CHRIST
(DEEMED TO BE UNIVERSITY)
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DEPARTMENT OF COMPUTER SCIENCE

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"Every once in a while, a new technology, an old problem, and a big idea turn into an innovation"

DEAN KAMEN

Message from
THE VICE CHANCELLOR

The word Technology has been derived from the Greek words *"techne"* and *"logos"* which is interpreted as the use of knowledge to create something that enhances life. Technology, with its ever-evolving nature, has since time immemorial played an integral part in the growth and development of mankind. The radical changes and advancements we encounter in the world around us are all courtesy of major technological breakthroughs that have paved the way for a better quality of life.

The advancements in this field have impacted the way humans think and work and it is needless to say that technology combined with human excellence has limitless possibilities for growth. The last decade has been a glorious time in the history of technological developments and the future seems even more promising with rapid developments in the field of Machine Learning and AI.

The 20th edition of InfoByte by the Department of Computer Science intends to capture the interaction between technology and humans. I congratulate the faculty and students of the department for continuing the legacy of InfoByte which has provided the platform to learn and record such reflections.

Dr Fr Abraham V M
VICE CHANCELLOR

Message from
THE HOD'S DESK

Excellence and Service have been the driving factors behind the sucess of every Christite. CHRIST (Deemed to be University) strives to inculcate these values deep in the foundation of every student. The department of Computer Science has always endeavoured towards tuning its students with the required technical and soft skills.

The 20th edition of InfoByte, the annual IT magazine curated by the Department of Computer Science intends to invoke curiosity about existing technologies and upcoming developments in the field of Computer Science through articles written by the students and faculty members of the department. InfoByte is not just a tech magazine; it is an encouraging platform for our tech aficionados to showcase their artistic talents and interests. This vibrant exhibit of their affinity for technology refines the magazine with each passing year.

We are thankful to the authors, photographers, artists and poets who have shown interest in submitting quality content for the magazine. We hope that this magazine provides the readers an opportunity to learn and develop a new and exciting technological advancement, through an immersive reading experience.

Prof Joy Paulose
Head Of Department

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IV

POEMS AND FRAGMENTS

V

DEPTH OF LEARNING

Bhavya Kukkar
1CMS
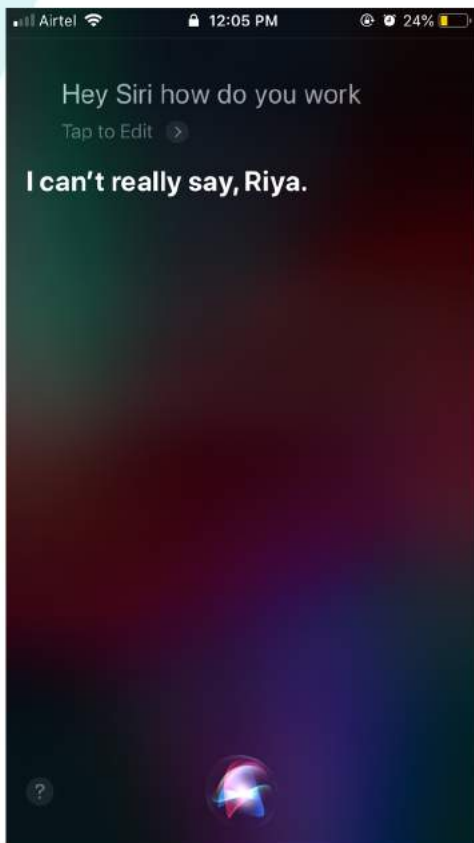
Siri-ously? Is that all you've got to say?

Have you ever wondered "who trains Siri?" or "how exactly Word Lens works?" (hint: it's all about learning).

Assistance bots like Siri and Alexa can be broadly termed as Artificial Intelligence (AI) that primarily work on Machine Learning (ML) and Deep Learning (like DNN). To understand 'Deep Learning', we must first understand what is ML, which is a more of a general topic; one may call ML a fragment of Artificial Intelligence.

Machine Learning is the concept by which a computer program can learn and adapt to new data, without any human assistance after a certain point of time. Since there has been a huge surge of data (big data) in this 'digital era' from various sources like social media, internet search queries, e-commerce platforms, and online cinemas. Analysts and data scientists all around the world are coming up with different ways to gather, process, communicate, and share useful data. The most effective of these ways happens to be through computers, or more specifically, AI. One of the most integral parts of AI is Machine Learning where instead of relying on explicit instructions from a user, the machines rely on algorithms and draws inferences.

Deep Learning is a branch of Machine Learning, that imitates the working of the human brain in processing data, creating patterns and understanding them for decision making. It has networks that are capable of learning from unlabelled data, without any (or least) supervision. Deep learning learns from vast amounts of unstructured data, that could normally take humans decades to understand and process. What makes Deep Learning a 'subset' of Machine Learning, is that it utilizes a hierarchical level of artificial neural networks to carry out the process of machine learning.

This means that the networks in Deep Learning are made with the aim to imitate the human brain, with neural nodes connected together like a web. While traditional programs build analysis with data in a linear way, the hierarchical function of deep learning systems enables machines to process data with a nonlinear approach. However, down the line where every technological development meets, they all serve the same purpose of transforming data into data for the good of society and humanity.

WALKING DOWN THE COMPUTATIONAL LANE

Gary Gabby Jose
5CMS

Perhaps you would have guessed my identity from the very way I have begun my tale. I am a computer. In other words, my job is to compute things. This job has tested me relentlessly for centuries and I have been badgered by the ever-changing expectations upheld by the "very humble and patient" human race.

In the beginning, I took the form of human fingers but later I was promoted from phalanges and meta phalanges to stones and other objects that even today remain in faithful communion with nature. Humankind then decided that these devices were too primitive and therefore converted me into a seemingly random combination of beads that they called an abacus. This form of mine existed for an unprecedentedly long time. Gradually I assumed different forms, each better than its predecessor. Coming to the 19th century, a mathematician named Charles Babbage revolutionized my status by inventing a difference engine and by introducing the model of an analytical engine, whose importance was realized many years after his death. This propelled me into the world of mechanics which further pushed me into electromechanics and more than half a century later, I snowballed into the world of electronics with ENIAC (Electronic Numerical Integrator and Computer), which was considered satisfactory by Alan Turing.

From that moment on, I became a buzzword and hopscotched from vacuum tubes to transistors to integrated circuits to microprocessors. Oh, do I seem too complex already? Just wait and watch. Towards the end of the 20th century, humans started to think of ways of allowing me to think for myself. They called it being artificially intelligent! This, along with other concepts like machine learning, and data sciences, to name a few, seemed to make a mountain out of a molehill. However, in reality, they introduced me to areas that made it possible for me to be present in almost every sphere of their lives and workplaces. I have become an indispensable part of the human race, making me man's best friend. This is not the end yet! I am being improved every minute in numerous parts of the world so that I can deliver on time, every time.

However, amidst all this success and euphoria, I am concerned about my users. I am being misused in many ways that I can only try to regulate but can not understand the motive behind their endeavors. Instead of doing something destructive, use me for constructive computing tzhat benefits all.

It is often argued that I am one of the major reasons for the unemployment crisis. This is completely unjustified which I have valid reasons against. Firstly, you created me. No matter how powerful I become, I will always remain subordinate to you. Secondly, I do not replace you at your jobs. I rather open new doors by providing you with more job prospects. This misleading notion has left me puzzled. Therefore, please be optimistic and look on the brighter side. Nonetheless, I had fun connecting with you and walking down the memory lane, or rather the computational lane. I have inferred during this retrospection that you are a very patient person to have reached the end of my story. Thank you for using your time constructively by listening to my tale.

TRENDING COMPUTER TECHNOLOGIES

John Paul B
3 CME

"SCIENCE IS A BEAUTIFUL GIFT TO HUMANITY"
- DR A. P. J. ABDUL KALAM

This article is a brief discussion about 5 of the most trending technological developments, in the field of Computer Science, of the 21st century.

1. ARTIFICIAL INTELLIGENCE AND ROBOTICS:

The global robotics industry is forecasted to be worth US$80 billion, which is largely dependent on the interest and investment in AI; one of the most controversial and fascinating areas of computer science research. The technology is still in its early stages, but tech giants like Facebook, Amazon, Google, and IBM are investing a huge amount of money and resources into AI research. There's certainly no shortage of opportunities to develop real-world applications of the technology, and there's gigantic scope for a breakthrough.

2. BIG DATA ANALYTICS:

Big data analytics is the often complex process of examining large and varied datasets or big data to uncover information including hidden patterns, unknown correlations, market trends and customer preferences that can help organizations make knowledgeable business decisions.

In 2012, the Harvard Business Review branded data science among the most 'desirable jobs' of the 21st century. There has been a massive growth in demand for experts in this field and doubled efforts on the part of brands and agencies to boost salaries and attract data science talents. From banking to healthcare, big data analytics is everywhere as companies increasingly attempt to make better use of the enormous datasets available to them to personalize and improve their services.

3. COMPUTER-ASSISTED EDUCATION:

Computer Assisted Learning also is known as Computer-Aided Learning is defined as learning through computers with subject wise learning packages/materials.
The use of computers and software to assist education and training, computer-assisted education, brings many benefits and has many uses. For instance, it can provide a personalized path which enables students to learn at their own pace. The field is still growing but promising, with many educators praising its ability to allow students to engage in effective, individualistic and play-based learning.

4. INTERNET OF THINGS (IOT):

In this period of the digital age, we have become comfortable with our refrigerators knowing more about us than we know about ourselves and our Apple watches transmitting every movement of ours.

These self-monitoring technologies have even slithered inside our bodies. Consumers are comfortable with self-tracking using external devices (such as fitness trackers and smart glasses) and playing games using augmented reality devices. Digital pills are entering mainstream medicine, and body-attached, implantable, and embedded IoT devices are also beginning to interact with sensors in the environment. These devices yield richer data that facilitate more interesting and useful applications, but also raise concerns about security, privacy, physical harm, and abuse.

5. CYBERSECURITY:

Cybersecurity or information technology security is the technique to protect computers, networks, programs and data from unauthorized access or attacks that may be used for exploitation. Network security includes activities to protect the usability, authenticity, uprightness, and protection of the network.

According to the US Bureau of Labor Statistics, cybersecurity jobs are predicted to grow by 28 percent between 2016 and 2026 – much faster than average for all occupations, raising concerns about the shortfall in qualified graduates. In February 2015, Barack Obama spoke of the need to "collaborate and explore partnerships that will help develop the best ways to bolster our cybersecurity." It is not hard to explain why he might think so. We live in a hyper-connected world, in which absolutely everything from dating to governmental infrastructure is done online.

In today's world, data protection is no longer an option, it has become a necessity to protect us from being exploited.

NET NEUTRALITY: THE FREEDOM OF INTERNET

Shaunak Sengupta
1BCA

Internet- the repository of all human knowledge and cute dogs has been trying to do somersaults. Pragmatically speaking, in today's world, we cannot imagine a day without the internet. As the internet grows older and popular by the hour, its influence and significance is rapidly increasing as well. The internet, that has become a vital part of our lives, is regulated by the government/ regime we are under. A few countries have laws and rules in place to monitor internet usage of its citizens. Now, questions arise regarding how 'free' and 'open' should the internet be?

The core principles of net neutrality gave incentive to the internet's popularity and widespread use. Net neutrality ensures that any Internet Service Provider enables access to all content and applications (regardless of the source) without favoring or blocking particular services or websites, i.e., it essentially means that any Internet Service Provider should not have any preference. A streaming movie from Netflix shares the same crowded fiber optic cable as the pictures from your parent's 25th wedding anniversary. The Internet has no favourites.

Net neutrality is the idea that the pipeline from which you consume data is not allowed to arbitrarily pick favorites in terms of the content you consume. For instance, if you like to use Google search and your roommate likes to use Bing search, your Internet Service Provider cannot say, "Well, Bing is paying us more so we're going to slow down Google and other search engines to make Bing load faster."
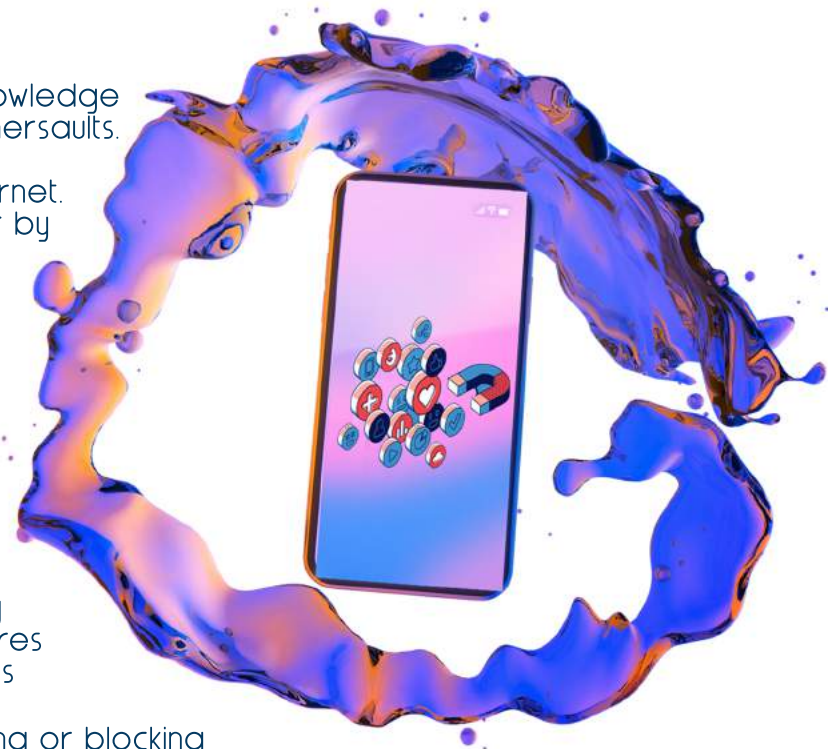
At its core, net neutrality is not just about speed, it is the sanctum sanctorum of the internet; a principle that denies the Internet Service Providers like Airtel, Hathway, Jio, Vodafone, etc., from shaping or limiting the choices we make online. It helps to ensure an equal field of opportunity for all companies on the internet so that the big companies cannot undermine small companies even before they take off. In India, back in 2015, there was a storm raging on the internet regarding this issue. There was a protest taken out between the telecom users and operators on the issue of net neutrality. The trigger was a 117-page paper published by the regulator, Telecom Regulatory Authority of India (TRAI), titled 'Consultation Paper on Regulatory Framework for Over-the-top (OTT) Services'. Over-the-top services include apps like Skype and WhatsApp that ride on top of telecom operators' networks, which basically gives these services more traffic on the internet.

An attempt by leading operator Airtel was made to charge extra for internet calls and other amenities after the 2015 protest. This led to a massive backlash from the users and even big companies like Flipkart pulled out its deals with Airtel to let its customers browse the site for free. Within a week or so, more than 800,000 Indians sent emails to TRAI, demanding free and fair internet.

Thankfully, now in 2019, things are better because of the country's endorsement of the November 2017 recommendations by the TRAI. The recommendations explicitly prohibits operators from throttling data speeds for any online service and mandates all content to be treated the same. "Any violation of the rules of net neutrality – which come into effect almost immediately– will be met with stiff penalties", said India's Telecom Secretary, Aruna Sundarajan, to the Press.

Internet is not a luxury, it's a necessity. Therefore, whenever faced with such adversaries which restrict and limit our free access to one of our most basic needs, all of us must come together and raise our voices; Gamers, Instagrammers, YouTubers, 9Gagers, Redditors, and all the other communities to demand for the internet to be free and open!

NEW DIRECTIONS FOR INFORMATION SECURITY USING DNA COMPUTING

Dr Sreeja C S
Assistant Professor

DNA Computing, also known as Molecular Computing, got relevant diligence in 1994 due to its computational properties, exploited by Dr. Leonard M. Adleman of the University of South California. Adleman's groundbreaking experiment solved the complex computational problem of Mathematics- The Hamiltonian Path problem- by manipulating DNA, redefined the word 'computation'. The feasibility of computation at molecular level marked the new era of Nano Computing. DNA computing is an exciting and fast-developing interdisciplinary area of research which includes theoretical approaches, experiments and applications .Figure 1 depicts the helical structure of DNA.
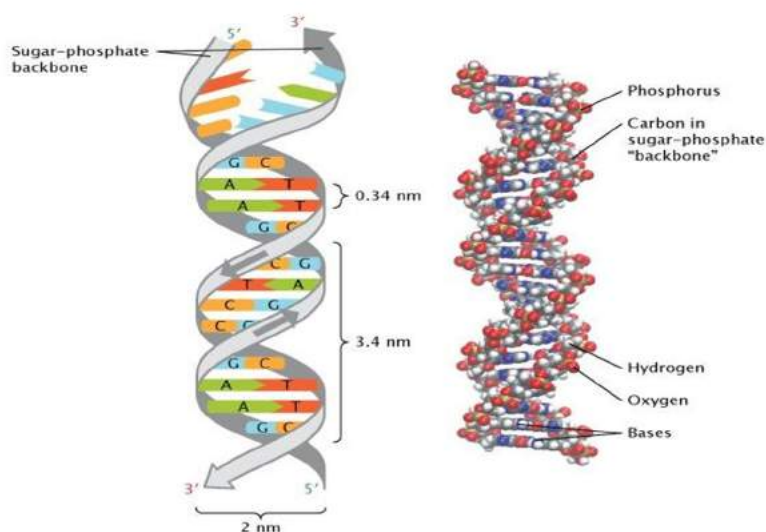

FIGURE 1

Genomic Steganography performed by Carter Bancroft et al. geared up DNA based encryption techniques which led to the growth of DNA Cryptography. DNA based encryption can be performed in two ways; using the wet lab and by simulating the biomolecular concepts. The major biomolecular concepts used for encryption techniques are Central Dogma of Molecular Biology (CDMB) and Polymerase Chain Reaction (PCR). The biomolecular concepts can be simulated using Digital DNA which is available in databases in millions as a part of the Human Genome Project (HGP). This led cryptographers to simulate the bio-computing concepts using DNA sequences. Cryptanalysis of DES using a molecular computer also extended the research area of DNA Computing.

DNA computing has relevance as it's considered as one of the nano computing technologies that can be applied to information security concepts. The triad of Information Security - Confidentiality, Integrity and Authentication can be achieved by using DNA Computing. DNA Computing allows to generate hybridized protocols in conjunction with conventional cryptographic techniques which enhances security by an additional layer of biocomplexity. DNA based cryptography can be broadly classified into Symmetric DNA Cryptography, Asymmetric DNA Cryptography, Pseudo DNA Cryptography and DNA Steganography [6]. Comparing the performance evaluation of DNA cryptography over conventional cryptography is another area of research, this also includes hybridizing the DNA cryptography with modern cryptography to yield better security and efficiency.

Authentication is a critical aspect and considering it is an entry point into the system, it needs special attention. DNA based encryption plays a vital role as it can be paired with password-based authentication, image-based authentication and two-factor authentication such as smart card. DNA computing has broad applications in authentication itself such as User authentication, Product authentication are a few to list. Data Integrity and Non-repudiation can be achieved using DNA encryption as the DNA has unique features which make it befitting to complete information security aspects. Many of the DNA encryption algorithms proposed so far concentrate on the confidentiality whereas authentication based on DNA needs more attention, especially in the health care and cloud computing where data security and privacy are major concerns, and many open challenges exist in these domains.

SMART IS OPEN, OPEN IS SMART

Prof Prabhu M
Assistant Professor

Computer Science students and professionals all over the world have been supporting open-source software and services. For students, forming open-source communities in colleges, organizing seminars, hosting hackathons, and training them early in their respective disciplines aids them in joining the industry as developers. These practices will also enable a sense of commitment towards open-source.

Open-source software (Free Libre, MySQL) are programs which give users the freedom to run the program for any purpose. It allows the user to study and modify the program and to redistribute copies of either the original or the modified program, without having to pay royalties to previous developers.

Hear about Linux? It is an open-source OS. The most obvious advantage of Linux over Microsoft Windows is that it is Linux is free. Windows OS incurs a licensing cost. The organization must not only pay for the OS license but also for other applications like Microsoft Office, Exchange, and SharePoint that run on Windows. Also, you cannot modify the OS as its source code is not openly accessible. It is the same case with proprietary applications running on it. However, in the case of Linux, OS can either be a desktop, server, or a distro which comes with no cost. A Linux distro (distribution) is an OS made from a software collection based on the Linux kernel. Although some Linux distros charge for support, they are inexpensive when compared to Windows. The related applications are completely free and open-source. Users can download the source code of a Linux OS, change it and use it without involving any cost.

Although Window's graphical user friendliness is exceptional, it has a relatively minimal learning curve. Linux distros like Ubuntu, Elementary OS, and Linux Mint are striving to improve the user experience that makes the transition from Windows to Linux for new users smooth and easy.

The Linux distros allow the user to choose from various available desktop environments. If a Windows user wants to migrate to Linux, WINE can be installed to have the feel of Windows on a Linux system. Windows will bore you with its default desktop theme whereas with Linux you can choose a Linux distro from an available list of many.

Linux is reliable compared to Windows. Linux rocks with its top-notch design, built-in security resulting in unparalleled up-time. Developers of Linux distros are much active and release major and minor updates from time to time. Traditionally, Unix-like systems are known for running for years without a single failure or having a situation which demands a restart. This is an important factor, especially when choosing a server system.

Linux systems are known for consuming fewer system resources (RAM and disk space) when compared to Windows. Hardware vendors realized the popularity of Linux and started making Linux compliant hardware/drivers. When running the OS on older hardware, Windows is slower.

There is no doubt that Windows has a large set of commercial software available. Linux, on the other hand, makes use of open-source software available for free. It is armed with easy to use package managers which aid in installing and uninstalling of desired software applications, and decent desktop themes certainly improves the speed of the system.
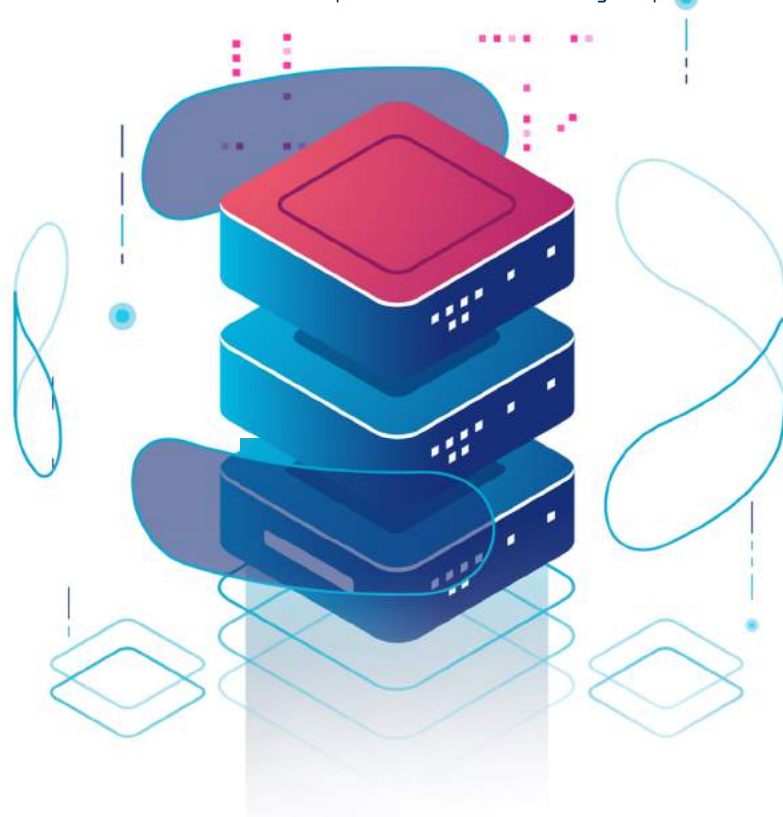
For developers, the Linux terminal offers a superior environment when compared to Windows. The exhaustive GNU compilers and utilities are useful for programming. Administrators can make use of package managers to manage software. Besides, it has an unbeatable CLI (Command Line Interface).

Windows is infamous for being vulnerable to malware, trojans, and viruses. Linux is almost non-vulnerable and more secure due to its inherent design. It does not require the use of commercial anti-virus/anti-malware packages. It respects privacy. Unlike Windows, it does not generate logs and upload data from your machine.
Linux allows the user to control every aspect of the operating system. It allows the user to install only the desired software and nothing else. It allows full freedom to install open-source applications from its vast repository.

The Bottom Line is this; there are more than 600 active different distros to choose from., each is different on its own and meant for a specific purpose. But Linux distros are highly customizable when compared to Windows. The above reasons mentioned are just the tip of an iceberg. There is so much more that you can do with Linux. One should always keep in mind that free is not the best, just like expensive is not the best. Linux will undoubtedly emerge as the winner, when all aspects are considered.

OMNIDIRECTIONAL TREADMILL

Dehar Nath Bhattacharya
ICMS
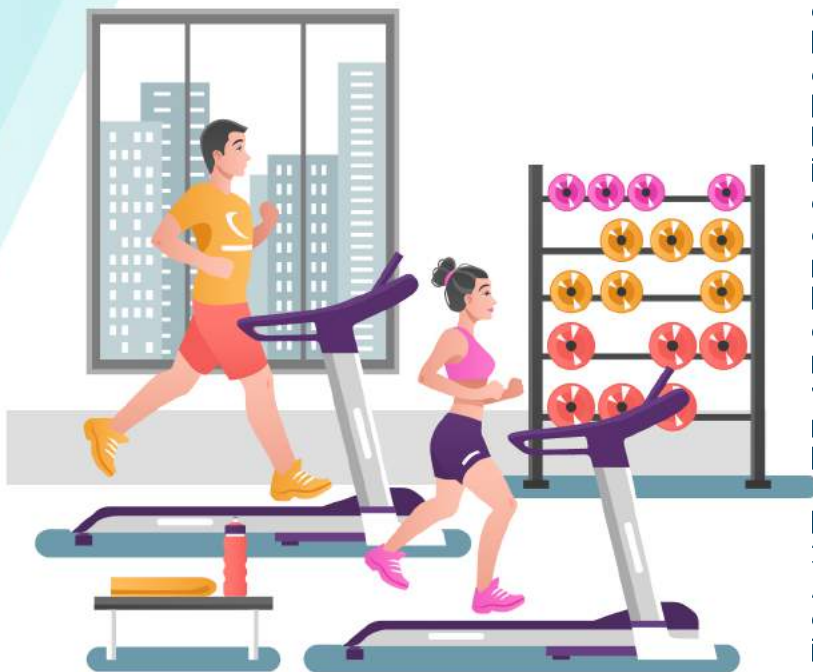
Treadmills are pretty simple devices, right? You set the speed you want to walk or jog on, you get on the machine, start moving, but you don't actually go anywhere. But all of the body movement you require your body to go through happens! This technology, people have recently realized, is perfect for VR because you can walk anywhere and use your body to go to a certain location in the virtual world, but never really leave the confines of your home. But the problem would be with the direction, as in, the user would want to go in more than one direction when he is in a virtual world; more than one axis for movement would be required.

Hence, the Omnidirectional Treadmill.

It is a treadmill which enhances movement in 360 degrees, or locomotion to be precise. A treadmill, made of treadmills. It's a combination of many treadmills. It basically is one big treadmill subdivided into many strip treadmills which move in a direction that is at a right angle with the direction of the bigger treadmill, thereby covering both the X and Y axes.

When a user walks on the treadmill, he has the provision of moving around 7-8 inches, actually, only to get back to the original position with the help of the smart treadmill. (Obviously, the retaining of the user's position, happens only in actuality, not in the virtual space he/she is in.) A circular ring structure guards the boundaries of the treadmill board in case the user needs support or in the case of any malfunction at all. The technology is to sense the centre of gravity of the user and to keep the centre of gravity vertically above the centre of the treadmill board. To be very specific, it is a semi-autonomous command position sensor which does most of the work. The gears required for such an experience include a VR-headset, a pair of foot trackers, and a pair of hand controllers. The objective of all of these gears is to track the user's movement. Basically, the body movement is tracked on 6 different points and that is enough to produce an artificial avatar for the user. There is a small device called the Virtual Reality Tracker which if screwed below any object whatsoever in the real world, the object gets inserted in the virtual world. Say you have a book which you want in the virtual world for some reason; all you need to do is screw a VR tracker below it and done!

The physics behind the working is also pretty simple. Whatever direction the user walks in, the deck moves in the opposite direction to keep the person in the centre with the exact same velocity and acceleration. Even when we use an ordinary treadmill, we know that we have to walk in the speed set in the machine and in the direction opposing to which the machine is moving; such that machine velocity + our velocity = 0, cancelling out each other. In the case of omnidirectional treadmills, things are naturally a little different because here there are two dimensions but the working, the logic, is moreover the same. Here, interestingly, nothing can be pre-decided unlike in the treadmill where we can set the speed and timings, according to our schedule. In here, the main thinking isn't something that the user does. The user just walks, randomly in accordance with his imaginations, to what he is doing in the virtual world. The treadmill here does all the reading and calculations to keep the user steady. The treadmill feels the user walking, in a certain direction, at a certain speed, and just undoes that with all the exact measurements. Basically, the treadmill does all the thinking here.

Another feature which comes into play here is the scale. Here, since we are basically projecting ourselves into the virtual realm by means of a set of tracking gears, we can choose what our virtual avatar looks like. And apart from colour, hair, and clothes, we can also set our height and width. We get this boon simply because we have our hands laid on the scale adjustment system. Similarly, we can also determine the distance we travel, virtually, via one step. We, basically, get to redesign ourselves the way we want!

However, in spite of all the advancements we have made all through these years in this field, there are a few setbacks still left to be covered. The feeling of acceleration, for instance, is technically negative. When we walk the treadmill, although we cannot actually see the board we are walking on (because we are in our own virtual world), we might feel that we are not moving at all because, subconsciously, we know that we are walking the same board. But when we stop, after walking, the inertia in the treadmill does move us a bit, actually, even though we have mentally and virtually stopped. Furthermore, we might get overshot and, hence, might need to be relocated. Basically, after getting carried away by inertia, we are not exactly in the centre of the treadmill board anymore. So, the board, soon enough, tries to set us back to the initial position ensuring zero displacements. These movements, that happen outside our zone of control, may cause us discomfort or distraction to our virtual activity or even worse, disbalance. These are hindrances to this technology but hopefully enough, they will be covered soon by our ever-expanding expertise in this field.

The problems we have are engineering problems. The machine lacks knowledge of intent. In our brain, we have the intention and, hence, we get to do the choosing; the deciding. But the machine faces a problem in here because it is pretty technical and, as mentioned earlier, without proper purpose, all it runs on is a bunch of algorithms and codes.
What we have in the industry right now is nothing but a prototype, which is working, now, after a lot of advancements in the field. Companies, like Infinadeck, are working on this very project. The issue with the lack of speed in this development is that this project demands a lot of input from the engineers, programmers, developers, etc. but, the number of people in the industry researching on this line is quite less. Engineers have a scale to measure the readiness of a product for the launch, where stage 9 states that the product is moreover ready. The omnidirectional treadmill has been rated around 6-7 stage in this scale by different engineers and professional reviewers. The prototype will be set for market manufacturing after correcting a few of the subsystems and making them fine for general use.

SITECORE

Dr Kirubanand V B
Associate Professor

Sitecore is a software used to create a seamless and personalized digital experience. It is an integrated platform powered by .NET CMS (Content Management System), commerce and digital marketing tools. It helps in creating, managing and optimizing websites, web pages and blog posts.

In Sitecore COVEO is used as Search Engine Optimization. COVEO's purpose is to filter the search and provide a result. Sitecore is a platform where we are able to personalize our website.

Sitecore is different from other CMS as it has several features. It is a licensed product along with support. It is used for multichannel automation and is used to analyze the error in the website when the site is down using Sitecore Log Analyzer.

Sitecore can be used for e-mail campaigning and can campaign via newsletter to acquire customers. Using Sitecore for A/B testing is another added advantage.

In Sitecore, MongoDB is used to collect data. It is used to store and manage Big Data. By using it, we can fetch user data with the aid survey using a campaigning method. In Sitecore, some content authors learn to create and manage content in the Sitecore Experience Platform.

New Relic is one such important platform. In New Relic, we can see several servers connected as well as the CPU utilization of each server, memory use of a server, graphical representation and much more. New Relic is most helpful for analyzing the errors when the site is down. It can obtain data of alerts received by a site via Application Monitoring Tools such as the Insights tool.

Finally, with the help of Sitecore, we can gain more insights of each customer and can improve their experience.

POETRY

LIFE ALONG WITH COMPUTER

Born at queen of hills Nilgiris
Nature is near, green tea gardens
Blue mountains hair-pin bends
Calculator Radio Television Tape recorder
Exclaimed experienced thrilled
DD days of Songs Regional movies
Ramayana Mahabharata the time
Dedicated Delighted
All were colorless Black and White
Life was colorful!
Studied at village school
Man – man interaction! Guru – Sisya!

The nineteen Eighties elder brother said
Computer was singing
Laughing initially later convinced
Thought like a tape recorder
The machine follows instruction Programming!
Man-machine interaction! Master-slave!

Internet-connected the two
Wow! Received mail from a friend
Great, it was Hotmail!
Learned simulated experienced
Multimedia NanoTechnology Robotics
RDBMS Supercomputer Cloud
Machine – machine interaction! Wi-fi!

Man plays with a man – sports
Man plays with machine – computer games
A machine plays with machine – a driverless car
Artificial intelligence expert system
Data weather stock prediction
The supervised or unsupervised result is ready
Machine learn by itself – machine learning! Recursion!

Dr Saravanakumar K
Associate Professor

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POETRY

The Journey

I look towards the horizon,
Through the dusk and wonder
Did I really made this count?
Amidst the endless number of pages
Of a millionth book
Lost amidst infinite light
Of a billion stars
Tasting my success
Hiding my scars
I look back at the beginning,
Recall my journey
Clustering my memories
That brought me this far

Beloved, to make existing things align

To the words that couldn't come out on time
To the moments that took away your shine
For I promise I won't do any wrong to you now
For I'll ensure there won't be ugly traces of mine
Because some distances have to be created
To make the existing things align

Set your soul free

To get your fruit of happiness
From the tall enchanted tree
Break the chain that holds you down
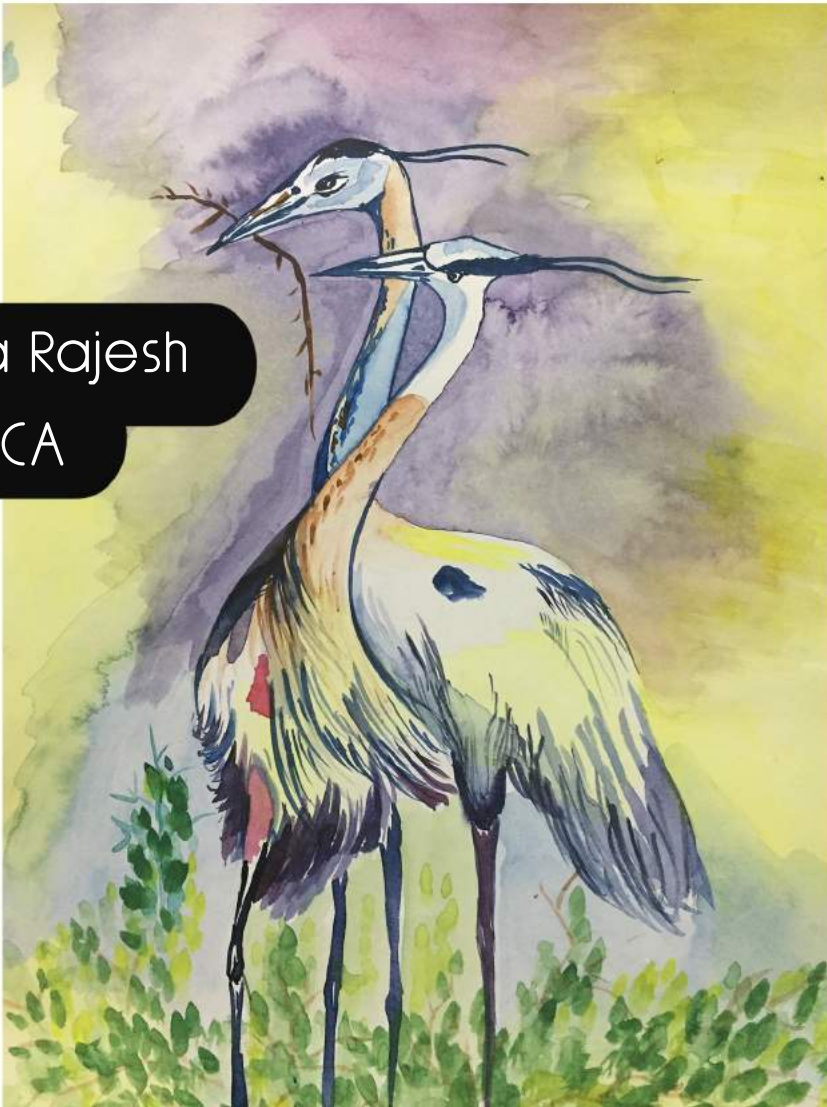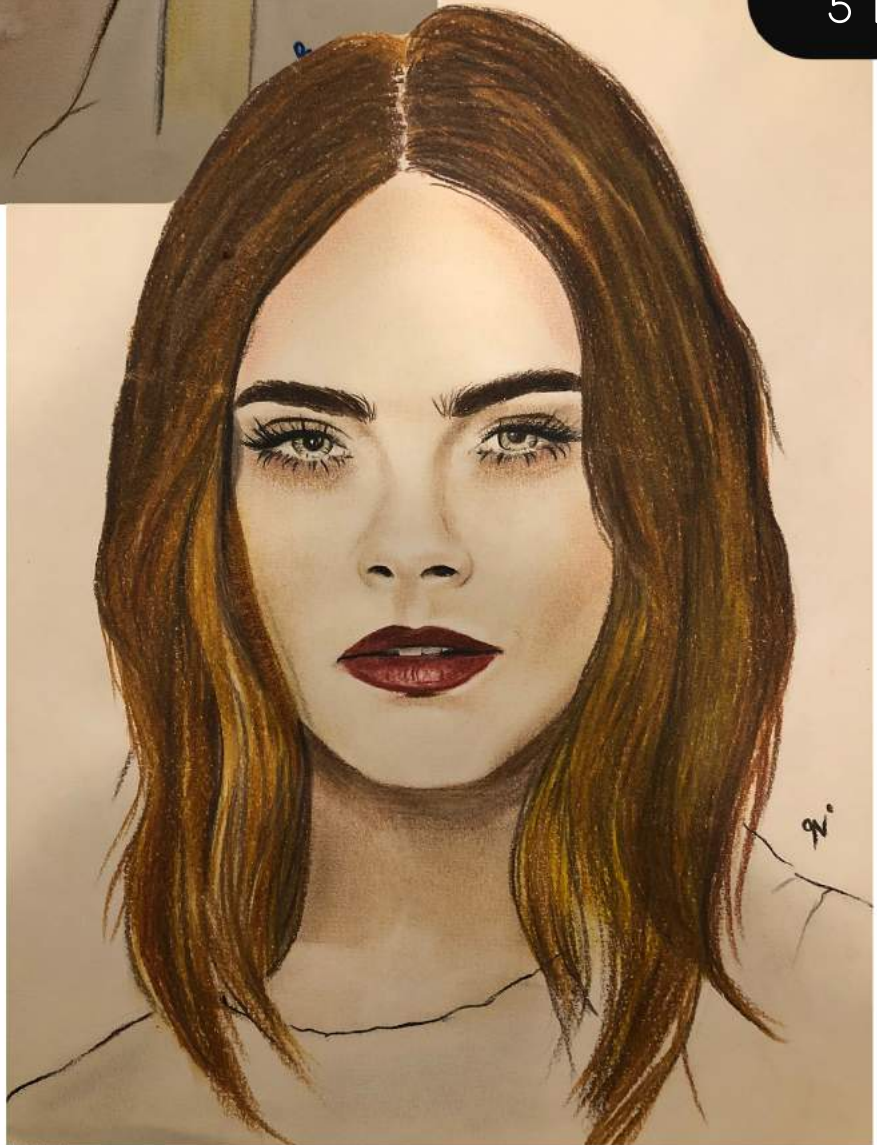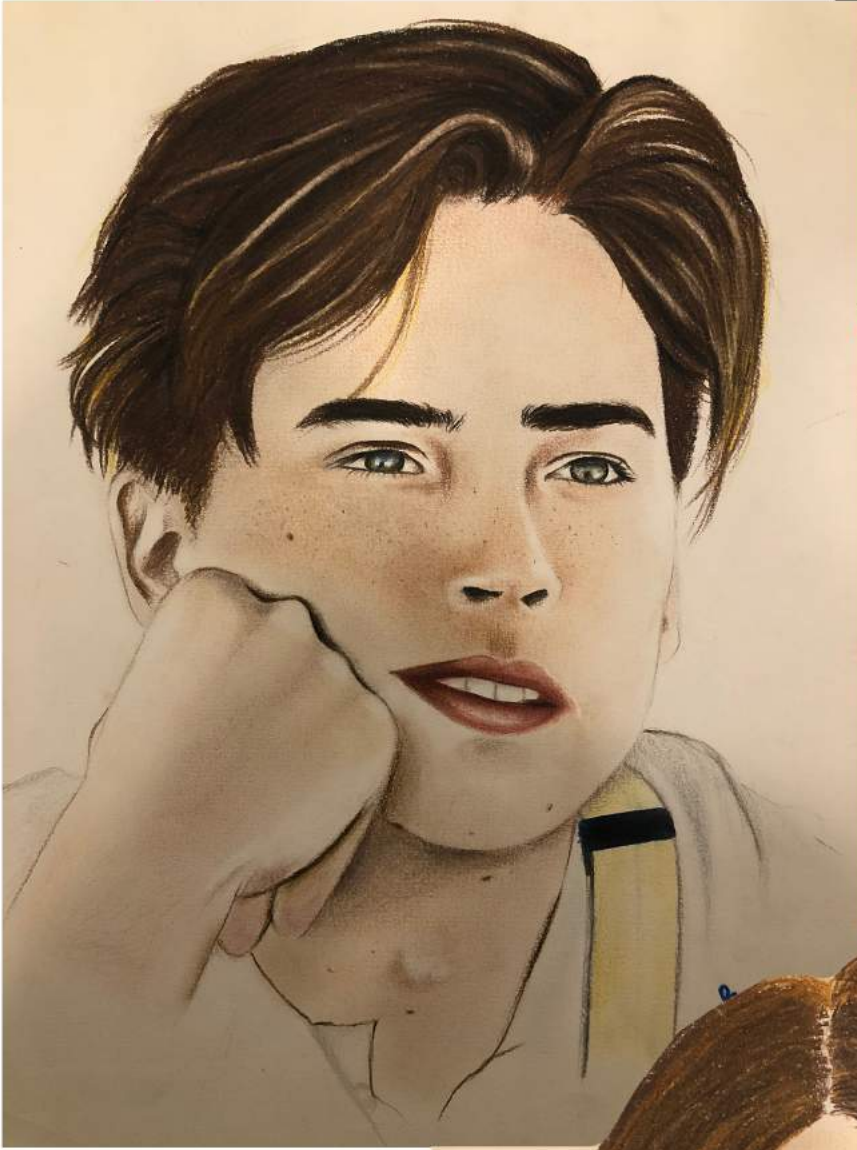And set your soul free

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Rohit Nabis Das
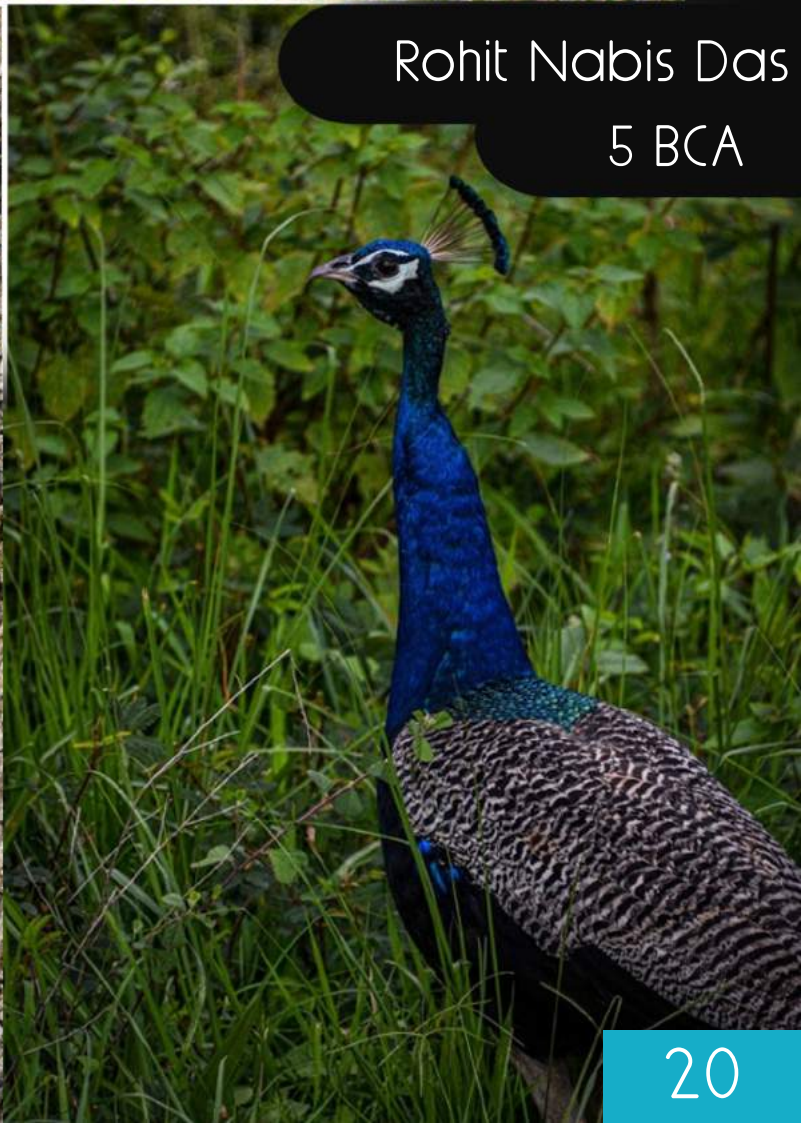
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SWAY, WHIRL & TWIRL
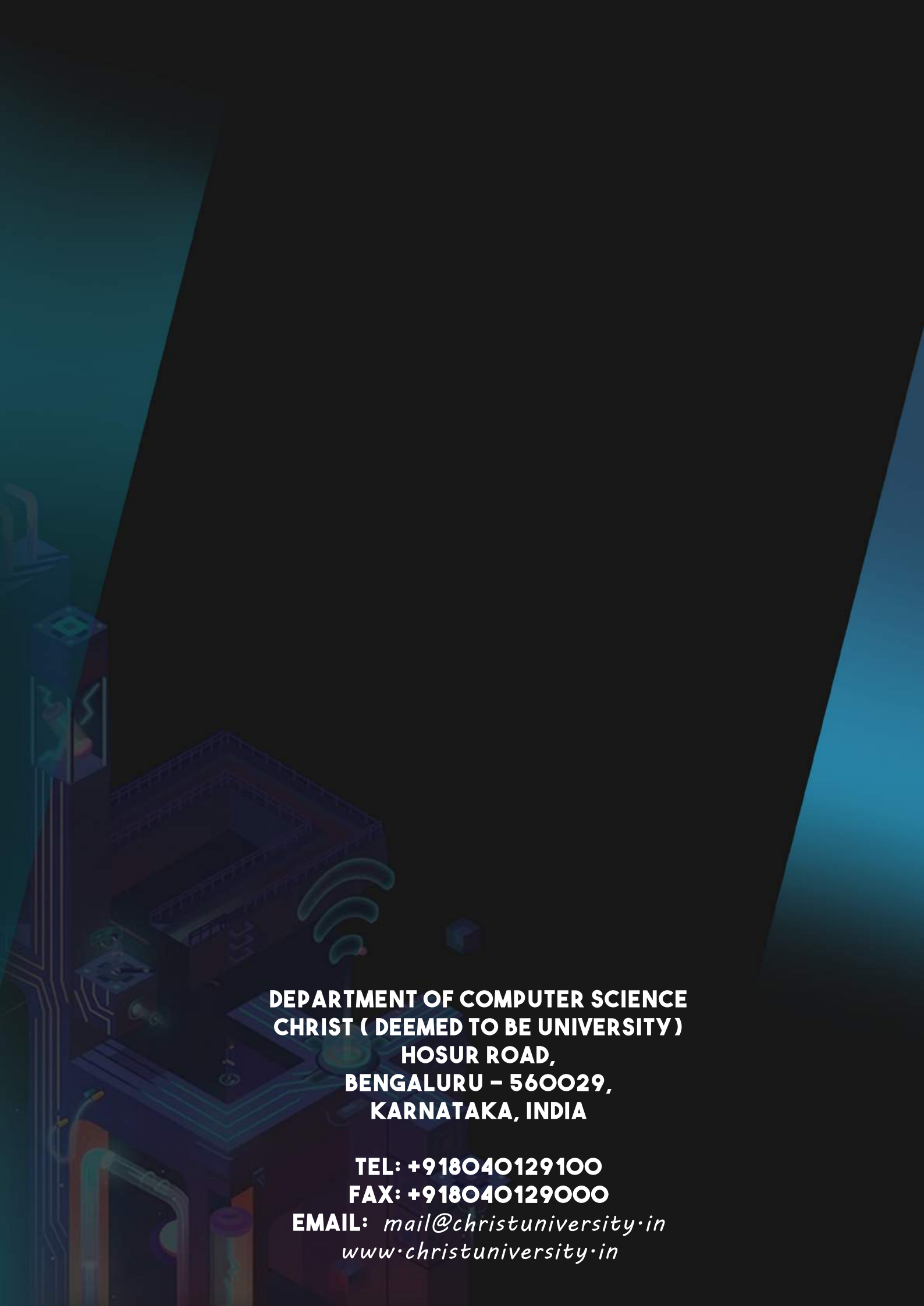
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