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Technomutation is a departmental journal to publish significant technical information in all the areas of Computer Science & Technology. Published articles in this journal will address important research topics and new technological advancement in this area. The main aim is to motivate students in research works and to increase their knowledge domain. It will give them an opportunity to express their ability of writing technical papers and documentation. The intended audience may submit their research documents half-yearly in the community of scholars, interested in the social impact of new technologies. This Journal was initiated by the Department of Computer Science & Technology students and faculties and cordially supported by the students and faculty members of all other departments.

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Manuscripts are invited from Academician and Students of this Institution for publication considerations. Papers are accepted for editorial considerations through email *cst.tpi@gmail.*com with the understanding that they have not been published, submitted or accepted for publication elsewhere.

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CONTENTS

1.	3D-PRINTING: A MANUFACTURING REVOLUTION	1-2
	Debirupa Banerjee, Nagma Parween, Bristi Mahajan	
2.	BLADE SERVER	3-4
	Suborna Sen, Monalisha Saha	
3.	GENERATIONS OF COMPUTER GAMING	5-7
	Tuhin Das	
4.	HIGH PERFORMANCE GRAPHICS CARD	8-9
	Sayan Ghosh, Dhiraj Malik, Arnab Pal	
5.	GREEN COMPUTING	10-11
	Anwesha Chakraborty, Maharshii Banerjee Thakurta, Angita Bhar	
6.	"LI-FI" – LIGHTING THE FUTURE OF TECHNOLOGY	12-13
	Debirupa Banerjee, Pinki Jana	
7.	FUTURE PROSPECT ABOUT ANIMATION & MULTIMEDIA	14-15
	Moloy Kumar Pan, Subhankar Manna, Subhodeep Das	
8.	PHOTOGRAPHY CONCEPT	16-17
	Tuhin Das, Soumik Banerjee, Debashis Santra	
9.	EVOLUTION OF ANDRIOD	18-19
	Nagma Parween, Bipasha Dutta, Raisa Farhin	
10.	SIXTH SENSE TECHNOLOGY	20-23
	Rajdeep Das, Rajasree Maity, Tanusree Bhar	
11.	VIRTUAL PRIVATE NETWORKING	24-25
	Debirupa Banerjee, Angita Bhar	

3D-PRINTING: A MANUFACTURING REVOLUTION

DCST, 2nd Year

Debirupa Banerjee, 36

Nagma Parween, 16

Bristi Mahajan, 56

INTRODUCTION

Technology has affected recent human history probably more than any other field. Think of a light bulb, steam engine or, more latterly, cars and airplanes, not to mention the rise and rise of the World Wide Web. These technologies have made our lives better in many ways, opened up new avenues and possibilities, but usually it takes time, sometimes even decades, before the truly disruptive nature of the technology becomes apparent.

However, the world of manufacturing has changed, and automated processes such as machining, casting, forming and moulding are all new, complex processes that require machines, computers and robot technology. But, these technologies demand subtracting material from a larger block which results in the waste of 90% of the raw material and this is a serious limitation within the overall manufacturing process. In contrast, 3D printing is a process for creating objects directly, by adding material layer by layer in a variety of ways, depending on the technology used without wastage of resouces.

WHAT IS 3D- PRINTING?

"3D printing is a form of additive manufacturing technology where a three dimensional object is created by laying down successive layers of material".

It is also known as rapid prototyping, is a mechanized method where 3D objects are quickly made on a machine connected to a computer containing blueprints for the object. This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost by eliminating the need to design; print and glue together separate model parts.



HISTORY OF 3D PRINTING

The technology for printing physical 3D objects from digital data was first developed by Charles Hull in 1984 named as Stereo lithography. Other similar technologies such as Fused Deposition Modeling (FDM), Selective Laser Sintering (SLS) were introduced. In 1996, three major products, "Genisys" from Stratasys, "Actua 2100" from 3D Systems and "Z402" from Z Corporation, were introduced. In 2005, Z Corp. launched a breakthrough product, named Spectrum Z510, which was the first high definition color 3D Printer in the market. Another breakthrough in 3D Printing occurred in 2006 with the initiation of an open source project, named Reprap, which was aimed at developing a self-replicating 3D printer.

MANUFACTURING A MODEL WITH THE 3D PRINTER

The model to be manufactured is built up a layer at a time. A layer of powder is automatically deposited in the model tray. The print head then applies resin in the shape of the model. The layer dries solid almost immediately. The model tray then moves down the distance of a layer and another layer of power is deposited inposition, in the model tray. The print head again applies resin in the shape of the model, binding it to the first layer. This sequence occurs one layer at a time until the model is complete.



3D PRINTING TECHNOLOGIES:

- Stereo lithography Stereo lithographic 3D printers (known as SLAs or stereo lithography apparatus) position a perforated platform just below the surface of a liquid photo curable polymer. A UV laser beam then traces the first slice of an object on the surface of this liquid, causing a very thin layer of polymer to harden until a complete object has been printed.
- Fused deposition modelling Here a hot thermoplastic is extruded from a temperature-controlled print head to produce fairly robust objects to a high degree of accuracy.
- Selective laser sintering (SLS) This builds objects by using a laser to selectively fuse together successive layers of a cocktail of powdered wax, ceramic, metal ,nylon or one of a range of other materials.
- **Multi-jet modelling** (MJM)- This again builds up objects from successive layers of powder, with an inkjet-like print head used to spray on a binder solution that glues only the required granules together.
- VFlash printer, manufactured by Canon, is low-cost 3D printer. It's known to build layers with a light curable film. Unlike other printers, the VFlash builds its parts from the top down.
- Desktop Factory is a startup launched by the Idealab incubator in Pasadena ,California.
- Nanofactory 3D printing technologies are introduced that are related to the nanotechnologies.

ADVANTAGES OF 3D PRINTING:

- These machines allow designers and engineers to test out ideas for dimensional products cheaply before committing to expensive tooling and manufacturing processes.
- In Medical Field, Surgeons are using 3d printing machines to print body parts for reference before complex surgeries. Other machines are used to construct bone grafts for patients who have suffered traumatic injuries.
- Architects need to create prototypes of their designs. 3D printing allows them to come up with these models in a short period of time with higher accuracy.
- 3D printing allows artists to create objects that would be incredibly difficult, costly, or time intensive using traditional processes.

FUTURE OF 3D PRINTING

Creating complete models in a single process using 3D printing has great benefits .This innovative technology has been proven to save companies time, manpower and money. Companies providing 3D printing solutions have brought to life an efficient and competent technological product.

BLADE SERVER

Suborna Sen, Computer Science & Technology ,TPI, Hooghly Monalisha Saha, Computer Science & Technology ,TPI, Hooghly

Introduction:

Blade servers are efficient solutions for data centers requiring flexible, high density deployment and management of high performance servers. Blade servers can pack more server performance into less space while reducing cost and complexity, simplifying deployment and management, and improving overall data center performance.

What is Blade Server?

A blade server is a server chassis housing multiple thin, modular electronic circuit boards, known as server blades. Each blade is a server in its own right, often dedicated to a single application. Blade Server technology was developed by a partnership between IBM and Intel. Later, a number of major companies, led by IBM, formed an industry community' in February 2006, with a website base at blade.org.



Figure 1: SERVER BLADE

What is Blade Server Technology?

Blade server technology greatly increases server density, lowers power and cooling costs, eases server expansion and simplifies data center management.

Hardware Part:

- Server Blade.
- Communication Blade.

- Blade Chassis.
- Power and Cooling Systems.
- Storage Systems.

Software Part:

- Software Management Tools.
- Virtualization Software.

BLADE ENCLOSURE:

- ➢ Power.
- ➢ Cooling.
- > Networking.
- ➢ Storage.
- ➢ Connectivity.

ADVANTAGES:

- Reduced space Requirements.
- Reduced Power Consumption.
- Lower Management Cost.
- ➢ Simplified Cabling.
- ➢ Future Proofing.
- Easier Physical Deployment.

DISADVANTAGES:

- Configuration Expenses.
- ➢ Unit Utilization.
- Technology Advancements.
- > Temperature Requirements.

Conclusion:

Blade servers are efficient solutions for data centers requiring flexible, high-density deployment and management of high performance servers. Blade servers can pack more server performance into less space while reducing cost and complexity, simplifying deployment and management, and improving overall data center performance.

GENERATIONS OF COMPUTER GAMING

By DSCT, 2nd year

Tuhin Das (10)

The concept: Humans, we're actually never satisfied with what we have. We probably made games for our entertainment at the stone age, who knows! But, it was only matter of time when we felt a need for more. We concluded visualization in it. A living companion no more was necessary. Our new play mate was digital console and a screen with video output. This is when the term, "Video Games" occurred. Gaming is pure combination of science and art.

Now, video games have two types; Console gaming and computer gaming, we're cutting towards computer gaming directly.

THE DAWN (1952-1977): It all started with a very popular game, "TIC-TAC-TOE" it was called "OXO", developed for EDSAC in 1952. Followed by "SPACEWAR!" developed by MIT students Martin Graetz, Alan Kotok & Steve Russell. The first generation of computer gaming was based on text adventures and interactive fiction. In 1976 Will Crowther developed "Colosall cave adventure"; A text adventure, Later Expanded by Don Woods on 1977.





SPACEWAR!

COLOSALL CAVE ADVENTURE

GRAPHICAL INTERACTION (1970-1980): By this time, graphics was matter in gaming. "Pool of radiance", "Birds Tale" are one of those first graphically interactive games. Gaming was a big deal by now, There were gaming magazine out in the market by some hobbyist group. Which provided Codes, that enables someone to play a game. Microchess was one of the first game which was sold to public, at 1977.

GOLDEN GEN (1980-1990): This was the golden times of gaming, especially computer gaming. As the Adoptions of PAC-MAN, E.T for Atari 2600 (gaming console) grossly underperformed, people lose interest in console gaming, computer gaming market was on high, Well known companies of today, like Electronics Arts (EA, developer of NFS,FIFA) joined the market at this time. Our generation is very close this generation of gaming. Our first games mostly lies within this gen. Games like Donkey kong, Mario Bros., Pac-Man were made at this time.



MARIO BROS.

DONKEY KONG

PAC-MAN

MORDERN AGE(1990-2002): This was the gen of change. New categories of games were introduced; like RPG, FPS etc. The Graphics was the thing that started to change on a huge amount. Software 3D graphics occurred. In this age, on 1994 EA came up with first game of the still ongoing Racing series NFS (Need For Speed) EIDOS released Tomb raider; also a ongoing third person action series; on1996. Online gaming was introduced to the gamers, which opened a new door. Developers were now only focusing on the graphics, It was getting better in every game. This age was put to an end with well known games like Project IGI, GTA Vice City etc.



TOMB RAIDER(1996)NEED FOR SPEED(1994)COUNTER STRIKE(Online Multiplayer)GAMEPLAY REVOLUTION (2003-2008): No new thing was developed in this age. The only
thing that changed rapidly was graphics. The texture and pixels were now developed to look more crisp
and real. Gameplay was the which was far better than ever, they put special effort for the storyline of a
game. Ubisoft caught the market with one of the most epic game, Prince of Persia: Warrior Within (2004)
and started a awesome series, Assassins creed on 2007.



PRINCE OF PERSIA

ASSASSIANS CREED

MAX PAYNE 2

GRAPHICS REVOLUTION (2009-2015): The graphics was extended to whole new level. It was realistic than ever. Almost no game of this age can be played without a decent graphics card. And one more thing that took on the market on this age was interactive game controllers. This the time when the

parallely going upwards industry of Sony playstation came up with a controller that senses your motins and put them into the character. Interesting, right? So componies adapted these things for PC's too. The most known and played games of this age was Batman: Arkham Asylum, Assassins creed 2, Call of duty: Modern Warfare etc.



ASSASSINS CREED 2

X-MEN ORIGINS: WOLVERINE

NEXT GEN (2015-Ongoing): Thing got real in this age. And it has only just begun. Games of this gen concludes the most realistic graphics. The first two game coming up with this next gen graphics was GTA V and Watch Dogs. We are still looking forward to this age.



BATMAN: ARKHAM KNIGHT

BATMAN: ARKHAM ASYLUM

WATCH DOGS

GTA V

Conclusion: Admit it or not. We all love games. Games these days are criticized to be violent, but this give us a window to release the bad within us. But getting addicted to games is not cool. As the Gaming industry is getting bigger every day, future will offer us with more high quality of games and gaming techs. That's for sure.

HIGH PERFORMANCE GRAPHICS CARD

SAYAN GHOSH 2^{nd} year, DCSTROLL-14DHIRAJ MALIK 2^{nd} year, DCSTROLL-12ARNAB PAL 2^{nd} year, DCSTROLL-03

A video card (also called a display card, graphics card, display adapter or graphics adapter) is an expansion card which generates a feed of output images to a display (such as a computer monitor). Frequently, these are advertised as discrete or dedicated graphics cards.

Power demand

As the processing power of video cards has increased, so has their demand for electrical power. Current high-performance video cards tend to consume a great deal of power. For example, the thermal design power (TDP) for the GeForce GTX TITAN is 250 Watts.While CPU and power supply makers have recently moved toward higher efficiency, power demands of GPUs have continued to rise, so the video card may be the biggest electricity user in a computer.Although power supplies are increasing their power too, the bottleneck is due to the PCI-Express connection, which is limited to supplying 75 Watt Modern video cards with a power consumption over 75 Watts usually include a combination of six-pin (75 W) or eight-pin (150 W) sockets that connect directly to the power supply. Providing adequate cooling becomes a challenge in such computers. Computers with multiple video cards may need power supplies in the 1000 W - 1500 W range. Heat extraction becomes a major design consideration for computers with two or more high end video cards.

Size

Video cards for desktop computers come in one of two siz'e profiles, which can allow a graphics card to be added even to small form factor PCs. Some video cards are not of usual size, and are thus categorized as being low profile.Video card profiles are based on width only, with low-profile cards taking up less than the width of a PCIe slot. Length and thickness can vary greatly, with high-end cards usually occupying two or three expansion slots, and with dual-GPU cards -such as the Nvidia GeForce GTX 690- generally exceeding 10" in length.

Multi-card scaling

Some graphics cards can be linked together to allow scaling of the graphics processing across multiple cards. This is done using either the PCIe bus on the motherboard, or, more commonly, a data bridge. Generally, the cards must be of the same model to be linked, and most low power cards are not able to be linked in this way.¹ AMD and Nvidia both have proprietary methods of scaling, CrossFireX for AMD, and SLI for Nvidia. Cards from different chipset manufacturers, architectures cannot be used together for multi card scaling. If a graphics card has different sizes of memory, the lowest value will be used, with the higher values being disregarded. Currently, scaling on consumer grade cards can be done using up to four cards.

Device drivers

The device driver usually supports one or multiple cards, and has to be specifically written for an operating system.

Graphics Processing Unit

A graphics processing unit (GPU), also occasionally called visual processing unit (VPU), is a specialized electronic circuit designed to rapidly manipulate and alter memory to accelerate the building of images in a frame buffer intended for output to a display. Because of the large degree of programmable computational complexity for such a task, a modern video card is also a computer unto itself.



A Radeon HD 7970 with the heatsink removed, showing the major components of the card.

Heat sink

A heat sink is mounted on most modern graphics cards. A heat sink spreads out the heat produced by the graphics processing unit evenly throughout the heat sink and unit itself. The heat sink commonly has a fan mounted as well to cool the heat sink and the graphics processing unit. Not all cards have heat sinks, for example, some cards are liquid cooled, and instead have a waterblock; additionally, cards from the 1980s and early 1990s did not produce much heat, and did not require heatsinks.

Video BIOS

The video BIOS or firmware contains a minimal program for initial set up and control of the video card. It may contain information on the memory timing, operating speeds and voltages of the graphics processor, RAM, and other details which can sometimes be changed. The usual reason for doing this is to overclock the video card to allow faster video processing speeds, however, this has the potential to irreversibly damage the card with the possibility of cascaded damage to the motherboard.

Video memory

The memory capacity of most modern video cards ranges from 1 GB to 12 GB.^[22] Since video memory needs to be accessed by the GPU and the display circuitry, it often uses special high-speed or multi-port memory, such as VRAM, WRAM, SGRAM, etc. Around 2003, the video memory was typically based on DDR technology. During and after that year, manufacturers moved towards DDR2, GDDR3, GDDR4, GDDR5 and GDDR5X. The effective memory clock rate in modern cards is generally between 1 GHz to 10 GHz.

RAMDAC

The RAMDAC, or Random Access Memory Digital-to-Analog Converter, converts digital signals to analog signals for use by a computer display that uses analog inputs such as Cathode ray tube (CRT) displays. The RAMDAC is a kind of RAM chip that regulates the functioning of the graphics card. Depending on the number of bits used and the RAMDAC-data-transfer rate, the converter will be able to support different computer-display refresh rates With VGA standard being phased out in favor of digital, RAMDACs will begin to disappear from video cards.

Green Computing

Anwesha Chakraborty (26) Maharshii Banerjee Thakurta (08) Angita Bhar (02) [DCST 2nd year]

Definition - What does Green Computing mean?

Green computing is the environmentally responsible and eco-friendly use of computers and their resources. In broader terms, it is also defined as the study of designing, manufacturing/engineering, using and disposing of computing devices in a way that reduces their environmental impact.

Many IT manufacturers and vendors are continuously investing in designing energy efficient computing devices, reducing the use of dangerous materials and encouraging the recyclability of digital devices and paper. Green computing practices came into being in 1992, when the Environmental Protection Agency (EPA) launched the Energy Star program.

Green computing is also known as green information technology (green IT).

Explanation: Green computing aims to attain economic viability and improve the way computing devices are used. Green IT practices include the development of environmentally sustainable production practices, energy efficient computers and improved disposal and recycling procedures.

To promote green computing concepts at all possible levels, the following four complementary approaches are employed:

- **Green use**: Minimizing the electricity consumption of computers and their peripheral devices and using them in an eco-friendly manner.
- **Green disposal**: Re-purposing an existing computer or appropriately disposing of, or recycling, unwanted electronic equipment
- **Green design**: Designing energy-efficient computers, servers, printers, projectors and other digital devices
- **Green manufacturing**: Minimizing waste during the manufacturing of computers and other subsystems to reduce the environmental impact of these activities Government regulatory authorities also actively work to promote green computing concepts by introducing several voluntary programs and regulations for their enforcement.

Average computer users can employ the following general tactics to make their computing usage more green:

- Use the hibernate or sleep mode when away from a computer for extended periods
- Use flat-screen or LCD monitors, instead of conventional cathode ray tube (CRT) monitors
- Buy energy efficient notebook computers, instead of desktop computers
- Instead of purchasing a new computer, try refurbishing an existing device

Approaches: In a 2008 article San Murugesan defined green computing as "the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems — such as monitors, printers, storage devices, and networking and communications systems — efficiently and effectively with minimal or no impact on the environment." Murugesan lays out four paths along which he believes the environmental effects of computing should be addressed: Green use, green disposal, green design, and green manufacturing. Green computing can also develop solutions. Modern IT systems rely upon a complicated mix of people, networks, and hardware; as such, a green computing initiative must cover all of these areas as well. A solution may also need to address end user satisfaction, management restructuring, regulatory compliance, and return on investment (ROI). There are also considerable fiscal motivations for companies to take control of their own power consumption; "

Green computing certifications:

Some certifications demonstrate that an individual has specific green computing knowledge, including:

- Green Computing Initiative GCI offers the Certified Green Computing User Specialist (CGCUS), Certified Green Computing Architect (CGCA) and Certified Green Computing Professional (CGCP) certifications.
- **Information Systems Examination Board** (ISEB) Foundation Certificate in Green IT is appropriate for showing an overall understanding and awareness of green computing and where its implementation can be beneficial.
- **Singapore Info com Technology Federation** (SITF) Singapore Certified Green IT Professional is an industry endorsed professional level certification offered with SITF authorized training partners. Certification requires completion of a four-day instructor-led core course, plus a one-day elective from an authorized vendor.
- Australian Computer Society (ACS) The ACS offers a certificate for "Green Technology Strategies" as part of the Computer Professional Education Program (CPEP). Award of a certificate requires completion of a 12-week e-learning course designed by Tom Worthington, with written assignments.
- International Federation of Green ICT and IFG Standard promotes two basic green programs, IFG standard towards Green business and Green Government, and a program designed for professional Green IT certification by IFG.

Green Computing Programmes:

Degree and postgraduate programs that provide training in a range of information technology concentrations along with sustainable strategies in an effort to educate students how to build and maintain systems while reducing its harm to the environment . The Australian National



University. offers "ICT Sustainability" as part of its

information technology and engineering masters programs. Athabasca University offer a similarcourse "Green ICT Strategies", adapted from the ANU course notes by Tom Worthington. In the UK, Leeds Beckett University offers an MSc Sustainable Computing program in both full and part-time access modes.



"LI-FI" – LIGHTING THE FUTURE OF TECHNOLOGY

Debirupa Banerjee, DCST, 2nd Year, 36

Pinki Jana, DCST, 2nd Year, 37

INTRODUCTION

Whether you're using wireless internet(Wi-Fi) in a coffee shop,tealing it from the guy next door, or competing for bandwidth at a conference, you've probably gotten frustrated at the slow speeds you face when more than one device is tapped into the network. As more and more people and their many devices access wireless internet, clogged airwaves are going to make it increasingly difficult to hold onto a reliable signal.

But radio waves are just one part of the spectrum that can carry our data. What if we could use other waves to surf the internet? One German physicist, **DR. Harald Haas**, has come up with a solution he calls "**Data Through Illumination**"—taking the fiber out of fiber optics by sending data through an LED light bulb. Here we can envision a future where data for laptops, smartphones, and tablets will be transmitted through the light in a room.

WHAT IS LI-FI ?

"Light Fidelity or Li-Fi is a Visible Light Communications (VLC) system running wireless communications travelling at very high speeds".

Li-Fi uses common household LED light bulbs to enable data transfer, boasting speeds up to 224 gigabits per second .The term Li-Fi was coined by University of Edinburgh Professor Harald Haas during a TED Talk in 2011. Haas envisioned light bulbs that could act as wireless routers.In simple terms, Li-Fi can be thought



of as a light-based Wi-Fi. That is, it uses light instead of radio waves to transmit information. And instead of Wi-Fi modems, Li-Fi would use transceiver fitted LED lamps that can light a room as well as transmit and receive information.

HOW DOES LI-FI WORK ?

Very simple, if the LED is on, you transmit a digital 1, if it's off you transmit a 0. The LEDs can be switched on and off very quickly, which gives nice opportunities for transmitting data. So what you require at all are some LEDs and a controller that code data into those LEDs. We have to just vary the rate at which the LED's flicker depending upon the data we want to encode.

LI-FI VS WI-FI

Features	Li-Fi	Wi-Fi
Speed	1-3.5 Gbps	54-250 Mbps
IEEE standard	802.15.7	802.11b
Spectrum range	10000 times than WI-FI	Radio spectrum range
Network Topology	Point-to-Point	Point-to-Multi Point
Data Transfer Medium	Use light as a carrier	Use radio spectrum
Frequency Band	100 times of THz	2.4 GHz
Range	10 meters	20-100 meters

APPLICATIONS OF LI-FI OVER WI-FI

- Li- Fi uses light rather than radio frequency signals so are intolerant to disturbances.
- VLC could be used safely in aircraft without affecting airlines signals. Integrated into medical devices and in hospitals as this technology doesn't deal with radio waves, so it can easily be used in all such places where Bluetooth, infrared, Wi-Fi and internet are broadly in use.
- Under water in sea Wi-Fi does not work at all but light can be used and hence undersea explorations are good to go now with much ease.
- Security is a side benefit of using light for data transfer as it does not penetrate through walls.
- On highways for traffic control applications like where Cars can have LED based headlights, LED based backlights, and they can communicate with each other and prevent accidents.
- The issues of the shortage of radio frequency bandwidth may be sorted out by Li-Fi.

CONCLUSION

LI-FI is an emerging technology and hence it has vast potential. A Lot of research can be conducted in this field .Possibilities for future utilization are abundant. There are no dead ends to technology and science. Now both light and radio waves can be used simultaneously to transfer data and signals. Every light bulb can be converted into Li-Fi signal receptor to transfer data and we could proceed toward the cleaner, safer, greener and brighter future



FUTURE PROSPECT ABOUT ANIMATION & MULTIMEDIA

DCST-2nd Year Moloy Kumar Pan,27 Subhankar Manna,30 Subhodeep Das,31

Future Prospects:

Professionals in Animation and Multimedia are highly in demand; NASSCOM, the apex body of IT software and services in India estimates that at least three lakh jobs are currently available in Animation and Multimedia sector. But only those who are multi-skilled can be at an edge.

The industry is throwing up a plethora of opportunities. Satellite television, internet, gaming and crossplatform exploitation are the reasons for this growth. Animation professionals can find great opportunities in the areas of computer animation, film animation, and a wide range of media businesses. Numerous job opportunities are available in India as well as abroad in the exciting field of animation. It opens the door to film industries such as Hollywood, which is the world of special effects and imagery for films.

Animation and multimedia professionals have a variety of lucrative career paths to choose from. Individual career paths depend on their own abilities and aptitudes. They can be texture artists, 3d modellers, riggers or animators. They have opportunities to work in new and emerging platforms such as media convergence, mobile media and online games. Animation is also increasingly being used in edutainment and in interactive CDs, among others.

As a successful graduate of a good multimedia programme, once can apply for positions such as scriptwriter for multimedia, web designer, multimedia producer, computer-based training designer, web script language developer, and more. There are many entry-level career opportunities with corporations, organisations, educational institutions, government agencies, entertainment, and advertising industries.

The remuneration can start with Rs 10,000 per month for a fresher and with experience and proficiency sky can be the limit. Even Rs 10 to 20 lakh per month can be earned. At the top of the hill are jobs such as, Creative Director, Animation Director, VFX Director, Lighting, Modeling and Rigging artists, Production Head, etc. Besides, Mulltimedia designers and animators can also take up freelance projects and work from home.

What is Multimedia Course?

Multimedia is the field related to computer controlled integration of texts, (still or moving images) graphics, drawings, audio and animations. The information/content in the multimedia can be represented through digitally (audio, video and animation) in contrast to traditional media.

Multimedia technology applies interactive computer elements such as text, pictures, video, graphics, animation and sound into a single form to deliver the message.Multimedia presentations may be viewed by person on stage, projected, transmitted, or played locally with a media player. A broadcast may be a live or recorded multimedia presentation.

The multimedia programme enables students to learn how to use computer programmes and create interactive presentations materials. Students are trained in website development software like Cascading Style Sheet or the Adobe Creative Suite, which includes Photoshop, Flash, Illustrator and Dreamweaver.

Besides this, they will also learn design techniques using multimedia technology.

Eligibility Criteria:

Minimum education qualification for a degree and diploma course in animation is plus two or its equivalent from any recognised institution

Graduates from any stream are also eligible to join the post graduation course

Who can Pursue the Course?

Students who are interested in learning about various types of media entertainment and technology such as television, film studies, journalism, video production, interactive media and computer animation can pursue the programme.

The interdisciplinary programme focuses both on emerging trends, technologies and standard methods of managing media.

Courses Offered:

Multimedia course is offered at various levels such as Diploma course, Certificate course, Undergraduate course and Post Graduate course. Community colleges offer associate's degrees in multimedia technology, providing introductory education in the field.

Multimedia technology include some of the following programmes: Interactive media; Website design fundamentals; Electronic imaging; Introductory photography; Animation; Multimedia programming; Graphic design; Digital editing

Programmes offered in graduation: Animation;Communication & Emerging Media; Communication & Technology

Common Job Areas (Designations):

Web Designer/Developer, Multimedia Designer, Software Developer/Programmer, IT Support/Helpdesk,On-line publishing (editorial/design),Multimedia Marketing, Advertising manager, Creative director, Media director, Marketing or promotions manager, Product development manager, Market research manager, Public relations manager, Media analyst or strategist, Multimedia Careers in the Entertainment Industry, Digital Camera Operator, Sound engineering technician, Multimedia artist, Film and video editor, Dubbing editor, Sound effects editor, Audio recording engineer, Game designer,Animator,Game Tester,Multimedia Fine Arts Careers,Photographer,Graphic designer, Multimedia designer, Installation artist



PHOTOGRAPHY CONCEPT

By 2nd year DCST

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WHAT IS PHOTOGRAPY? : Technically speaking, Photo means light and Graphy stands for describing something. As a whole Photography is Art of taking and printing photographs. Question arise what is photograph? Capturing a moment by capturing light with a special device and printing it or showing it digitally is called photograph.

THE DEVICE: Camera. The device that empowers us to capture light. It all started when a convex lens took the reflecting light from an object in front of it and made an upside down image of it on the other end. We had figured it out how to make a similar image but we were still not able to capture it. Then Photographic plates happened. These plates lead the path to photographic films. That's when we started capturing and printing photographs with ease. The 1st gen films contained light sensitive silver halide crystals. When the image was made on the filmstrip the silver halide crystal converts into metallic silver. That's how Black n White photographs were made at the first generation of photography. In the 2nd gen color photography took place when the films were developed with chemicals. The 3rd gen had no films. Everything was digitalized by then. Camera lens was imaging the light on a sensor which was sensing the color and imaging it on a digital storage with the binary codes assigned for those colors. The 4th of camera is DSLR which stands for Digital Single Lens Reflex Camera. It's the upgrade of SLR cameras which took place at the end of the 2nd gen. SLR's could process the image on the film and also gives photographer a view of the photograph through the viewfinder with the help of a mirror installed within. DSLR's do the same thing. They give Photographer the view at the same time it process the picture on the sensor. This gen came up with one more exciting feature. Interchangeable lens. Enabling the option to change the lens of the camera as per photographers need. The 5th and the latest gen of camera is Mirrorless DSLR. The mirror within is not needed anymore. The image on the viewfinder is also processed digitally now.



THE BASICS:

Exposure: In photography, **exposure** is the amount of light per unit area reaching a photographic film or electronic image sensor, as determined by shutter speed, lens aperture and scene luminance. Exposure is measured in lux seconds, and can be computed from exposure value (EV) and scene luminance in a specified region.

This is one of the most important thing and useful thing in photography. In very easy terms; this is the thing which sets the brightness of a photo. This Phenomenon works virtually, It's like editing a picture later, but in this case it's real time and more prominent.

Aperture: as per the dictionary an aperture means an opening, hole or a gap. In photography it stands for the hole in the lens. By changing the aperture photographer can set that how much light will be there in the picture.

Try this physically, open your eye wide; now try to see with smaller eye. You'll definitely notice the change in amount of light. Not only light it affects in focusing on a object to. Try again with your eyes. When they are wide open try to focus on your finger; which should be held at a distance of 3" from your eye, the background is blur, right? Now try the same with smaller eye, less Blur background isn't it? This is how Aperture works.

ISO: This is also a real time virtual effect of a camera. Imagine a pair of glasses helping you to see better in darker environments. ISO enables the camera with the same power.

It makes your camera more light sensitive. But higher sensitivity comes with an expense, It adds grain or "Noise" to the picture. There is always a "Base ISO" of every camera. You should always try to keep ISO at that range to get best out of you camera.

SHUTTER SPEED: Now, I myself find this the most interesting feature of a camera. When you click the button to take a picture the shutter opens and closes again. Shutter speed controls the time for which the shutter will be open and let light hit the sensor or the film. It not only helps to determine the amount of light in a photograph but also have a dramatic impact when a moving object is involved. You can shot a moment which takes just a fraction of second to happen with high shutter speed or shoot a moving object with a low shutter speed and see the magic. Here is an example.



A moving car captured with low shutter speed

CONCLUSION: To describe the technical things of photography, 2 pages aren't enough. And niether it gonna happen to you by only knowing the technial things. It's a art demanding a high amout creativity and intelect. If you can try it some time as hobby, you'll probably love it. And not only hobby one can make serious earnings from photography. So grab your camera and start exploring.

EVOLUTION OF ANDRIOD Dcst,2nd Year NAGMA PARWEEN, -16 BIPASHA DUTTA, -23

RAISA FARHIN, -35

INTRODUCTION:

Android is an operating system for mobile devices. It is mostly used for cell phones, like Google's own Google Nexsus, as well as by other phone manufacturers like HTC and SAMSUNG. It has also been used for tablets such as the Motorola Xoom and Amazon Kindle Fire. Android's kernel is based on linux.

Google says that over 1.3 million Android cell phones are sold every day, making Android the most popular mobile operating system, and also the most popular operating system in general.

It supports multi-tasking and two-dimensional and three-dimensional graphics.

HISTORY OF ANDRIOD:

Android was founded by a company, named Android Inc. in Palo Alto of California, U.S. in 2003 whose founder was **Andy Rubin**.

The first beta version of the Android Software Development Kit (SDK) was released by Google in 2007 where as the first commercial version, Android 1.0, was released in September 2008.

The first commercially available phone to run Android was the **HTC Dream**, released on October 22, 2008 With Android Version 1.0.

FEATURES OF ANDROID:

Programs for Android, also called "apps", come from the Google Play's store. The Android programs have an extension of .apk. Android programs are built in Python, C, C++, or Java programming languages but the UI is always made using Java and XML. There are over 1,600,000 apps available for Android.Itssupports greatfeatures.Some of these are Beautiful UI, Connectivity, Storage, Media support, Messaging, Webbrowser, Multi-touch, Multi-tasking, Resizable widgets, Multi-Language, GCM, Wi-Fi Direct,Android Beam etc.

ANDROID VERSIONS NUMBERS AND NAMES:

Each version of Android has both a number and a name based on a **dessert**. The version numbers and names are:

- Beta versions: Astro and Bender
- 1.5: Cupcake

- 1.6: Donut •
- 2.0 and 2.1: Eclair .
- 2.2: Froyo (FROzenYOgurt) •
- 2.3: Gingerbread •
- 3.x: Honeycomb (a tablet-only version) •
- 4.0: Ice Cream Sandwich •
- 4.1, 4.2 and 4.3: Jelly Bean .
- 4.4: KitKat •
- 5.0 and 5.1: Lollipop •
- 6.0 and 6.0.1: Marshmallow
- 7.0: Nougat •

ANDROID APPLICATIONS:

Android applications are usually developed in the Java language using the Android Software Developer Kit.Once developed, Android applications can be packaged easily and sold out either through a store such as Google Play, Opera Mobile Store, Mobango, F-droidand Amazon App store etc.

ANDROID REVOLUTION IN MARKET SHARE:



Some Marketing Information about android...

SIXTH SENSE TECHNOLOGY

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"Sixth Sense Technology", it is the newest jargon that has proclaimed its presence in the technical arena. This technology has emerged, which has its relation to the power of these six senses. Our ordinary computers will soon be able to sense the different feelings accumulated in the surroundings and it is all a gift of the "Sixth Sense Technology" newly introduced.

Sixth Sense will allow us to interact with our world like never before. We can get information on anything we want from anywhere within a few moments! We will not only be able to interact with things on a whole new level but also with people! One great part of the device is its ability to scan objects or even people and project out information regarding what you are looking at.



Sixth Sense in scientific (or non-scientific) terms is defined as Extra Sensory Perception or in short ESP. It involves the reception of information not gained through any of the five senses. Nor is it taken from any experiences from the past or known. Sixth Sense aims to more seamlessly integrate online information and tech into everyday life. By making available information needed for decision-making beyond what we have access to with our five senses, it effectively gives users a sixth sense.

Earlier SixthSensePrototype



Recent Prototype



> Components

The hardware components are coupled in a pendant like mobile wearable device.

- Camera
- Projector
- Mirror
- Mobile Component
- Color Markers
- > Camera



Figure 1:A webcam captures and recognises an object in view and tracks the user's hand gestures using computer-vision based techniques. It sends the data to the smart phone. The camera, in a sense, acts as a digital eye, seeing what the user sees. It also tracks the movements of the thumbs and index fingers of both of the user's hands. The camera recognizes objects around you instantly, with the micro-projector overlaying the information on any surface, including the object itself or your hand.

> Projector



A projector opens up interaction and sharing. The project itself contains a battery inside, with 3 hours of battery life. The projector projects visual information enabling surfaces, walls and physical objects around us to be used as interfaces. We want this thing to merge with the physical world in a real physical sense. You are touching that object and projecting info onto that object. The information will look like it is part of the object. A tiny LED projector displays data sent from the smart phone on any surface in view–object, wall, or person.

> Mirror



The usage of the mirror is significant as the projector dangles pointing downwards from the neck.

Mobile Component



The mobile devices like Smartphone in our pockets transmit and receive voice and data anywhere and to anyone via the mobile internet. An accompanying Smartphone runs the Sixth Sense software, and handles the connection to the internet. A Web-enabled smart phone in the user's pocket processes the video data. Other software searches the Web and interprets the hand gestures.

> Color Markers



It is at the tip of the user's fingers. Marking the user's fingers with red, yellow, green, and blue tape helps the webcam recognize gestures. The movements and arrangements of these makers are interpreted into gestures that act as interaction instructions for the projected application interfaces.

> Working



- The hardware that makes Sixth Sense work is a pendant like mobile wearable interface
- It has a camera, a mirror and a projector and is connected wirelessly to a Bluetooth or 3G or wifi smart phone that can slip comfortably into one's pocket
- The camera recognizes individuals, images, pictures, gestures one makes with their hands
- Information is sent to the Smartphone for processing
- The downward-facing projector projects the output image on to the mirror
- Mirror reflects image on to the desired surface
- Thus, digital information is freed from its confines and placed in the physical world

> APPLICATIONS

The Sixth Sense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system. The Sixth Sense device has a huge number of applications. The following are few of the applications of Sixth Sense Technology.

- Make a call
- Call up a map
- Check the time

- Create multimedia reading experience
- Drawing application
- Zooming features
- Get product information
- Get book information
- Get flight updates
- Feed information on people
- Take pictures
- Check the email

> ADVANTAGES AND ENHANCEMENTS

> Advantages

- Sixth Sense is an user friendly interface which integrates digital information into the physical world and its objects, making the entire world your computer.
- Sixth Sense does not change human habits but causes computer and other machines to adapt to human needs.
- It uses hand gestures to interact with digital information.
- Supports multi-touch and multi-user interaction.
- Data access directly from machine in real time
- It is an open source and cost effective and we can mind map the idea anywhere
- It is gesture-controlled wearable computing device that feeds our relevant information and turns any surface into an interactive display.
- It is portable and easy to carry as we can wear it in our neck.
- The device could be used by anyone without even a basic knowledge of a keyboard or mouse.
- There is no need to carry a camera anymore. If we are going for a holiday, then from now on wards it will be easy to capture photos by using mere fingers

Future Enhancements

- To get rid of color markers
- To incorporate camera and projector inside mobile computing device.
- Whenever we place pendant- style wearable device on table, it should allow us to use the table as multi touch user interface.
- Applying this technology in various interest like gaming, education systems etc.
- To have 3D gesture tracking.
- To make sixth sense work as fifth sense for disabled person

> CONCLUSION

The key here is that Sixth Sense recognizes the objects around you, displaying information automatically and letting you access it in any way you want, in the simplest way possible. Clearly, this has the potential of becoming the ultimate "transparent" user interface for accessing information about everything around us. If they can get rid of the colored finger caps and it ever goes beyond the initial development phase, that is. But as it is now, it may change the way we interact with the real world and truly give everyone complete awareness of the environment around.

VIRTUAL PRIVATE NETWORKING

DCST, 2ND YEAR

Debirupa Banerjee, 36

Angita Bhar,2

WHAT IS VIRTUAL PRIVATE NETWORK?

A virtual private network (VPN) allows the provisioning of private network services for an organization or organizations over a public or shared infrastructure such as the Internet or service provider backbone network. The shared service provider backbone network is known as the VPN backbone and is used to transport traffic for multiple VPNs, as well as possibly non-VPN traffic. VPNs provisioned using technologies such as Frame Relay and Asynchronous Transfer Mode (ATM) virtual circuits (VC)



have been available for a long time, but over the past few years IP and IP/Multiprotocol Label Switching (MPLS)-based VPNs have become more and more popular.

History of the Virtual Private Network

The term VPN(Virtual Private Networks) is first introduced in telephone company. The purpose is to dial private-patterned (usually short)phone numbers through a public telephone network. Nowadays, the term VPN is mainly used in data transmission context.

It introduces a concept of establishing private network access without requiring owned or leased private network lines. Concretely, it is a communication network tunneled through another network for communication.

You have different ways to perform a tunneling. One way is called encrypted VPN. It uses user data encryption protocol to provide a more secure environment than the standard internet. The alternative is to use tunneling protocol for encapsulation, namely tunneled VPN.

You might use non-tunneled VPN also, policy-based VPN is of this kind. They use access control lists within the router to change the normal routing behavior.

Technologies and Protocols Used to Enable Site-to-Site and Remote Access VPNs :

VPNs, whether provider or customer provisioned, fall into one of two broad categories:

Site to site

• Site-to-site VPNs allow connectivity between an

organization's (or organizations') geographically dispersed sites (such as a head office and branch offices). Figure illustrates a typical site-to-site VPN. There are two types of site-to-site VPN:

• Intranet VPNs—Allow connectivity between sites of a single organization .

• Extranet VPNs—Allow connectivity between organizations such as business partners or a business and its customers Remote access VPNs (also called access VPNs) allow mobile or home-based users to access an organization's resources remotely.



Remote Access

Remote access VPNs (also called access VPNs) allow mobile or home-based users to access an organization's resources remotely.

Conclusion

Internet security and privacy concerns, increasing censorship and rise of geo-restricted websites and applications have tremendously surged the demand for VPNs.

Responding to an increasing demand, VPNs have tugged themselves up in price wars and increasing their offerings like better encryption and security, as well as covering traditionally conservative countries like China and Iran who've been notoriously popular for aliening their cyber space.

Therefore, we can anticipate a really prospective future for VPN business as well as VPN consumers. VPN beyond 2014 is likely to emerge as a product for right balance between security and privacy.

To sum it all, the future of VPN is both promising and exciting in the new age of internet, with governments clearly recognizing it as the only means to separate good eggs from bad ones.