DJCSI

PROTOCOL

VOLUME 10

CSI STUDENT CHAPTER, DJSCE

SVKM

FROM THE PRINCIPAL'S DESK

The CSI student chapter of our college has always taken many initiatives to help the students gain exposure beyond their regular academic curriculum. They have organized various events with great enthusiasm and in a spirit of good team work. The success and enormous scale of the events conducted by DJ-CSI, especially this year, highlights the tremendous growth that DJ-CSI has undergone year after year. This is also underlined by the fact that they were awarded the best CSI student chapter in the country. Keeping with the tradition of Protocol magazine, this year's magazine has expounded upon a myriad of disciplines and technologies. I am sure this will help the aspiring engineers in our college to keep up with the ever-changing technological landscape and contribute to society in many meaningful ways. I hope this magazine will help the students to explore new domains and expand their technical knowledge. I am sure that this edition of Protocol will greatly benefit its readers and I wish the DJ-CSI committee and all its readers all the very best in their future endeavours.

- Dr. Hari Vasudevan,
Principal, DJSCE

FROM THE BRANCH COUNSELLOR'S DESK

Dear students, I am proud to present the 10th volume of Protocol. We take for granted technological advances that were once recognized as a source of pride. They enriched our lives and gave us hope for the future. Engineers are the unsung heroes, responsible for designing and building the systems that govern our everyday. The DJ-CSI committee hopes to help our students contribute to the world in a productive manner. I want to congratulate the DJ-CSI team for their dedication to this committee. I want to thank our Principal, Dr. Hari Vasudevan, Dr. Abhijit R. Joshi (Vice Principal, Acad.), Dr. A. C. Daptardar (Vice Principal, Admin.) for their unwavering support and encouragement, as well as the faculty of IT department.

- Prof. Vinaya Sawant,
Student Branch Counsellor &
Faculty Advisor, DJ-CSI

FROM THE COMPUTER SOCIETY OF INDIA COMMITTEE

In the current atmosphere, heavy with unnecessary politics, it gives me great pleasure to present to the reader, the tenth edition of Protocol, DJ-CSI's annual magazine, with a glimmer of hope that talent, combined with technology, may finally triumph over the persistent negativity. As the organizers of bigger-than-life events and proud winners of the NATIONAL Best Active Student Chapter award, it is our duty to educate the budding engineers on not just technology, but *responsible* technology, and this magazine serves as a fine representation of our dedication to fulfill this duty. We hope the reader enjoys and finds something unique to learn in all the articles!
Happy Reading!

- Zaid Merchant,
Chairperson, DJ-CSI

DJCSI FAMILY

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BE A MUSK-ETEER

So the first article of the last couple of editions of Protocol reiterated the fact that the third year of engineering is a crucial juncture in one's life, and how there is an important decision to be taken -- Engineering or Management? But what I want to ask here is, why choose? Why limit yourself to one role? Why limit yourself at all? Aim high. Be different. Be a Musk-eteer.

Yes, you guessed it right. The title does refer to the man changing the planet(s) faster than we can write articles about him, the man whose work needs no introduction, Elon Musk! He's the man who was once hospitalized by bullies and is now ranked 21st on Forbes' list of the world's most powerful people. The man who coded his own game at the age of 12, selling it for $500, and then went on to create or lead at least nine companies (as of the time of writing this article), and *none* of them coming even remotely close to failure. Essentially, he's a man who we can learn from, at this "crucial juncture" in life.

It's important to realize that a lot of us prefer to remain stagnant, stuck in one stream, stuck in one flow, and that is where the battle is lost. We need an impetus, a driving force, and contrary to Newton's first law, that impetus to counter the inertia has to come from within. There is an inherent fear of *"log kya kahege?"* But we forget the most important entity in this conundrum-- ourselves. Does it really matter what people think if you choose to enroll in a post-graduate program under the Biomedical stream despite having a BE in Computers? Or if you choose to pursue management after you post-grad in Biomedical Engineering after a BE in Computers? As long as you are happy with the choices you make, if you believe you can make a difference this way, it really does not. I mentioned before, that Musk created and sold (at a pretty good price) a computer game at the age of twelve. The flaw in our thinking arises at this point, where we automatically assume he'd have studied further and earned multiple degrees in Computer Science. Fact is, he did not. Musk received two Bachelor's Degrees -- a Bachelor of Science degree in Physics and a Bachelor of Science degree in Economics, not in Computers, *because that is what he thought would help him in the future, to make a difference!* In case this example isn't enough, Elon Musk left a PhD program at Stanford University after just two days to pursue his ambitions as an entrepreneur, and because he believed he could make a difference this way. In case there's any further doubt, I'll mention the obvious -- if

Musk had not been brave enough to make even *one* of the aforementioned decisions, we would not be advancing the way we are. We would be facing backwardness in terms of online payments, solar power, self-driving cars, openly available AI, and of course, no SpaceX. His internal impetus led him to where he is now. Why are you hindering and resisting yours?

Yes, there are certain informal rules which govern the lives of the entire population. Some things will be laughed at, but that should not stop you from being what you want to be, achieving what you want to achieve. Live without those restrictions and choose what you feel is correct. I'm not advocating that you go against the flow. I'm advocating that you create your own. There is no need to do precisely what your senior did. Sure, you should definitely learn from his mistakes, but you needn't blindly follow anyone. Walk your own path, select your own field of interest, and you'll be the happiest you have been. It's not just about computer engineering vs management,

it's also about the different fields in computers itself. Now is the time to explore what you would love to do all your life, but even then, at no point should you be afraid to try something new and different. Never be afraid to pivot. Sure, you can and should listen to the advice that others may have for you, but do not let anyone's opinion cloud your own judgements. And lastly, don't back away from sailing untested waters. Nobody thought I, as a Computer Engineering student, could become the chairperson of

DJ-CSI. But I did. Nobody thought I could become a TEDx Licensee to host the college's first TEDx event. But I did. Nobody thought I could get the approval of, and successfully pull off, one of SVKM's first overnight event (Codeshastra 3.0) with a twenty member team. But I did. Nobody thought I could write all of this in my article. Well...

"I think it's possible for ordinary people to choose to be extraordinary."

ZAID MERCHANT
TE COMPUTERS

FUTURE TRENDS OF IT

The IT industry is burgeoning and the technological landscape is constantly changing. From computer graphics to machine learning and IOT to cloud computing, the advancements are meteoric. We can expect to see some path breaking developments from each of these disciplines in the coming years.

We have all heard of machine learning, a discipline that has been rapidly advancing in leaps and bounds. It's soon expected to create an "Algorithm economy". An economy where developers can produce, distribute and commercialize their code. The algorithm economy is not about buying and selling complete apps but rather functional, easy to integrate algorithms that enable developers to build smarter apps, quicker and cheaper than before. The algorithm economy also allows for the commercialization of world class research that historically would have been published but largely under-utilized. Algorithm marketplaces will function as the global meeting place for researchers, engineers and organizations to come together and make tomorrow's apps today.

Large, computationally intensive machine learning algorithms can only be made less intimidating by using cloud services. The cloud has shifted from being a driver of cost savings to a key enabler of business innovation. Every day we see more and more companies adopt cloud, we see CIOs crafting well-thought-out strategies that include cloud. The hybrid cloud—a mix of, on and off premises—offers the best of both worlds. As enterprise data volumes continue to swell, hybrid clouds enable organizations to combine and analyse data streams coming from various locations.

They seamlessly connect all of an organization's clouds as well as outside data sources (weather, social media etc.) to work as one. A recent Synergy report states that spend on private and hybrid cloud services is growing at 45 percent per year. On the other hand cognitive computing, is a simulation of human thought processes in a computerized model. It involves self-learning systems that use data mining, pattern recognition and natural language processing to mimic the way the human brain works. Driven by the growing demands of the enterprise, hybrid cloud platforms that combine data analytics and cognitive computing will be increasingly critical for enabling innovation in the digital world. Those enterprises that don't support the shift to hybrid but look for ways to exploit it, will succeed, grow and have a leg

up on the competition.

Meanwhile, in the world of graphics, current graphics rendering is solely based on polygon rendering. Experts have speculated that had monitor resolutions not increased as rapidly as they did, real time graphics processing might have gone down a different route because the efficiency of polygon rendering was the best way to keep up with these increasing resolutions. Unfortunately, we still lack the processing power to render photorealistic graphics in real time at the necessary resolutions. This is where light simulation comes in.

A simulation of light would ideally use materials and material properties rather than artistically rendered textures and simple properties. We are slowly approaching this scenario. The world of, The Vanishing of Ethan Carter was created by using real photographs, constructing point clouds and then converting them into polygons and textures. This results in a far more realistic simulation and could revolutionise the world of game development and animation.

And the application most likely to dominate

2017 is the Internet of Things, the connection of millions of ordinary devices, from cameras to kettles with the internet. 2017 could be the year we'll all be telling our coffee machine at home to prepare us a chocolate fudge from five miles away, using a bespoke interface in our car as we're driving home. Or perhaps not. But this ethos of interconnectivity is already reaching the realm of artificial intelligence with Cloud Robotics.

The robots use the cloud to share data, enabling it to be analysed by any other robot or intelligence system, also connected to the same network. One robot teaches something to another, who in turn develops it and passes it forward in a collaborative effort that could massively increase the learning potential and connectivity of machines.

All of these trends come together for our final 2017 prediction: the rise of humanised digital technology in the form of intelligent personal assistants. These are essentially human-emulating data hubs. They use advances in artificial intelligence to capture and interpret our data, the Internet of Things to operate everything around us and the advances in augmented reality to project themselves convincingly into our mobile world. It is the next iterative step for the likes of Siri, Cortana and Alexa: an intelligent assistant who is able to travel with us wherever we go, across every device we use, to assist us in nearly every aspect of our lives. Thus making our lives easier and the future a more exciting place to look forward too.

SAGAR , PRUTHA , SHWETA
TE COMPUTERS AND TE IT

DEEP LEARNING

Have you ever wondered how the app Prisma turns your photos into stylized artworks based on different graphical styles? How does the IOS 10's Polarr feature segregate folders depending upon the person's photo? How does the RETINA SCAN work? The answer to all these questions is DEEP LEARNING. Deep Learning is an aspect of artificial intelligence (AI) that is concerned with emulating the learning approach that human beings use to gain certain types of knowledge. It promises general, powerful, and fast machine learning, moving us one step closer to AI. The human brain works according to deep learning, though you may not be aware of your own brain performing those intermediate steps before coming up with the result. DL can be used in the fields of Robotics, medicines, Artificial Intelligence, etc.

MACHINE LEARNING VS DEEP LEARNING

Deep Learning is a technique within Machine Learning. Think of machine learning as a black box. "Reality" goes into it as a bunch of data, and comes out as a simplified version of that data. Analysts study this output and may tweak the internals of the black box fine tune the results.

There are several internal levels to the black box, giving intermediate interpretations. Analysts can adjust those intermediate levels. This may make the whole process more efficient at producing the desired result.

Imagine you are walking along a path and you think you spotted a snake. Maybe, your eyes deceived you, and you realise that it's just a tree root.
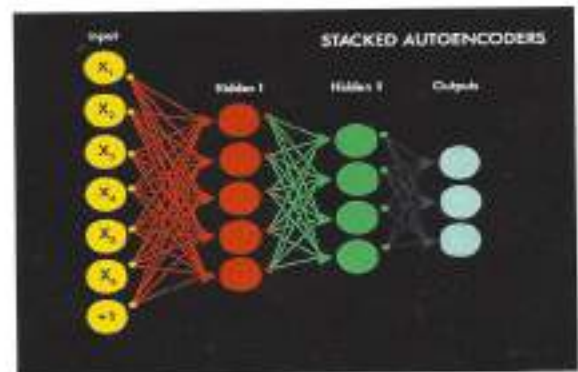
How might a machine be programmed to do that? With DL, the process would first discern whether the shape is on the ground or up in the sky. If it's on the ground, it's more likely to be an animal. Next, is it moving? If it's moving, then it's a lot more likely to be an animal. This process continues iteratively. This is an intelligent process, in which what you perceive is influenced by what you expect given the context. In the blink of an eye you've unconsciously made layers of assessment that add up to "snake! look out!" or "just a root, don't trip".

Our brain is an interconnection of millions of neurons that develop with time and our brains become powerful enough to recognize and visualize objects. DL works on the same grounds which use techniques inspired by the human brain's ability to learn. Thus DL uses Artificial Neural

DNetworks(ANN) to make machines learn various levels of abstraction and solve real world problems.

ANN consists of multi-layer systems. The INPUT LAYER accepts the inputs from the environment, which are captured by the sensors. There are number of HIDDEN LAYERS, which are mainly involved in data abstraction from the raw inputs. The OUTPUT LAYER gives the output.
Consider the example of a FACIAL RECOGNITION SYSTEM.
The first layer may look for simple edges. The next might look for collection of edges that form shapes like rectangles or circles. The third may identify these shapes as eyes or a nose. After 5 or 6 layers, the ANN puts all of them together to form simple objects or even faces. ANNs have already proved their worth in handling images, but now they are being applied to all kinds of other datasets like raw text, numbers etc.

GPU (GRAPHICS PROCESSING UNIT) for DEEP LEARNING
GPUs increase the computation speed of ANN and thus they can learn quickly. DL involves a large number of matrix multiplications and other operations which can be massively parallelised and thus, sped up on GPUs. Consider the Finger Print Scanner:
The scanner learns to recognize your fingerprint within seconds. It even works when you place your finger in different orientation or even inverted. Had a CPU been used, it would have taken some minutes to completely learn the finger print.

APPLICATIONS OF DEEP LEARNING
1) Automatic Colorization of Black and White Images
Image colourisation is the problem of adding colour to black and white photographs. DL can be use the objects and their context within the photograph to colour the image, much like a human operator.

2. Automatically Adding Sounds To Silent Movies
In this task the system must synthesize sounds to match a silent video. A deep learning model associates the video frames with a database of recorded sounds in order to select a sound to play that best matches the scene.

Deep Learning has a plethora of applications, and is gearing up to be a driving force of technology in the years to come. When it comes to future prospects in this field, the sky is the limit, and we can expect to see meaningful research done on deep learning in the near future.

ASHWINI SWAIN
TE IT

Back in 2000, gaming was pretty simple. You just had to turn on your Nintendo Gameboy or NES system, insert the game cartridge and help a highly pixelated Mario jump over obstacles and save princess peach.

In the last 17 years, however, gaming consoles have come a long way. From two button games to virtual reality, it has been an exciting journey. Now gaming consoles have successfully blurred the line separating the real world, from the virtual.

What is virtual reality?

To put it in a nutshell, virtual reality is technology which recreates virtual sound and images in a real environment. You could be shooting terrorists with a rifle in your living room, catching pokemon on the sidewalk, or watch a movie with theatre like experience in the train.

The concept might seem pretty new, but it has been around for quite some time. A thing called a ViewMaster, launched back in the 1940s, was a VR device in which you had to insert circular 'reels' containing seven small photos, which were magnified and could be viewed when held close to the eye.

After the ViewMaster, there were several attempts to create a VR device which could have a digital input. However, they were all very bulky and had requirements which could be only be met by supercomputers of that era.

Now, technology has finally caught up with the concept. Laptops and consoles have sufficiently large memories and fast processors, to manage the requirements of VR devices. For example, the Oculus Rift requires a minimum of 8 GB RAM, fifth gen intel i5 processor and a high end graphics card. Most of the gaming laptops in the market have specifications much higher than that.

So how exactly does it work?

Modern VR devices work in a way quite similar to the ViewMaster. They usually contain a 100 · 110 degree wide screen (or your smartphone screen in case of Samsung Gear), and a lens which reshapes the image so that both the eyes get a stereoscopic 3D image. The focal length of the lens can be adjusted if required. The video input is via a HDMI cable, which is connected to a PC or gaming console. Some of the VR devices in the market also contain head tracking - they sense the movement of your head and change the image accordingly, resulting in a truly immersive experience. The time differ-

accordingly, resulting in a truly immersive experience. The time difference between the head movement and video movement is typically quite less (50 ms or lower).

Most VR gaming consoles have two parts – the basic VR headset and a controller, which may be touch enabled or have buttons. Some consoles like the PlayStation VR contain a camera as well, for headtracking . They might look bulky, but they are well balanced and fit quite nicely on your head. I wear glasses but still find them comfortable. Some people think that having a screen so close to your eyes would inevitably ruin them, but relax. The video should have a frame rate of more than 60 frames per second to be comfortable for viewing, and most of the new VR devices have a frame rate much higher than that – Oculus Rift has a frame of rate of 90 fps while the PlayStation VR has 120 – which means your eyes are pretty much safe (unless you end up playing the whole day – no guarantees then!).

VR devices are changing the way we play

VR devices are the biggest things in the gaming world since the invention of the LCD screen. They give us a 360 degree view, unlike the framed images associated with a computer or TV screen. And they are available on all platforms – VR devices like the Oculus Rift can be connected to a PC while the PlayStation VR can be connected to....well, a PlayStation 4.

Earlier many companies like Nintendo and Microsoft were skeptical of this VR revolution; they chose to stick to the traditional flat screen. However, even these companies are readying their VR consoles for the next year. With most new games being VR compatible, the sales of gaming laptops and consoles are seeing a huge rise. Many people are buying these consoles just out of curiosity, and my they are not disappointed.

And it's not just console and PC gaming that has been revolutionized by VR.With the launch of Samsung Gear, mobile gaming too has been taken to the next level. It resolves the basic issue of mobile gaming – the small screen. Since most mobile phone screens have a resolution of 1080p or more, the graphics of mobile VR games are good enough to give many computer /console games a run for their money.

So, what's next?

Now that VR gaming has captured people's imagination, companies are working hard to make the experience even better. HTC is all set to launch the next generation Vive in early 2017. Oculus is still planning on its next console, while the PlayStation VR is still quite new for an upgrade.

The major puzzle which VR console developers are trying to solve is eye tracking. Just like headtracking is used to change the image depending on the position of the head, eye tracking will make the experience even more immersive (the whole idea behind VR), by making adjustments depending on the position of the eye. This will help reducing motion sickness which happens at times (your brain gets confused when the images don't move with eye movement) while playing games.

Lately, backpack VR consoles have been hitting the news. It does away with the need for separate consoles/gaming laptops, you can simply wear the gear on your back – just like a college bag. The headpiece is attached to it, as shown in the image below.

This console is quite powerful, but at the same time rather portable.

Another thing that developers are trying to do is combining virtual reality with augmented reality (augmented reality is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view). When that happens, game developers can recreate Star Wars style air holograms!

However, as of now, the upgrades to the existing consoles won't be drastic. They would just have improved graphics and better ergonomics. But as more and more companies launch their devices, the competition is going to get exciting. People are looking forward to playing their favourite titles, in a completely new way.

ANSHUL VORA
SE EXTC

WEB 3.0

Web 3.0 is the new paradigm in Web interaction and will mark a fundamental change in how developers create websites, but more importantly how people interact with those websites. It is a unification of the currently existing internet technologies and the semantic web technology with applications that run beyond horizons.

Semantic Web Technology is an extension of the currently existing web technology through the standards pertaining to a common framework allowing data from various sources and in various formats to be accessed, shared and reused across applications.

The Semantic Web Technology is regarded as an intermediary across different content, information, applications and systems.

With the advent of Semantic web technologies, we will surely witness a massive growth in open source technologies. Everything ranging from APIs, protocols and software platforms will be uniform and available for all.

Web 3.0 is a simple term with a complex explanation. A simple definition of web 3.0 is a combination of artificial intelligence and semantic web technologies, where data in a common framework is available for machine learning.

For example, say you typed in a query on Google, the current web 2.0 browsers will retrieve results of all websites with even the slightest relation to your query, but with web 3.0, the browser will return just one, well compiled webpage containing all the relevant information collected from multiple links depending on applicability. And that's not all; this search result can be modified according to your preferences and your search history, making the result relevant for you. If you ask your web 3.0 browser, "Where should I go for dinner?", your browser would consult its records. Records like the restaurant reviews you gave, or maybe you posted a dislike for Mexican food on social media, or maybe some allergies that you have added to a health tracking app or your current location are cross-checked, before suggesting a list of restaurants.

Experts see web 3.0 as a framework that accesses a giant database with a superlatively complex query that results in a combination of results that may differ depending on its user, which is unique for every user.

Thus, web 3.0 is a more connected, open and intelligent web. Some experts believe,

web 3.0 will be like having a personal assistant who knows everything about you and can access every bit of information and present it exactly the way you would want it to be.

User centric internet might just be one side of the coin. The other side is security. What happens if someone performs an internet search on you? Since the web 3.0 browsers retrieves information based on your likes and dislikes, could people learn the things about you that you would rather keep private? Will your online activities become public knowledge? The answer is both, yes and no. Web 3.0 comes with an extremely intense security module, where the user decides what data the application can access. The more data access permitted the more personalised the results. For example, you may be looking for a restaurant, you allow the browser to access your preferences but not your location and then the browser will retrieve a list of restaurants with matching preferences for a much wider radius, regardless of however far they may be from your current location. Web 3.0 puts the baton of privacy in the hands of the user. You are responsible for your own security. The consequences for users with very little knowledge of how to work the internet could be catastrophic.

Web 3.0 does not seem such a far off dream. In fact, signs of web 3.0 have been observed as early as 2012, in the form of Siri. Many such voice commanded assistants have been coming around since then, the most significant ones being Cortana by Windows and Google Assistant by Google.

Artificially Intelligent web 3.0 is also a common speculation. Today, we are getting websites that have maximum user hits, so there is a better chance of hitting a good website. But as long as there is a human element, results can be manipulated. A website made for immoral purposes can be made popular by a group of users. So, if AI can learn to distinguish the good from the bad, it could produce results eliminating the bad elements.

Predicting the web 3.0 future is risky. Not long ago, concepts such as optical computing and virtual reality seemed so far off. With the ever evolving world, inventions have exceed expectations.

We could safely say that web 3.0 will bring about a change in how we use the internet and how the internet will evolve in the future with an enormous breakthrough, in not only web technology, but technology in general.

SNEH GAJIWALA
SE IT

GREEN COMPUTING

On 8th December 2016, innumerable readers of The Times of India came across an article with the following headlines "Google to switch to green energy entirely in 2017". Reading through the article one wonders whether green computing and energy efficiency are worthy front page news afterall. How much harm can a laptop or computer actually do? Aren't there more important issues to deal with? Why is green computing this important? How can one implement it on a personal level? It's time we put all these questions to rest.
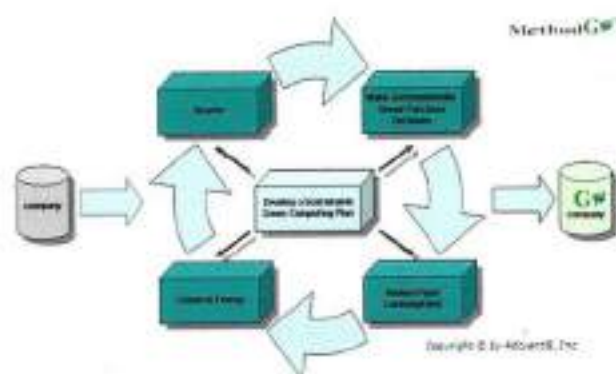
What is green computing?

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 or engineering, using and disposing of computing devices in a way that reduces their environmental impact. In 2014-2015 the University of Cambridge spent over $16 million on energy. This means spending $31 on energy every minute! This is just a small example of how energy is extensively used and wasted every year all round the world.

Energy efficiency is now the primary concern for most of the countries in the world. However green computing is not a new concept. The term "green computing" was first coined almost 25 years ago. Yet it took very long for companies to adopt green computing. In recent years, companies in the computer industry have come to realize that going green is in their best interest, both in terms of public relations and reduced costs. In order to implement this technology efficiently, we need to create fully recyclable products, reduce pollution, propose alternative technologies in various fields, and create a center of economic activity around technologies that benefit the environment. This includes a lot of research as well as finance. This is the main reason why green computing is still being implemented in different parts of the world.

Impact of Green computing:

But are the various techno-giant companies really developing better, greener technologies? The answer is undoubtedly positive. In 2016, Google consumed as much energy as the city of San Francisco. However the online giant said that all of its data centers around the world will be entirely powered with renewable energy sources sometime next year. Over the last decade, Google has made deals with renewable producers, guaranteeing to buy the energy they produce with their wind turbines and solar plants. With those

guarantees, companies can obtain bank financing to build more turbines. Today, Google is the largest corporate purchaser of renewable resource. Another good example of a company with a good green image is Dell. It is known for its free worldwide product-recycling program. Dell's Plant a Tree for Me project allows customers to offset their carbon emissions by paying an extra $2 to $4, depending on the product purchased. Another advantage about green technology is that unlike its carbon counterparts, their prices do not fluctuate. The more renewable resources are bought, the cheaper the sources get. Hence, this will encourage other companies to switch to green IT.

Like any other technology, green computing has its own set of problems. An IT manager's job, first and foremost, is to keep computer networks up and running. Security threats, viruses, malware, hardware failures and software upgrades ensure that this job remains deeply challenging, and that all other initiatives take a distant back seat. Energy efficiency is almost never a part of an IT professional's training. The time it takes to research energy-saving strategies, tools and techniques is often significant enough to serve as a barrier to action. Hence the problem with green IT is that the people we most need to act have the least to gain from doing so.
However, each one of us has to take some steps and measures towards a greener steps and measures towards a greener world. Are these steps difficult to take? No. Will they make a difference? Absolutely. If each one of us decides to work towards this initiative, Earth will be a greener, pollution-free planet very soon. We owe this to ourselves as well as to the future generations to come. There are many ways by which we could help. Average computer users can employ the following general tactics to make their computing usage greener:

So far, the IT industry has been focusing on IT equipment processing power and associated equipment spending. It's not been concerned with other requirements such as power, cooling, and data center space. However, going forward, the IT industry will need to deal with all of the infrastructure requirements and the environmental impact of IT and its use. The challenges of green IT are immense; however, recent developments indicate that the IT industry has the will and conviction to tackle our environmental issues head-on. The IT sector and users must develop a positive attitude toward addressing environmental concerns and adopt forward-looking, green-friendly policies and practices.

KRISHA MEHTA
SE COMPUTERS

INTERVIEW

Full time IT professional, part time musician – some people have it all. **Nevil Mehta**, an alumnus of our college, is one such person. After getting his bachelor's degree in IT, he worked with Tata Consultancy Services for a couple of years, before going to the University of Southern California for MS in Data Informatics. He presently works as a solutions consultant at PricewaterhouseCoopers, a multinational professional services network. A quick learner and a six sigma green belt, he is a great team player.

Currently based in Los Angeles, he made an intelligent software for Metrolink (LA's equivalent of local trains) to calculate the shortest distance between two stations. This was possible due to his knowledge of several languages/software like SQL, Oracle, ETL, etc.

Apart from this, he is a great singer and keyboardist as well. He has his own band – natural volume, which participated in several competitions across India. Here's his interview:

How was your experience as a student in DJ Sanghvi?

It was a pleasant experience to be precise! I entered in from a Diploma college and had a good time by meeting new people and taking part in cultural activities. I liked studying under all my professors as they were always nice and helpful to me.

What experiences of college life influence you till date?

One of the things I still use from my college life is the theory aspect of our studies. We all take it for granted and don't care much for theory as we see it as unimportant. I have been able to benefit from that when it came to discussing solutions for some task or client or even when it came to coding something.

Are grades the only thing which companies look for? If not, which other skills matter?

Grades are the one thing that in my experience has never been the factor for me getting a job. It might make a difference for students to qualify for an interview but moving from there, it is not very vital. It is the knowledge and skill set that will set someone apart. We all know about the best examples i.e. in Microsoft and Facebook how the CEOs have been college dropouts. It's the intent, skill set, selling skills and relations that matter a lot too.

Would you like to break a few fads of the industry?

I like to do things my way. One of the things I'd like to break is the social aspect of the industry. It is a great world out there and most people hesitate from making conversation and relations with their

colleagues or clients. I have learnt that over time and cannot be more happy, being socially active.

How would you inspire students to take up coding?

There is immense innovation in the world that helps different sectors to not only solve enterprise problems, but also uphold governments, institutions, companies, start-ups. With the right skill set and opportunities it is important that one chooses the right path for themselves be it coding or functional jobs. One thing that coders need not worry about is the chosen technology. If you know how to write pseudo code, you can write that code in any language. It is totally cool to look up syntax online all the time unlike in colleges at times!

What kind of project did you do in your final year?

My team and I thought of going a different route than the standard norm of making software suited for enterprises or small companies. I had a thought while watching the Big Bang Theory where in an episode they played 'Rock-Paper-Scissor-Lizard-Spock'. This drove the idea of putting the game of 'Rock-Paper-Scissor-Lizard- Spock' on a Chessboard. So we made a standalone, 2 player game titled Big Bang Chess where the characters and teams were different. It ran on .NET and implemented the rules that rock paper scissor would follow. It was super fun!

How do you prepare for interviews?

I believe in knowing my interviewer. Through research about the company, one is trying to apply to is of utmost importance. Making intellectual conversations with the interviewer makes them realize about your intent to join their firm. I read about the firm, the interviewer, the position and prepared for possible technical and functional questions.

ANSHUL VORA
SE EXTC

BLUE EYES, BLUE BRAIN

All human beings have some perceptual capabilities, the ability to understand each other's emotional level or feelings from their facial expressions. Blue eyes technology aims at creating a computer that has the abilities to understand the perceptual powers of human beings by recognizing their facial expressions and react accordingly to them. Imagine, a beautiful world, where humans collaborate with computers! The computer can talk, listen or screech aloud! With the help of speech recognition and facial recognition systems, computers gather information from the users and start interacting with them according to their mood variations. The machine feels your presence; verifies your identity, starts interacting with you and it will even dial and call your home in case of an emergency.

Today with the rapid advancements in the medical sector, we are able to manufacture virtual brains. Such a virtual brain is called as Blue Brain. Today, scientists are in research to create an artificial brain that can think, respond, take decisions and keep anything in memory.

The Blue Eyes technology system is a combination of a set of hardware and software systems. Blue eyes technology consists of:

1. Mobile measuring device or Data Acquisition Unit(DAU) of Blue Eyes technology
The DAU used in the Blue Eyes technology is

The 'voice' information from the user is transferred with the help of a headset, which is interfaced with the Data Acquisition Unit using a mini jack plug.

2. Central system Unit (CSU) of Blue Eyes technology
The CSU mainly contains codec and a wireless bluetooth module. This CSU section is integrated to a personal computer using USB, parallel and serial cable.

3. The Software used in Blue Eyes Technology
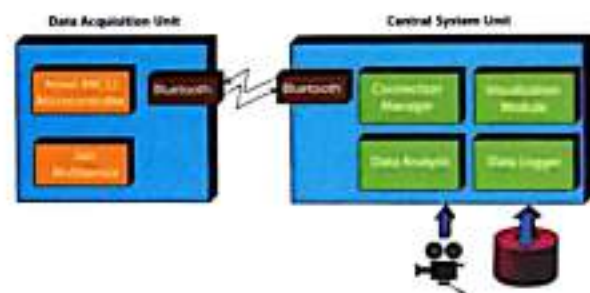
This software helps to transfer the data or information from managers to the data analyzers. Then it transfers the processed information from these data analyzers to the GUI controls. At last, the data visualization module supports a user supervisor interface section. The visualization module is in the off-line mode and it will continuously fetch the information from database and also record the video, audio and physiological parameters.

The process of making a computer having sensing and emotional capabilities is known

as "Affective Computing". The steps involved for designing such type of computers are given below:

Process of giving sensing capacity:

Blue Eyes uses voice recognition software, cameras and biometric sensors to understand and respond to the emotional levels of humans. The voice recognition software can perceive not only what is being spoken but also the tone of how it is said. High resolution cameras are used for tracking the minute facial expressions, hand gestures and eye movements. Biometric sensors are used for measuring and analyzing the muscle tension, body temperature, blood pressure,etc.

Detecting human emotions :

The Blue Eyes enables the machine to identify even minor emotional variations of human beings by a single touch on the mouse or keyboard and the machine starts to react with the user according to these emotional levels. This is done with the guidance of intelligent devices like "Emotion Mouse". The Emotion Mouse is designed to evaluate and identify the user's emotions such as fear, surprise, anger, sadness, happiness, disgust etc. when he/she is interacting with the computer. In Artificial Intelligent Speech Recognition system, an automatic call handling method is implemented without any telephone operator.

MAGIC Pointing:

In this approach termed as MAGIC - Manual and Gaze Input Cascaded, eye gaze pointing appears to the user as a manual job, utilized for fine selection and manipulation processes. Even so, a large amount of the cursor movement is removed by bending the cursor to the eye gaze portion, which surrounds the target.
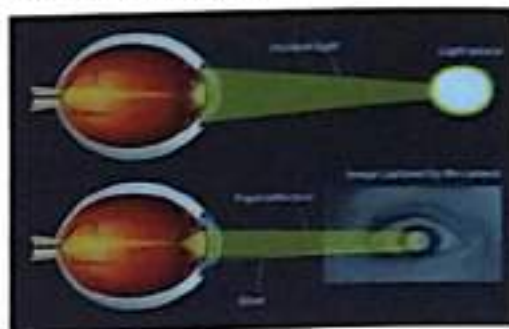
Working of the Blue brain:

Blue Brain is a futuristic technology. For doing it we will first have to upload the human brain to the targeted supercomputer. The uploading is possible by the use of small robots known as the Nanobots. These robots are small enough to travel through our circulatory system. Travelling through the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They can provide an interface with the computer that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connections. Thus the data stored in the entire brain will be uploaded into the computer. The day is not far away when this Blue Eyes technology will advance its way towards your devices. In future, this could even become a technology in your hand-held mobile device.

TANVI RUPAREL
SE IT

MACHINE LEARNING

Machine learning is the ceaseless evolution of computers as they stride to become more human-like.

"A breakthrough in machine learning would be worth ten Microsofts" -Bill Gates.

Machine Learning is the backbone of future computation. It has become so pervasive in our lives that we no longer notice it. The autocorrect on your phone to Snapchat's filters are all fuelled by machine learning algorithms which keep getting better at their job every time they are used.

What powers Machine Learning?

Machine learning can be understood as a vast neural network, just like our neurological system. These 'artificial neurons' work together to figure out the data that is supplied to them. So, for example, when this network processes the picture, it detects every pixel and its surroundings and based on a number of parameters like gradient and jaw cut it determines whether it has a person's face. To make this decision, it requires prior processing of millions of faces. It works on large sets of data to perform tasks with increasing accuracy. The network basically understands the connection between multiple parameters and provides an answer with astonishing accuracy. These days ML is being integrated with other services such as Cloud computing which allows small start-ups to use ML for innovative purposes. ML is no longer limited to massive corporations. In fact, most are open sourcing their developments on ML and only charging for their Cloud Suites. This allows ML to keep improving as millions around the world can contribute to it.
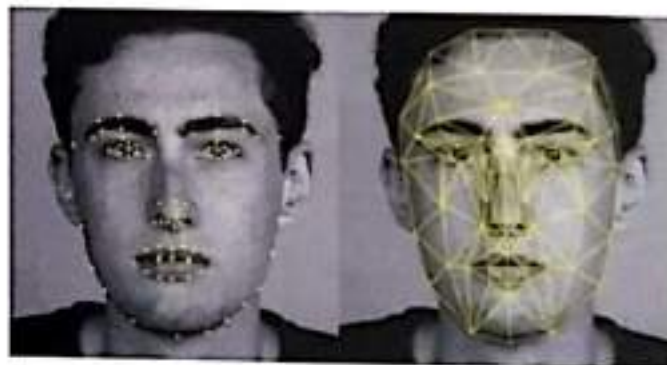
Machine learning powers everything

Silicon valley companies like Google are betting big on Cloud, AI and ML. It is this compendium that can be clearly seen in Google Photos. It's an amazing service which backs up all of your photos and videos for free and then using ML manages to detect every single detail in them. It automatically categorizes photos into a variety of parameters like people, animals, places etc. In return they get to work on an

even larger amount of data to improve their service. Then there is the ever popular "Ok Google" command, which allows you to activate and search without even clicking a button. This voice recognition system relies heavily on ML and is now able to understand queries in multiple languages. It can even accurately respond to them. Tensor Flow is Google's open sourced platform for ML and is currently the top GitHub project on ML. Tensor Flow has an open API that allows anyone to use it at any scale. It can work on powerful CPUs and GPUs or even a Raspberry Pi. Australian marine biologists are using high resolution images generated by Tensor Flow to observe the sea cow population which is under the threat of extinction. Radiologists have even adapted Tensor Flow to track Parkinson's disease. Google's current chief, Sundar Pichai firmly believes in ML and AI. He aims to incorporate these in as many Google products as possible in the future. In fact, they just released PhotoScan which uses ML to scan all of our album photos with as much efficiency and clarity as a high-end scanner to keep our old masterpieces safe in the cloud.

Snapchat uses ML in its famous filters. It uses a Ukrainian start-up's implementation to not only detect your face and mood but to also add real time filters which move as you move your face. Amazon, Microsoft and Google use it profitably in their cloud analytic services as ML makes processing massive amounts of cloud data cheaper and faster.

What's next for Machine Learning?
Machine learning will continue evolving as more data is fed into it. Right now it is difficult for machine learning to think fully like a human. In fact it is quite slower than a human when it comes to learning new things. Deep learning is the next major branch in ML. It involves representing data in more abstract ways using mathematical quantities like vectors, sets of edges and graphs. It will replace hand crafted features with algorithms. This in turn would lead to less need for supervision and make processing more efficient. Machine learning continues to make technological breakthroughs in medical science. It can detect tumours faster and even more accurately than expert radiologists. Machine Learning is only going to improve with time and continue making our lives a whole lot easier.
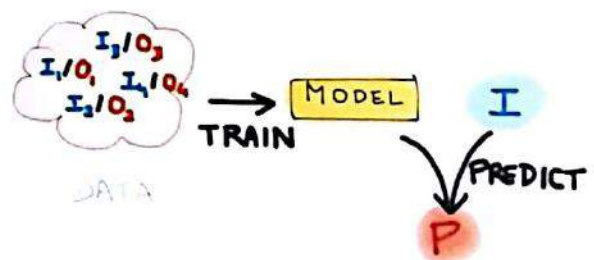
AKSHAY JAIN
SE COMPUTERS

THE EYE TRIBE

1997 was the year when mobile phones came to India. Mobile phones then looked much like the cordless landlines look now. Evolution has been huge in this zone. Right from features, to looks to controls, nothing is the same as it once was. Controlling a phone began with rubber buttons, went on to plastic buttons, to touch and now, to voice. But evolution, as we know it, never stops.

The Eye Tribe was a Danish start-up company that produced eye tracking technology. This was sold to software developers so that they could incorporate it into their applications and programs. The Eye Tribe's software allows a user to operate a smartphone, tablet, or computer with just the look of an eye.

In simpler words, Eye Tribe's software allows you to control any device with the movement of your eyes. For instance, we have all played, or at least heard of the game Fruit Ninja. The objective of the game is to slice as many fruits as you can without slicing a bomb. As of now, we swipe the screen along the position of the fruit to slice it. With Eye Tribe's technology, you could slice the fruit by simply moving your eyes. The possibilities of this technology are endless. One can type by simply moving one's eyes, scroll a webpage or even pause and rewind a YouTube video even though one's hands are preoccupied.

Another objective of eye tracking is security. Users can set a gaze-operated password, where they would have to look at certain parts of the screen in order to unlock the device.

The Eye Tribe has broken the record for smallest eye tracker device in the world, measuring about 20 × 1.9 × 1.9 cm. Also, the eye tracker does not require a separate power source, making it even more portable. The device uses a USB 3.0 connection, which allows it to run with most computers and tablets. The Eye Tribe is compatible with Microsoft Windows 7, OS X and newer operating systems but the company is in the process of working up support for other major platforms, such as Android. They are selling the device to developers with a simple software development kit using C++, C# and Java programming platforms.

The main components of the Eye Tribe tracker are a camera and a high-resolution infrared LED, which can easily be set up in a cell phone or mobile device. The Eye Tribe's device uses a camera to track the user's eye movement. The camera tracks even the

most minuscule of movements of the user's pupils. It then helps the software to determine where on the screen the user is looking.
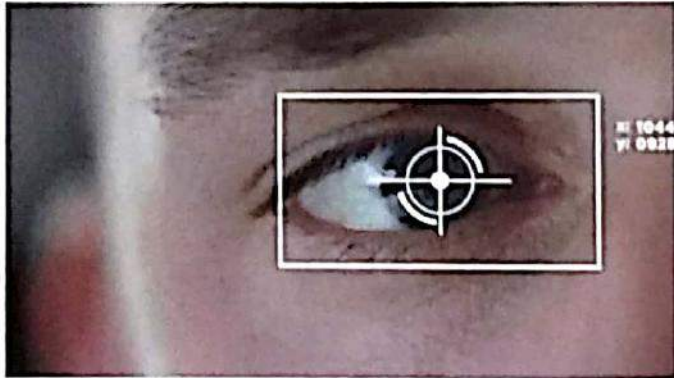
The Eye Tribe is a wonderful technology with endless opportunities. Combined with existing technologies of Virtual Reality and Augmented Reality, it just takes a massive leap into infinite possibilities. Oculus, the VR company acquired by Facebook in early 2014, probably thought the same when it acquired this 16 person eye tracking start up in December 2016.

It isn't difficult to speculate on how Oculus might use eye-tracking technology. Imagine navigating a virtual reality dashboard without the need to move your head.

Plus there are business benefits to this kind of technology. Facebook makes the vast majority of its revenue from advertising, and it's been assumed that ads will eventually make it into the virtual world as well. Tracking what users actually look at in VR could prove to be the key for delivering ads that are useful to the user.

Looking at their Twitter timeline, we can surely say that Eye Tribe will be a household technology in the near future. There have been updates of eye tracking technology used in making music and Eye Tribe has also been collaborating with Unity for gaming advancements. Moreover, they have also been posting updates about their latest SDK's and how they can be used by everyone.

Slice with your eyes

With such fantastic technology to look forward to, who knows what the future will be like? The Jetson's age doesn't seem so far-fetched after all.

SNEH GAJIWALA
SE IT

GOOGLE OPEN SOURCE

Open source refers to any program whose source code is made available for use or modification as users or other developers see fit. Open source software is usually developed as a public collaboration and made freely available. Open source software has various advantages. It's generally free — it has been estimated that open source software collectively saves businesses around $60 billion a year. These days for virtually every paid proprietary software system you will find an open source version. It's continually evolving in real time as developers add to it and modify it, which means it can be better quality and more secure and less prone to bugs than proprietary systems, because it has so many users poring over it and weeding out problems.

With open source projects gaining so much importance, tech-giant Google has its own open source projects as well. Google has released over 20 million lines of code and over 900 projects. Many engineers work on open source projects full time, and even more use their 20% time to create new projects or contribute to their favourite existing projects.

1. Android
Android is an open source software stack for a wide range of mobile devices and a corresponding open source project led by Google. Android OS is a Linux based platform for mobile phones. Android was released under the Apache v2 open source license. Android is developed by Google and the Open Handset Alliance (OHA), a coalition of hardware, software and telecommunication companies. Android is the world's most popular mobile operating system. Founded in 2003, today it has more than 1.6 billion users worldwide. It dominates the OS market with a 87.5% share. From all this data, it is clear that Android is undoubtedly one of the biggest open source projects to look out for.

android

2. Bazel
Bazel is Google's own build tool, now publicly available in Beta. Bazel is an open source tool that allows for the automation of building and testing of software. Google uses this tool to build majority of its software.

Bazel
(Fast, Correct) - Choose two

3.Go
The Go programming language is an open source project to make programmers more productive. Go is expressive, concise, clean, and efficient. It's fast, statically typed,

interpreted language. Google's Go was 2016's programming language of the year, according to TIOBE index , a highly-regarded resource for ranking the popularity of programming languages.

The TIOBE Index only catalogues the relative popularity of programming languages via search engines, not on the basis of how often they're actually used in real life. Still it's a handy tool for figuring out what skills to learn if you're chasing a career in technology.

Every year, this award goes to "the programming language that has gained the most popularity in a year." And "without hardly any competition Go has won the award for 2016", TIOBE writes. Since 2009, Google has been overseeing the community-led development of Go, a programming language aimed at helping web developers build apps at Google's scale and Google's speed, with a focus on rock-solid performance and ease of use, rather than chasing the latest fads in programming. Go has won its fair share of fans in programmer-land, because it provides a viable alternative to Oracle's Java, which has ruled the world of computer programming for the last two decades.

4.Omnitone

Virtual reality (VR) isn't nearly as immersive without spatial audio, and much of VR development is taking place on proprietary platforms. Omnitone is an open library built by members of the Chrome team that brings spatial audio to the browser. The software is available now on GitHub under an Apache license. To give people a sense of what's possible, Google has also posted two videos featuring spatial audio with Omnitone. The demos depict musicians performing at multiple angles. If your headphones are plugged in, you can rotate what you're seeing on screen and hear different parts of the audio more loudly or more softly, depending on your position relative to the source of the audio in the video. This approach depends on eight virtual speakers. Written entirely in JavaScript, Omnitone can decode audio for delivery on desktop, but it will also work with a mobile device or a virtual reality headset.

5. TensorFlow

TensorFlow is an open-source software library for Machine Intelligence. The open source software library was released in 2015 by Google to make it easier for developers to design, build, and train deep learning models. At a high level, TensorFlow is a Python library that allows users to express arbitrary computation as a graph of data flows. Nodes in this graph represent mathematical operations, whereas edges represent data that is communicated from one node to another.

KRISHA MEHTA
SE COMPUTERS

SPACEX

What is SpaceX?

In 2001, a Silicon Valley millionaire had a dream to conquer Mars. Now 16 years later his dream is realizing. Elon Musk found success with PayPal which was bought with a staggering US$1.5 billion in stock by eBay in 2002, of which Musk received US$165 million as part of his 11.7% share in PayPal. With US$100 million of his early fortune, he cofounded Space Exploration Technologies, now popularly known as SpaceX in May, 2002.

Elon Musk describes his life's mission to make humans a "multi planetary species". While there is at least a decade before humans reach Mars, the accomplishments of SpaceX in its 14 years of existence has been commendable. Arguably, they have only managed to bring something unique to Space technology in the last couple years. They became extremely popular when they announced plans to launch reusable rockets which could land instead of exploding into nothingness.

What's so special about this rocket producing company?

Firstly it's Elon Musk. There's always something special going on when he is around. Now, for the real stuff: They want to colonise Mars, reduce costs of their operations by commercialising their projects which means doing missions for Space Agencies like NASA and land rockets once they've completed their mission.

NASA actively supports SpaceX for its missions. The American agencies have maintained good relations since SpaceX inception as both have a common goal in mind: space exploration. However, SpaceX is a private company unlike NASA. It has his own set of investors, board of directors and employees like a regular private company with Elon Musk as the Commander in Chief. They have a constant concern to stay profitable to keep the investors happy, while keeping working towards their ultimate goal to reach Mars. In January of last year they managed to secure a billion dollar funding from Google and Fidelity which now co-own 10% of the company. SpaceX signed a contract to launch a communications satellite for HISPASAT and a Saudi Arabian ARABSAT 6A communications satellite using its Falcon rockets. Their private contracts are what help with the operating costs. They became the first privately owned space company to send a spacecraft (Dragon) to the International Space Station on 25th May 2012.

Reusable Rockets

This is probably their most unique and popular accomplishment. They went viral on the Internet when they managed to land a rocket back on land after deploying 11 satellites in the orbit on 22nd December 2015.

"I do think it's a revolutionary moment. No one has ever brought an orbital class booster back intact," SpaceX founder and CEO Elon Musk told reporters in a teleconference after the launch and landing success". We achieved recovery of the rocket in a mission that also deployed 11 satellites. This is a fundamental step change compared to any other rocket that's ever flown."

This was a major victory for them but it didn't come easy. Their previous two attempts at landing the rocket failed but as they say third time's the charm. After this they managed to land another rocket, this time in the middle of an ocean on 8th April 2016. In total there have been 3 unsuccessful landing which were major setbacks. Running space operations means that the stakes are always high.

Their Ultimate Goal

On 27th September 2016, Elon Musk unveiled SpaceX plan to start a 1 million person colony on Mars. He truly believes that colonising Mars is possible in the near future even though sceptics disagree. It seems like a bold claim but let's all board Elon's hype train for now.

"The plan he is proposing on the timescale he is proposing seem to me to on the edge of fantasy," space policy expert John Logsdon commented. He noted that Musk is known for setting ambitious goals on tight time lines, saying, "That's just Elon. That's his style."

The amount of funding required to make such a mission possible would be impossible for SpaceX to achieve alone. NASA, their all-time supporter, could be a major partner in such a mission. Technically SpaceX is ready for a manned Mars mission according to Logsdon. What holds them back is probably rocket science so I won't try explaining that in detail. One of the ideas Musk announced during his Mars announcement was using methane/oxygen propellent as rocket fuel which could be found on Mars.

As difficult as it may be to make humans 'multi planetary', if there's one person who can do this, it would be Elon Musk.

AKSHAY JAIN
SE COMPUTERS

OPTICAL COMPUTING

An optical computer is a device that uses the photons in visible light or infrared beams, rather than electric current, to perform digital computations. The photons are produced by lasers or diodes for computation. The goal is to create a computer that is more powerful and which has greater capabilities than regular electric computers. Most research projects focus on replacing current computer components with optical equivalents, resulting in an optical digital computer system, processing binary data.

Communicating with light is much easier than communicating with electricity. An electric current flows at only about 10 percent of the speed of light. This limits the rate at which data can be exchanged over long distances and thus is one of the reasons that led to the evolution of technologies ranging from signal fibres to fibre-optic networks. Visible-light and IR beams, unlike electric currents, pass through each other without interacting. They are confined essentially to two dimensions. Electric currents must be guided around each other and this makes three-dimensional wiring necessary. Thus, an optical computer, besides being much faster than an electronic one, might also be smaller.

Information gets sent in from keyboard, mouse or other external sources and goes to the processor. Processor then sends the information through logic gates and switches to be programmed. The information is then sent through different fibre optic cables depending on its final location. Some information will be sent to the holographic memory where it will then be saved. If the program would like to use the saved information it sends a command to the processor, which then sends a command for receiving the information. The program receives the information and sends a signal back to the processor to tell it that the task is complete.

This type of optical computer uses multiple frequencies to send the information through the computer as light waves. Unlike the Electro-Optical model, there is no use of electricity it strictly uses optics to transmit data.

Optical components could be integrated into traditional computers to produce an optical-electronic hybrid. Since optical computers use photons instead of electrons, light pulses send information instead of voltage packets. With the use of lasers, this information is changed from binary code to light pulses.

The fundamental building block of modern electronic computers is the transistor. To replace electronic components with optical ones, an equivalent optical transistor is required. The materials used to make this,

exhibit properties just like a bipolar transistor, where intensity of incoming light affects the intensity of the light transmitted through. Such an 'optical transistor' can be used to create optical logic gates like NOR, AND, OR, NAND etc.

These gates can be constructed from combinations of prisms, polarizing plates and quarter-wave plates. Optical logic gate performs elementary logic operation on light signals received along two optical fibres. Constructive interference in the transistor yields a high intensity i.e. 1 in binary. Destructive interference yields an intensity close to zero (a 0 in binary).
Lenslet's EnLight Optical Processor was the first programmable optical processor. EnLight targets computationally intense applications, such as video compression, video encoders, security (baggage scanning and multi-sensor threat analysis), defence and communication systems. Potential benefits of the optical processor include enhanced communications in noisy channels, multi-channel interference cancellation and replacement of existing multi-DSP boards.

A holographic memory can store data in the form of a hologram within a crystal. A laser is split into a reference beam and a signal beam. Signal beam goes through the logic gate and receives information. The two beams then meet up again and interference pattern creates a hologram in the crystal.

Due to its small size, increased speed, low heating, configurability, less power consumption and scalability it finds its applications in many fields like Artificial Intelligence.
A significant challenge to optical computing is that computation is a nonlinear process in which multiple signals must interact. Light, which is an electromagnetic wave, can only interact with another electromagnetic waves in the presence of electrons in a material and the strength of this interaction is much weaker for electromagnetic waves than for the electronic signals in a conventional computer. This may result in the processing elements for an optical computer requiring more power compared to a conventional electronic computer using transistors.

Today, optical technology is being promoted for its use in storage area networks (SANs), parallel processing, all-optical data networks, holographic storage devices and even biometric devices at airports to track potential terrorists.
"The optical technology that is emerging is starting to remind me of something that would be in the Tom Cruise Movie Minority Report" said Grant Evans, CEO of A4Vision, a maker of optical facial-recognition technology. "We're going to have computers, not too long from now, that don't have screens and where the information is presented as a hologram in the air above a keyboard" he told TechNewsWorld.

TANVI RUPAREL
SE IT

CSI Events

Codeshastra 3.0:

The third edition of DJ-CSI's flagship event, Codeshastra, was unlike its previous two editions. Being Mumbai's FIRST inter-college 24-hour overnight hackathon, Codeshastra 3.0 was divided into two rounds – Round 0 (intra-college) and the Main Round (inter-college). It was held in association with CSI Mumbai, and created waves enough to inspire other colleges to hold events along the same lines!

Round 0:

Round 0 of Codeshastra 3.0 took place on January 22, 2017 and served as an elimination round for the main event. 48 teams (consisting of a total of 197 students) from our college participated for this round and 12 teams qualified for the Main Round of Codeshastra 3.0.

Main Round:

Codeshastra 3.0 kicked off on January 28,2017 with the inauguration ceremony. Mr. Suresh Shan from Tech Mahindra was our Chief Guest for the event and represented CSI Mumbai.

41 teams from 17 colleges across the city and state participated in this event which began on January 28, 2017 at 4pm and went on till 4pm on January 29, 2017. There were 144 participants present who worked on problem statements based on the themes of Digitizing Farming, Aid the Disabled and Disaster management. Food, beverages, unrestricted Wi-Fi and sleeping bags were provided to the participants free of cost throughout the event.

The winners were adjudged as CCDev (DJSCE) followed by Teletubbies (DJSCE) as the first runners-up. Brawlers (RAIT) and Starlords (TCET) were tied at the third place. The winning teams were awarded prizes worth ₹75,000/- which were sponsored by L&T Infotech, Croma, Uber, Red Bull, Frapp and Brijeel amongst others. This event, which saw a massive participation of over 340 students, was truly a memorable one and will be etched in our minds for years to come.

CSI WEEK:

Commencing from 8th March, 2017 and ending on 14th March, 2017, DJ-CSI conducted a series of workshops that was collectively named "CSI WEEK".

The introductory workshop, "Databases using SQL", was taught by Zaid Merchant (Chairperson, DJ-CSI). A wide range of practical and theoretical knowledge about databases was provided to the students.

CSI week continued with the popular

"Photoshop" workshop which was taught by Dishith Poojary, the co-technical head (creative) of DJ-CSI. A wide variety of photo editing tips were shared with the participants. Third was the 2-day "Python" workshop which introduced the concept of data structures and Python amongst students. This workshop was taught by Siddhant Gada, the co-technical head (events) of DJ-CSI and Monik Pamecha, a fourth year student of our college belonging to the department of Computer Science Engineering.

Last was the "Web development using Bootstrap" workshop which was held by Akshen Kadakia, the vice-chairperson (technical) of DJ-CSI. He introduced the concepts of HTML, CSS and Bootstrap to the students and practically implemented codes along with them.

Android Foundation Workshop:

In association with Trinity 2017, the annual festival of our college, DJ-CSI conducted the "Android Foundation" workshop which was taught by Rushabh Dharia, the co-technical head (events) of DJ-CSI, on 23rd March, 2017.

DJ ASCII:

DJ-CSI co-hosted the 2nd edition of DJ ASCII - a state level project competition - along with DJ-ACM student chapter on 1st April, 2017. It saw massive participation of students from our college as well as outhouse colleges. Along with the project presentations, posters were displayed by the students of the final year from Computer Department and IT Department of the college.

TechnoScript:

"TechnoScript" was a technical article writing competition which was open to all the students in college. After sifting through many phenomenal articles, Ashwini Swain, who penned an article on Deep learning, was adjudged the winner of TechnoScript! Just flip through the pages to read his article!

DJ-CSI and DJ-NSS Collaboration:

DJ-CSI continued with its promise of giving and helping, and announced the launch of a brand-new website djnss.in for the NSS chapter of our college in November 2016. The website helped replace paperwork with online registrations, which was not only convenient for the applicants, but also provided the NSS with a complete database of its members. Moreover, changes could be made to the website as and when required without requiring assistance from DJ-CSI.
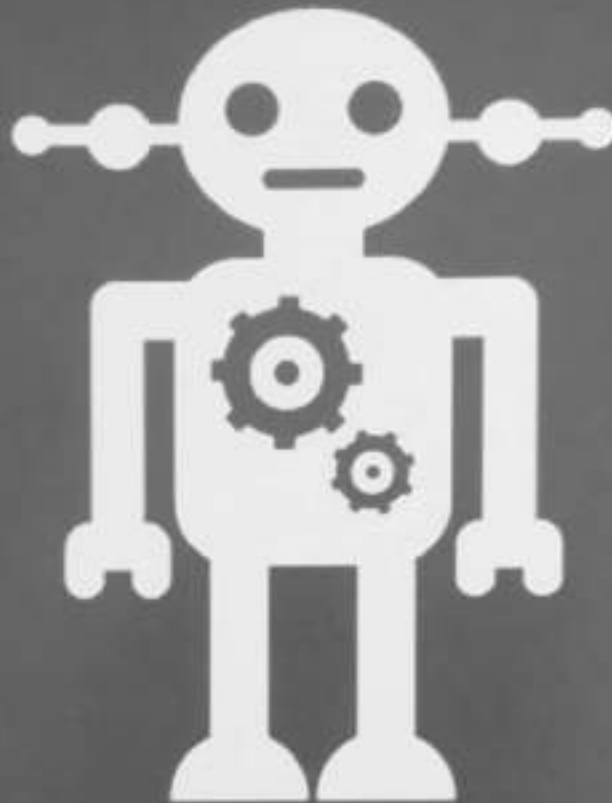
MAGAZINE COMMITTEE

EDITORS

Sagar Shringarpure
(TE COMPS)
Shweta Krishnan
(TE COMPS)
Prutha Dubhashi
(TE IT)

DESIGNERS

Dishith Poojary
(TE COMPS)
Raj Patel
(SE IT)
Vyom Unadkat
(SE IT)

WRITERS

Akshay Jain
(SE COMPS)
Anshul Vora
(SE EXTC)
Krisha Mehta
(SE COMPS)
Sneh Gajiwala
(SE IT)
Tanvi Ruparel
(SE IT)