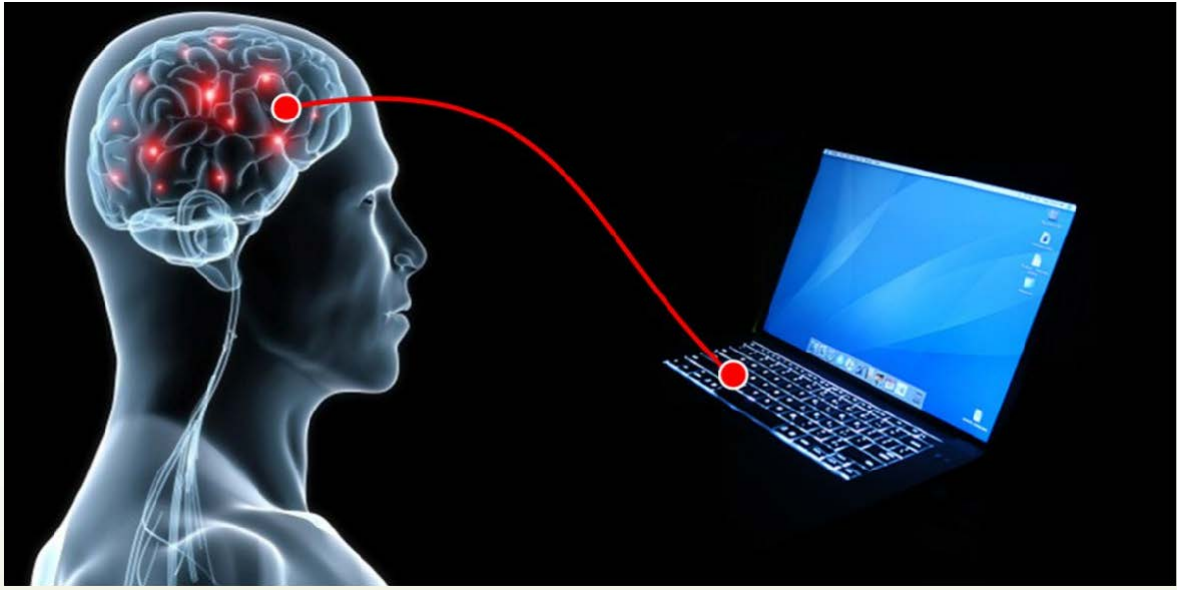
Cyber security might not seem like trending technology, given that it has been around for a while, but it is evolving just as other technologies are. That's in part because threats are constantly new. The malevolent hackers who are trying to illegally access data are not going to give up any time soon, and they will continue to find ways to get through even the toughest security measures. It's also in part because new technology is being adapted to enhance security. As long as we have hackers, cyber security will remain a trending technology because it will constantly evolve to defend against those hackers.

As proof of the strong need for cyber security professionals, the number of cyber security jobs is growing three times faster than other tech jobs. Also, the need for proper cyber security is so high that by 2021, \$6 trillion will be spent globally on cyber security.

You must note that however challenging the field is it also offers lucrative six-figure incomes, and roles can range from

- Ethical Hacker
- Malware Analyst
- Security Engineer
- Chief Security Officer

offering a promising career path for someone who wants to get into and stick with this evergreen trending technology.



Brain-computer interfaces

The ability to control a computer using only the power of the mind is closer than one might think. Brain-computer interfaces, where computers can read and interpret signals directly from the brain, have already achieved Clinical success in allowing quadriplegics, those suffering "locked-in syndrome" or people who have had a stroke to move their own wheelchairs or even drink coffee from a cup by controlling the action of a robotic arm with their brain waves. In addition, direct brain implants have helped restore partial vision to people who have lost their sight.

Recent research has focused on the possibility of using brain-computer interfaces to connect different brains together directly. Researchers at Duke University last year reported successfully connecting the brains of two mice over the Internet (into what was termed a "brain net") where mice different countries were able to cooperate to perform simple tasks to generate a reward. Also in 2013, scientists at Harvard University reported that they were able to establish a functional link between the brains of a rat and a human with a non-invasive, computer-to-brain interface.

In humans, the ability to directly manipulate memories might have an application in the treatment of post-traumatic stress disorder, while in the longer term, information may be uploaded into human brains in the manner of a computer file. Of course, numerous ethical issues are also dearly raised by this rapidly advancing field.