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DEPARTMENT OF COMPUTER SCIENCE

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Message from the Vice Chancellor

Technology has advanced to new heights, and with that has come new innovations. We are living in a universe of technological advancement. From the invention of the Internet to the development of mobile phones, technology has evolved tremendously. We live our lives using technology, whether it is mobile phones, computers or televisions.We are so dependent on technology that we cannot imagine our lives without them.

New technology is springing up in every corner of the world. Every day, something new is being discovered. It has definitely transformed the way we live our lives. Innovation henceforth seems to be something that can never truly die because technology will always be developing and upgrading to bring us more convenience and luxury.

We're living in a cutting edge era with incredibly complex gadgets, and powerful software that allow you to do things that weren't possible even fifteen years ago. The future is here and it's getting better and better every single day. As Daniel Bell would say "Technology like art is a soaring exercise of the human imagination."

The Infobyte magazine of the Department of Computer Science captures this interaction between technology and human beings for its 21st edition in 2021. I congratulate the students and the faculty of the department for creating a platform to learn, reflect and record such insights.

Wish you the best!

Dr. Fr. Abraham VM
Vice Chancellor

Message from the HOD

"It's not that we use technology, we live technology."
– Godfrey Reggio

Technology is changing faster than we can think. We live in a 21st Century world where technology is like water - we can't live without it! With technology growing by leaps and bounds, we get to experience new technological advancements every day. This presents new challenges and also allows us to do new things that we couldn't previously imagine.

Technology impacts every aspect of our lives. From entertainment, transportation, communication, to education and personal safety, technology is omnipresent. Today, technology is all around us and it's hard to imagine our life without it. It's impossible not to think about the fact that we're living at the most innovative and creative time in history.

Through this magazine this year, we aim to acquaint our readers with what the industry is using and expecting their future employees and entrepreneurs to learn. Our 21st edition of Infobyte is packed with scientific articles and innovative pieces about growing technology. Every article in the magazine explores a new step of technological development from an intriguing angle that keeps you interested from cover to cover.

We express our huge sense of gratitude to the authors, photographers, artists, and poets who have expressed an interest in contributing high-quality content to the magazine. We hope that through an immersive reading experience, readers will be able to learn about new and exciting innovations and imbibe a technological temper.

Dr. Joy Paulose
Head Of The Department

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IoT Technology

The Internet of Things (IoT) began as a concept in the early 2000s, but as we approach the year 2022, indications show that this technology will be here to stay. According to reports, 75.44 billion IoT devices will be deployed globally by 2025. The IoT is ready to consolidate its hold on our businesses and daily lives. The Internet of Things, with over 30 billion linked devices, has largely altered the paradigm of interaction between intelligent solutions, physical items such as household appliances, and technological gadgets, supporting us in improving our everyday lives.

Focus on Security: Security has become a predictable issue in the modern day, and with emerging technology, businesses must ensure data security in order to keep their customers' attention. As a result, IoT is projected to prioritise security in the future decade in order to address complex difficulties. With a variety of devices, IT managers are often unaware of the number of devices linked to their networks, making them vulnerable to attacks.

AI meets IoT: The combination of AI and IoT has the potential to reimagine how productions, and businesses conduct their day-to-day activities. AI-powered IoT enables the creation of intelligent robots capable of simulating intelligent behavior and supporting in decision-making with little or no human contribution. When AI is integrated into the IoT, it enables devices to evaluate data, make judgments, and act on that data without human intervention. Tesla's self-driving vehicles are an excellent illustration of IoT and AI in action.

Blockchain in IoT: Blockchain technology, also known as distributed ledger technology, appears as a viable method for ensuring data security using encryption techniques and direct peer-to-peer communication without the need of middlemen. It is one of the most significant IoT developments because it addresses significant IoT scalability and security problems. Due to its extraordinary capabilities and benefits, blockchain is a game-changer in the information space, providing a mechanism for data to be recorded and shared by a user's community.

IoT technology will surely provide practical answers to the many difficulties and issues encountered by those working in hazardous environments. The lower cost of IoT-based sensors and connectivity, consumer need for a better shopping experience, and growing use of smart payment solutions are all important drivers driving IoT solution adoption in the investigated market.

Dr. Arul Kumar N
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Is India ready for the Robot Revolution?

What pops into your head when you hear the term ‘Autonomous Robots’? Perhaps you might think of a bunch of Autobots defending the human race from the Decepticons as in the movie Transformers. However, in reality, they are automatically controlled and reprogrammable machines that perform behaviours or tasks with a high degree of autonomy. Any artificially intelligent machine that can impersonate man is an autonomous robot. Based on the three key concepts of perception, decision and actuation, an autonomous robot can perceive its environment, take a decision on its own and then actuate the movement based on its decision. India has always been a pioneer in technological advancements with its share of smart developers and smarter consumers. With the autonomous robots rapidly making their way into a new era, Indians along with the entire world are going crazy over this beautiful gift of science. The Make-In-India campaign, perfectly serving its purpose, seems to promise a rosy future of Autonomous Robotics in India.

The National AI strategy by the National Institute for Transforming India or the NITI Aayog has set up a three-tier plan to address the challenges lying in the Robotic Sector for India. Firstly, it plans to undertake the exploratory proof of concept AI projects. Secondly, it strives to build a thriving ecosystem with the support of new start-ups and mature enterprises. Finally, it aims to create a multi-stakeholder and multinational approach to share the best practices and innovative operating models with the other developing countries and make an innovation hub for emerging economies towards the ultimate goal of ‘AI for All’. Indian workers are completely ready to welcome the new technological advancements with a broad smile, says the Accenture Strategy Research. Realizing the untampered potential of India to shape the global robotics dynamics and technological landscape, World Economic Forum has partnered with the Government of India to set up the Centre for the Fourth Industrial Revolution in India at Mumbai, Maharashtra.

According to the Forum President Børge Brende, the Centre will "work to accelerate the development and implementation of governance protocols for emerging science and technology to best serve citizens, society and the public at large." As research in India is still in its infancy, the two-tiered programme to set up CORE (Centre of Research Excellence) and ICTAI (International Centres of Transformational AI) has the potential to push the frontiers of technology development, by fostering institutional and peer-to-peer collaboration.

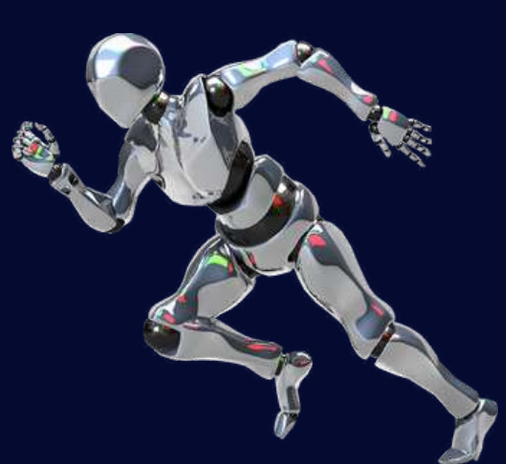
Acknowledging India's contribution to this Robot Revolution is unavoidable. It has managed to create astounding humanoid robots like Mitra and Manav. Daksh by DRDO- to be used by the Pune Police Force for bomb detection and disposal, IRA-to provide assistance to customers at HDFC Bank, KEMPA and RADA, the airport robots and INDRO are some of the brilliant works of the Indian minds. With the future prospects of creating Mind Controlled Robots by the ASET Training and Research Institute, Hi-Tech Robotic Sytemz Ltd.- the driverless shuttles, Arya-the chai making robot and Dr. Robots, the autonomous robots seem to be long time players in the Indian markets.

Naresh Kantoor, managing director of Gurugram-based Encon Systems International, a firm that assembles industrial robots, trivialises the fear of blue-collar jobs being under threat with the unprecedented growth of industrial autonomous robots and says that these machines do not pose a threat to jobs and can instead lead to a higher productivity. He gleefully declares that the onset of Robotic Revolution in India will bring with itself new jobs like robot operators, robot programmers, robot maintenance engineer and technicians.

The right approach to the robotic future is developing an open mind and keeping up with the updates. The issues of unskilled Indian labour as a result of the brain drain, lack of resources, low capital investment, poor infrastructure and new dynamics of competition seem to pose as major obstacles in India's dream to lead the Global Robot Race. We need to provide proper platforms for students aspiring a career in Autonomous Robotics with better and efficient universities to provide well-curated, technology-enabled graduates. The NITI report posits the creation of a National AI Marketplace (NAIM) to overcome the barriers of development and deployment.

Exploring the contours of topics like this requires our artists, lawyers, activists, politicians, technologists, and business leaders to come together. It is rightly said that technology is far too important to be left to the technologists alone. With cautious optimism and well-defined design principles, we can march to the apex of technological ability and advancement around the globe.

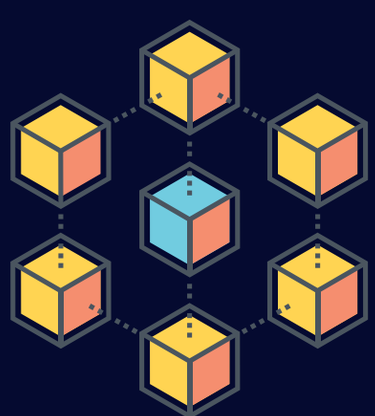
Vanshika Khare
5CMS



Tour de Blockchain

Recently there has been a lot of buzz around cryptocurrencies, crypto here, crypto there, investing in crypto, buying crypto selling crypto. In fact, even billionaires like Elon Musk and Mark Cuban are diehard fans of crypto, influencing its volatility. While some people bid on their bitcoins and ethereums, most are unaware that there's such an innovative technology driving the cryptocurrencies behind the scenes. Yes, 'The Blockchain', the technology that's revolutionizing the world just like the internet did back in 1990s.

As per Wikipedia, "a blockchain is a growing list of records, called blocks, that are linked together using cryptography." Before breaking down blockchain, let's talk about some cryptography. A hash is a unique string of random characters of fixed length which represents a unique string, for example, the hash of the string:
"We are talking about Blockchain"
is "0dcc4460653b14203a592675798b8757a61ac5dda5277a6ee03d68d2809ba1f5". This is achieved through a hashing algorithm like SHA256. Let's keep the block simple. A block contains a hash, a set of transactions like "Alice sent 1 bitcoin to Bob", a random number, and some other metadata about the block. So, the hash value of the block is dependent on the set of transactions, the hash of the previous block, the random number which is also called a nonce value, and some other metadata of the block. Thus, if any of those attributes are changed or altered then the resulting hash doesn't agree with the block's hash. Therefore, the term mining is actually the process of guessing this nonce value such that the resulting hash with the nonce and other entities of that block matches the block's hash. Once that happens, a new block is created with its unique hash, its own set of transactions, and other sets of attributes. Hence, if any of the attributes of the previous blocks are altered then the next consecutive blocks will not agree with that change and become invalid blocks. We hear that blockchain is 'distributed', which means a copy of the same chain of blocks are distributed over to other computers in the network, and if any of them gets altered, it can be easily identified with the help of these copies.

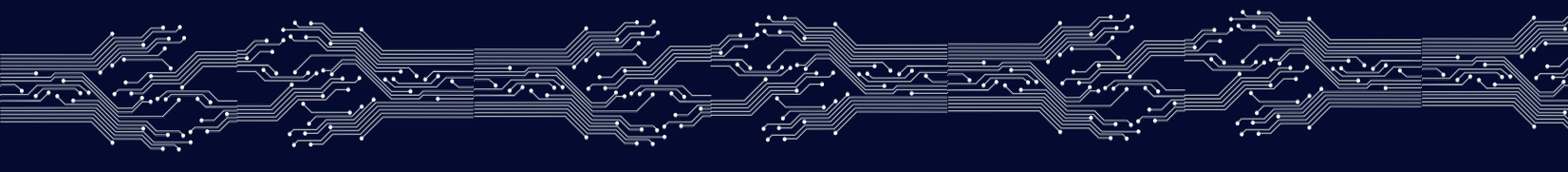


A wallet is defined by its private key, just like your key to your cryptos. If this key is known to someone they can access your cryptos, just like losing your debit card with your pin written on it. The private key is used to access your wallet and hence your cryptos. This private key of your wallet is used for generating your unique address in the blockchain which is used to send and receive cryptos just like an email address. Therefore, the wallet's core function is to create, store and use your private key.

So, when Alice is sending bitcoins to Bob, a transaction message is generated which consists of the sender, recipient, and the amount being sent. This will be signed with Alice's private key for verification of identity and can be achieved through Alice's public key. Hence, a unique string of random characters is generated uniquely for this transaction after the signing, basically, a hash representing this transaction.

Let's move on to the next step 'Broadcasting'. In this process, the unique transaction file is sent to basically all the nodes or computers in the network. This is done to verify if the transaction is legit, that is, checking if Alice actually has 1BTC in her wallet and her signature is verified. The transaction file is sent to different computers in the network and they also verify the transaction. Now that the transactions are verified but not yet confirmed, these types of transactions are stored in a space called 'Mempool', just a holding area of the transaction before it's confirmed. Now, Alice's transaction can be actually tracked through a tool like a block explorer where all details regarding every transaction happening in a specific blockchain network are shown. If Alice's transaction is unconfirmed, there is a possibility of the transaction getting canceled or never being entered into the ledger of transactions that is the blockchain.

Now, comes the miners who are the ones actually creating a block. They pick transactions from the Mempool and group them together to create a block of transactions. Usually, there are a lot of miners competing with each other to create a block. Creating a block in the sense that they are competing to guess a simple number to get a specific hash. This is a highly CPU-intensive process and can be achieved only by a miner with more computing resources and so the miner with a powerful computer basically creates a new block which becomes a part of the blockchain and contains all the confirmed transactions.



As there is no centralized authority to update the ledger, there are different protocols for deciding which node or computer in the network is going to create the next block. One such protocol is known as the Proof of Work. Proof of Work protocol is a method by which somebody can prove that they have engaged in significant computational effort. This is a very effective method to easily check whether an entity has really worked on something. This type of protocol was originally used to detect spam emails. A normal sender would send a simple message while a spammer would send lots of messages thereby utilizing comparatively a bit higher computational power. Thus, a miner spends a lot of computational power to guess a random value of a CPU intensive math problem. If the miner is able to solve the problem, they get to update the ledger with a new block with all the transactions added to this block and is then rewarded with cryptocurrencies. That's how Decentralisation is maintained, which means a single person or a group does not regulate the blockchain, but the one who cracks the math problem does.

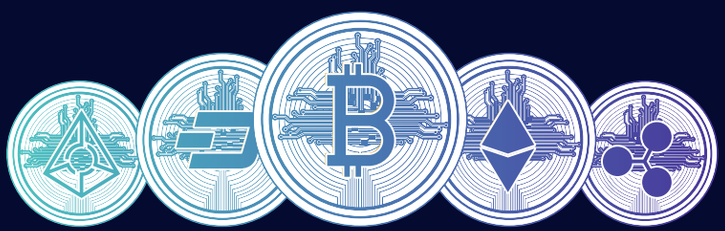
While Proof of Work is a good way to decentralize the updating of the ledger, it’s very CPU intensive. As a result, lots of mining farms are being constructed which consume a lot of energy to just guess a number leading to an environmental problem. Therefore, modern blockchains like Ethereum have come up with a protocol known as Proof of Stake. In Proof of Stake mechanism, some amount of funds are deposited on a node in the network and similar to a miner, the nodes stake or deposit some amount of cryptos with themselves here. Based on the proportions of stakes and other sets of rules, the one to create the next block is decided.

Apart from the ledger concept, blockchain offers an innovative, secure, and trustworthy way to handle contracts. Smart contracts are just the digitised encrypted form of real world contracts. A contract is an agreement between two parties on which they rely on to resolve some future promises. In blockchain, we have the privilege to write and deploy code on the chain which acts as a contract. For example, let’s say Alice wants to send 10 BTC to Bob monthly until her wallet has 50 BTC left and then stop. This logic can easily be implemented and deployed on the blockchain network. Hence, even if she wants, it will be impossible for Alice to send more bitcoins to Bob. Once the smart contracts are written and deployed, it is impossible to alter the same.



All the internet giants have clung to some innovative technology of the past and got an opportunity to embrace the tech and release its benefits to the world. Entrepreneurs have a plethora of ways to tinker with blockchain and bring out innovative solutions to solve the current problems of the world. Due to the decentralised, secure, and trustworthy nature of blockchain, it's all set to cause disruptions in various sectors, especially fintech. This technology can be a gamechanger in solving humanity's worst crisis like poverty as countries like Venezuela and Finland have used the benefits of blockchain for the benefits of mankind. It helps people living under an unstable government, it helps refugee seekers get their asylum, and also gives rise to new job opportunities to people working in the tech industry. There is a lot happening in the blockchain environment and a lot more is yet to come.

Rohith EP
5 BCA



How AI can help the way we flow?

Around the world commuters spend several hours stuck in long traffic jams, sounds of horns, warm polluting air piping from the exhausts into the atmosphere from all the vehicles lying in the same place are a common sight, According to a report from businesstoday.in, Bengaluru people spent 243 hours on average in traffic in 2019 and the same year, a report from TomTom, one of the leading independent geolocation technology specialists in the world, Bengaluru ranked No. 1 on a 2019 and No. 6 on a 2020 list consisting of 416 cities across 57 countries on its traffic index list. These are overwhelming figures from one city alone, AI can help us solve this problem.

An adaptive traffic control system developed by researchers at the Robotics Institute, Carnegie Mellon University, has been rolled out around Pittsburgh, their Surtrac technology is being used at 50 intersections in Pittsburgh and since launching, it has reduced wait times at intersections by up to 40%, according to the company. It also claims that journey times in the city have fallen by 25% while vehicle emissions have dropped by up to 20%. So how does this system work you ask? Well, the system uses video feeds to automatically detect the number of road users, including pedestrians, and types of vehicles that are at intersections. The AI software then processes this information second by second to come up with the best way to move traffic through the intersection, changing traffic lights depending on the most optimal way of keeping traffic moving. Implementing these technologies in slow-moving traffic cities after rigorous rounds of testing can help us move faster. Speaking to the Times of India in an article dated November 9th 2021, Karnataka chief minister Basavaraj Bommai has promised to introduce AI traffic signals for seamless travel in Bengaluru.

Another way our roads have disappointed us are potholes! According to the Ministry of Road and Highways, India, A total of 3,564 road accidents took place in 2020 in the country due to potholes, this is the lowest in 5 years with the highest being in 2017-9,423. The main damages caused by potholes to vehicles are Tyre and wheel damage, Misaligned suspension, Body and exhaust scrapes etc. Alejandra Vasquez and Ericson Hernandez students of Loyola Marymount University in Los Angeles, California, collected data on the streets of Los Angeles using a camera mounted on a car, they built a model using TensorFlow, Google’s open-source machine learning tool to develop a model that could quickly identify potholes, road cracks, and other bumpy sites with a high rate of accuracy. This means that workers can spend less time manually searching for potholes and can quickly start fixing them. Implementing such technologies in our cities, can help us move faster, worry less about arrival time and vehicle damage and can reduce pollution!

Mohammed Mueez Mamoon
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Python Inheritance

Inheritance is one of the most important aspects of Object-Oriented Programming (OOP). It is what makes Python stand out apart from other programming languages. It helps the user to be related to more real-world concepts. Even though inheritance is being implemented in different programming languages, Python is the one in which it is used in its true meaning.

Inheritance gives the user the ability to re-use the program code. Instead of writing the same code more than once in a program, the user will inherit it from one class to another. It saves the user's time, effort, and LOC!

Theoretically, inheritance is the technique in which a class can inherit or acquire the properties, mainly attributes, methods, and such, of other classes. The class whose properties are inherited by another class is called the Parent class, and the class that is inheriting the properties from another class is called the Subclass or Child class. When a subclass inherits all the properties from its parent class, it establishes a relationship between them. Suppose if there exist three classes X, Y, Z, and X class inherits all the properties of Y class, and Y class inherits all the properties from Z class, then transitively X class inherits the properties of Z class as well. This technique is called Multiple Inheritance.

There are mainly five types of inheritance:

1. Single Inheritance: permits the subclass to inherit the properties of only a single parent class and not more than that.
2. Multiple Inheritance: permits a subclass to inherit all the properties of more than one parent class.
3. Multilevel Inheritance: permits the subclass to inherit the properties of a parent class which is a subclass of another parent class, and so on.
4. Hierarchical Inheritance: permits several subclasses to inherit the properties of a single parent class.
5. Hybrid Inheritance: a combination forming more than one inheritance type.

Lakshmi S Lalu
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Why Business Fails In Machine Learning? It's Easy If You Do It Smart

Introduction:- A key part of understanding how machine learning works is understanding what a machine learning model is. A machine learning model is a set of rules that allows computers to analyze data and then make predictions. In order to ensure your business is prepared for the future, you need to understand these factors. While it is still difficult to predict what exactly will happen in a machine learning scenario, you'll be better prepared.

Easy way in understand how business fails in machine learning

When people hear "machine learning," they seem to imply that there is only one discipline involved. There are two of them, and businesses that don't know the difference can find themselves in a lot of difficulty.

Imagine hiring a tailor to build you a tailoring sewing machine for you. When it comes to machine learning, that’s the kind of mistake we see businesses making over and over.

If you’re starting up a boutique, it’s a great idea to hire an experienced tailor well-versed in the nuances of stitching beautiful designer dresses. You’d also want a sewing machine. While it’s a critical tool, I bet you wouldn’t charge your top designer dress with the task of knowing how to build that sewing machine; so why is your boutique focused on the equivalent for machine learning? Are you in the business of stitching designer wear? Or making sewing machines?

What they don't tell you is that all of those machine learning classes and texts are about how to create sewing machines from the ground up, not how to stitch and experiment with new designs.

If you create machine learning algorithms, you're primarily interested in making tools that people can utilise. Machine learning research is the name of the game, and it's usually carried out by academic institutions or Google.

When it comes to machine learning all business people will assume it wrong and it fails.

Since this area of employment has such a long history, it necessitates a substantial amount of knowledge. Some well-known algorithms have been around for millennia. The least squares regression approach, for example, was first published in 1805. Trust me when I say that humanity has come a long way in the last 200 years.

There are some really advanced gadgets on the market today... How can you make better sewing machines if you don't understand how this one works? Of course, you'll need all of that in-depth research! It takes years to become a researcher, which is why the 101 course begins with the fundamentals of calculus.

The majority of enterprises simply want to start stitching — to solve their problems. They have no interest in selling sewing machines, but they frequently make the error of attempting to manufacture them from the ground up. It's difficult to blame them; the present hype and educational cycle is heavily weighted toward research rather than implementation.

Don't reinvent the wheel when it comes to design development. Those sewing machines already exist. You may find them for free on a variety of sites. If you don't want to put up your own machine learning , Google Cloud Platform lets you use theirs, which includes designers.

Smashing with machine learning

Unfortunately, many businesses fail to understand the potential of machine learning because they don't realise that the applied side is a whole separate field from algorithm research. Instead, leaders try to start their boutique by hiring people who have spent their entire life building sewing machine parts but have never stitched anything. What's the worst that might happen? If that works out, it's because you got lucky and hired an engineer who also happens to be a fantastic tailor.

In most cases, though, you will not be so fortunate. There are only so many hours in a day, and if you spend them studying how to set up a sewing machine, you'll have less time to perfect the art of business. Where — and when! — would your PhD-trained artificial intelligence researcher have learned the skills needed for machine learning applications? No surprise you're whining about the talent scarcity if you've set your heart on the hybrid who is an expert in both!

Owing the proper team for the job

If you're selling cutting and making designer wear, hire researchers. If you're innovating in designing to sell clothes at scale, you would like people that find out what's worth stitching / what the objectives are , people that understand the suppliers and therefore the customers, people that can process ingredients at scale (data engineers and analysts), people that can try many various appliance combinations quickly to get potential designer wear (applied ML engineers), people that can make sure the standard of the design is worth enough to wear (statisticians), people that turn a possible designs into many served efficiently (software engineers), people that keep the interdisciplinary team on target (project/program managers), and other people who make sure that your clothes stay top notch albeit the delivery van brings you plenty of orders from customers. While these needn't be separate individuals, make certain you've got each role covered. And before you fling your normal clothes at me for providing such an incomplete caricature, I'll freely admit that there's far more to mention about hiring for applied machine learning. I've outsourced that to other posts, including this one.

Speaking of outsourcing, if your team has tried all existing tools and can't make a better fashion designer that meets your business objectives, it is sensible to believe in adding skills in building appliances (researcher). Whether or not you hire that person to your permanent staff or outsource the work to an experienced algorithms research firm depends on the size and maturity of your operation.

Another reason to associate with researchers is that your prototype is so successful that using custom-built appliances is sensible at the huge scale you're lucky enough to work at. Experts should be talking about this, but they aren't. They're not owning up to the very fact that there's really two machine learnings here, then the planet is training people in building these algorithms but not in using them.

My team is functioning to repair that. We've created a replacement discipline to hide the applied side and we've already trained over 15,000 staff members in it. We're calling it decision intelligence engineering, and it spans all the applied aspects of machine learning and data science.

To put it differently , if research machine learning is building sewing machines and applied machine learning is using sewing machines, decision intelligence engineering is using a sewing machine safely to satisfy your goals and using something else once you don't need a sewing machine.

Kowshalya.B.S

3 CME

Future of Cryptocurrency

We've been seeing a large interest and growth of crypto currency all over the world. From investing, to mining, to trading, and now also for purchases, cryptocurrency is emerging as a potential future currency for the world. So the first question that arises is what is cryptocurrency?

At present the money transactions from one person to another person go through financial institutions such as banks. The invention of cryptocurrency empowered by blockchain technology has allowed transactions without the need of intermediary institutions. Through cryptocurrency, users can directly send money.

The first cryptocurrency was Bitcoin , invented by ‘ Satoshi Nakamoto’ . Nobody knows ‘ Satoshi Nakamoto’. I guess the reason for Nakamoto’s anonymity is the fact that creators of alternative currencies are likely to attract the attention of authorities and criminals. Also before the mine server ban, the mining rate was in Satoshis per hour. A Satoshi is also the smallest unit of Bitcoin currency. 100 million Satoshis are equal to 1 Bitcoin.

Now how does it exactly work?

In Layman terms, Every transaction of the coin is stored as a block, and all the transactions for the particular coin are connected like a chain, hence the name Blockchain technology. All these details are available in a public ledger, which can be accessed by anyone. For every coin, we can know the transactions of its exchange.

After the invention of bitcoin , there were the emergence of similar cryptocurrencies such as Etherum, Ripple and the current popular being Dogecoin. Since the code of bitcoin is open source, anyone can read the code and make their own version of cryptocurrency with their own modifications. If you have the knowledge and experience about crypto trading, then you must know that there are different generations of cryptocurrencies.

- First generation – Bitcoin
- Second generation – Ethereum
- Third generation – Cardano

PRO’s:

- Lower fees: Since they do not have regulatory bodies, it is a type of decentralised currency. So, the transactions require much lower fees.
- Difficult to hack: Every transaction will be recorded in the public ledger, and it is almost impossible to modify these details by hacking because if someone modifies the details of one block, other blocks which are connected to it won’t accept the modifications. To make it work, one has to hack all the blocks in the chain, which is difficult.

- Boon for weaker economy countries: Cryptocurrency can be a very good alternative for countries with weak economies. It is because of the simple reason that a weak economy results in the fall of currency value which in turn means that the country would need to pay more money to other countries for trade, service etc. But if they use cryptocurrency, they can avoid the situation to some extent because the value of cryptocurrency depends on international demand and not the national economy.
- It can provide protection from debased currencies and the threat of rising inflation.

CON's:

- Very Volatile: Cryptocurrency is very volatile and has the potential for large losses. Cryptocurrency has no value of itself and it depends on its demand. For example if 100 people want to buy bitcoin then the demand of bitcoin will increase but if these 100 people sell their bitcoin to invest in another cryptocurrency say dogecoin then the value will decrease. So for this issue we cannot be totally reliant on cryptocurrency.
- Limited acceptance of cryptocurrency : While bitcoin and some other cryptocurrencies are now accepted across a growing number of payment platforms, the number of places where one can exchange cryptocurrencies for real goods and services remains very limited.
- No law to govern them:Cryptocurrencies are a construct of the private sector with no official oversight. This means that they are wide open to being exploited by criminals. There is no international law to govern the same unlike the money you save in a bank. For example, If you lose your virtual coins then nobody can retrieve them for you .
- Cause of illegal activities:In public ledgers, personal information is not required. Because of this, cryptocurrencies are being used for illegal activities like drug dealing etc

Right now it is still in its initial stages and the technology is constantly evolving. So if it is evolved in such a way that the loopholes are solved, it can be a very viable option and may compete with formal financial institutions.

Currently, people are looking at it as an expectation to become rich by investing and mining in them. Whatever your interest or motivation maybe, experts stress the importance of making sure you understand the unique volatility and risk factors of cryptocurrency before investing.

Even if cryptocurrency faces extinction, it is a very useful technology because of the blockchain system. Be mindful, we have the fourth generation of blockchain also coming up soon and this battle is going to get even more interesting. As we are not potentially getting to the phase of increased adoption, winners will emerge faster – or, let's say losers will fade away faster!

Khushi Agarwal

1 BCA

Analytics Paralysis

The phrase “Data Analytics” has been used as a buzzword in a lot of publications, printed or otherwise. It has been used to talk about a lot of different processes used by both, early-stage startups as well as multi-billion dollar corporations. Thus, it has the potential to intimidate those who are just starting in the startup sphere. If you have just started trying to get your startup off the ground, there is no reason to fear this, apparently very complicated process. Instead, you should realise that it could give you the advantage you require to push your product development forward quickly and in a focused manner.

Using analytics will help you immensely in evaluating your product-market fit. That is to say, it will help you know whether your product serves your chosen market and if not, what market it might fit better to. Analytics also assist you in focusing your efforts in a particular direction. If you are a 2 to 3 person startup, you will be able to focus on the parameters that you need to drive up to increase product adoption. If you’ve grown to a startup with different teams, then it aids in deriving specific indicators each team might use to gauge their performance. Therefore, it is invaluable in the operation as well as to the growth of your startup. So, is it as difficult as it sounds?

Data analytics has become a lot easier now with a multitude of tools available which work together to help you create a comprehensive picture of how your startup is performing. It is no longer essential to hire a data scientist or a data analyst to parse and produce insights from the usage data you collect. It still might seem complicated seeing as how many of these tools are available in the market but there is no reason it has to be. At your stage, most of these tools do what you need them to, to very similar degrees of success and sweating it out trying to glean which would be the perfect one to use should be far from your concern. What you should concern yourself with, however, should be creating the mindset of using whatever tool suits your goals best at the given time and to change over to something else when they don’t work as well anymore. The steps to deploying data analytics are threefold in a broad manner of speaking. Each of these steps are processes that themselves contain a lot of nuances but as you read more about them and start putting them into practice, it will become clearer how each step can be augmented to fit your product and its goals. There is no ‘One size fits all’ approach to this.

You must start at the funnel. The basic model of the funnel has three stages, namely, Acquisition; Engagement and Monetisation. A music streaming platform, for example, follows this very closely. It acquires users from both, invites by other users and organic sign-ups. The key metric that guides this stage is “How many users signed up this week/month versus last?”. It is also closely followed by the Engagement stage where the key metric you could look at would be “How many users used this service this week/month versus last?” or “For how long do users stay on the app/website?” This is also known as the Retention loop where acquisition and engagement happen cyclically in order to drive up the usage of the product. Then comes Monetisation where you start charging for the continued use of the product from these retained users finally generating revenue from your product. The metric here is pretty straightforward as well, being somewhere along the lines of “Revenue earned week over week” or “Subscriptions month over month”. You don’t need a tool for this. A piece of paper and a pencil is fine as long as you are pretty sure what your specific funnel looks like.

After you set up the funnel by adapting your business model to this basic format, comes the actual act of collecting the data. Here is where you instrument your product to log certain events that indicate where a user is in your funnel. Google BigQuery, Amazon Redshift, PostgreSQL are data warehousing tools most commonly used to store this type of data that is generated in huge volumes. Tools like Google Analytics, Mixpanel and Amplitude have prebuilt APIs for most platforms that your product might run on and it makes it very easy to generate graphs and charts to see how your users are interacting with your product. They also have options to add properties to said user events so that you can derive more information about things like monetisation, type of acquisition, duration and volume of engagement etc. You could also use tools like Segment to do both the logging of these events and sending them to the analytics engines simultaneously allowing them to communicate with each other and create a coherent picture out of your data. This way you can use the best features of multiple tools without adding to the complexity of building your product.

Alright, so the funnel is set up and you are collecting all sorts of event data from your users. The next thing to do is to use this data to inform your sense of how well the product is succeeding in retention. Again, tools like Mixpanel and Amplitude have powerful report generating capabilities using the data that you gather and depending upon what you decide would be a reasonable time for users to return to your product be it daily, weekly, monthly etc., they will make it easy for you to see, both what is happening with your retention and where in the funnel it is falling off. If you are working as a team, it is also essential that all members have access to these metrics and reports so that non-technical members have the ease of understanding them and the technical members don't have to spend time translating what the data means. It would therefore be a good idea to put all these metrics on some kind of dashboard, democratising the data for all the members of the team. Also, get in the habit of compressing these reports into numbers in a small spreadsheet so that you can send these as performance snapshots to your investors or advisors so that you can ask questions on problems you have and get feedback on your proposed solutions while they have some context of your position.

Anirudho Majumdar
BCA | Batch of 2019

A Message to Future Data Science Aspirants

The word Data Science is a very trending phenomenon due to the shifting paradigm of industries to automation. The switching of smart phones and smart devices has aggravated the data storage. The plethora of data has prompted many techies to think of exploring the data and use this data for automation of things. Now techies and computer science aspirants have been familiar with the terms Big Data, Machine Learning and Deep Learning.

The principle of data science is “Think computer is a small three year old kid. You are teaching it.” A building is strong only when its base is strong. Similarly, data science aspirants must build a strong foundation of knowledge in its basics of Linear Algebra in Mathematics and Probability in Statistics. Most of the machine learning algorithms use these statistical and mathematical concepts for solving the problem. Each problem has different implementations of models. Imagine a kid learns a chapter and exams are conducted. Similarly, a model undergoes training with the help of training data and tests its efficiency using testing data. As a measure to understand the goodness of a model, we use several measures called metrics.

You might think, “What is the role of computer science in data science?” The answer is simple. The data which we train is not 5 to 10 values. It ranges upto billions, trillions of data values. Manual computation takes a span of 10 to 20 years or even more. The invention of Charles Babbage solving these computations within a day or a month, makes Computer Science a fundamental component of Data Science. In addition, the upgradation of processors and RAMs have often fastened the processes.

There are large areas in data science where you can specialize. Natural Language Processing (NLP) allows computers to understand the human language. Image processing techniques to understand and detect the images and components within an image. Visualization techniques to present the data to the users effectively and in user friendly manner.

Core knowledge in the domain where you work is the most important fundamental of a data scientist which makes you different from others. Be strong in Mathematics and Statistics. Go ahead!!!

Tejus Sri Kumar
CMS | Batch of 2020

AI: More Than A Buzzword

Artificial intelligence is becoming the most heard buzzword in recent years. Most of the things that computers do in recent years are being considered artificial intelligence. But if we dive deeper into this statement even that seems to be meaningful. This could be due to the sudden spike in the growth of technologies. As the main backbone behind this growth is data. Data is the main reason which makes us feel like everything is AI due to the fact that everything is data.

The problem is not with the saying. The term itself defines that it's trying to make computers think like human beings where it does things on its own where human intelligence is required. There are various different products being created with a base framework as they all come under AI but developing the framework in reality is very far from it. Thus, developing the base frameworks for various AI technologies is the biggest deal. The next part would be with respect to the domain and data specified which will be taken care of at the framework phase. Thus the main work lies within the framework design. As due to this framework many such similar products are developed which is were it seem to be AI everywhere.

For example, consider a chatbot. Various chatbots can be developed in hours and minutes but all these are done only using the base framework but the reality in developing a chatbot is far from this. It takes a lot of time and effort to develop a good chatbot. It usually takes time for a child to understand a conversation similarly it takes time to create bots. It should be developed with respect to the domain, product and the conversation that are expected. The main trick lies in the way to take the conversation and bring it back to the same topic. Thus AI is way more than a buzzword.

Yashiga C
CMS | Batch of 2019

DEVOPS

Combining software development and IT operations

What is DevOps?

DevOps is derived from two words, Dev: Software Development and Ops: IT Operations, so let's first understand them, and their significance in this IT world.

Software Development

What is Software development? Most of you would say writing code, well, that's only 40% of it. Only after creating software which are used in a productive landscape(Customers paying) did I realize how much more it is , I understood the importance of Quality Assurance, Testing, having a scalable (handle a growing amount of work by adding resources to the system) and yet flexible(parts like Database can be added or modified in future) Architecture, Documentation for a newbie to start working on the project, Documentation for the customer to onboard the product, tracking across team who all will be taking which features or bugs to resolve. It's a whole process from designing what to create, to creating and testing it.

IT Operations

So, now you would ask, if all those things related to software are done by software engineers, why do we even need operations? When I was in college, I used to think the same, have you thought how the software created by a developer reaches to the customer, specially in this internet age where most of the products are cloud? What about the updates and patches (minor updates for fixing bugs)? Who is responsible to make sure that the websites are always available to the customer with the least latency? Developers may check that the code runs in their system, but who checks if they run in the main server which hosts their website and manage that server so that it has the latest OS update. Answer to all these questions is the IT Operations team.

DevOps

If we have the creators and testers of code (Developers) and people to manage servers so that customers can always access the service (Operations), then why are DevOps needed?

DevOps In Action

As stated before, DevOps engineers support Developers and Operations in multiple ways, some of which are:

Scripting

A lot of components like setting up the environment (Installing tools to run the software like Java, Maven (Dependency Management for Java), Apache (Website Server)) can be done more easily by creating scripts. Once these scripts are created, they can be used to install the environment for the software and the product to multiple servers automatically using tools like Ansible.

CI/CD

CI/CD pipelines are automated steps followed for building the software(for languages like java, go and c), running unit tests on them (junit), checking how much code actually has tests to test its stability, deploying in a test server (similar to productive server), checking code quality using tools like fortify, making sure all the opensource libraries used are allowed in the organisation, running UI based tests like Selenium and deploying the product to productive system, all of this if done manually would take significant time for a developer, but these are automated by a DevOps. Example Software to achieve this: Jenkins, Azure DevOps, GitHub Actions

Infrastructure

In this cloud era, cloud giants like Amazon Web Services, Microsoft Azure, Google Cloud Platform have multiple services to offer like database, virtual machines, cache databases, and to deploy a single product, creation of multiple services across multiple providers and connecting them together needs special type of scripts, creating them is once again a part DevOps's job. Terraform is the go-to software for this. That being said, for normal case scenarios, there are services like Cloud foundry, Heroku that be used for smaller websites, but still need config files.

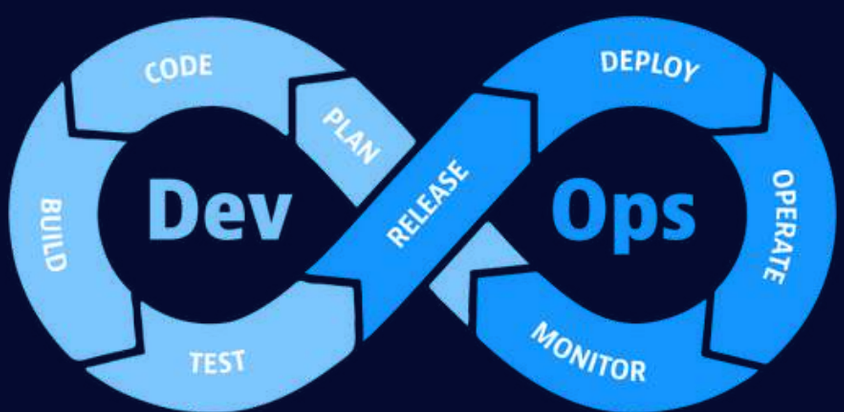
Monitoring System

Setting up a monitoring system like Grafana or Kibana and providing a way to parse logs and suitable data to this monitoring dashboard is also a task performed by DevOps.

Conclusion

There are many upcoming trends and practices which go hand in hand with DevOps like DevSecOps, SRE, DataOps etc which makes it great option to consider as a career choice. Tech giants like Google, Microsoft are really pushing at and proving tools like Kubernetes, Azure Devops to move towards the DevOps culture. Most of the companies today follow agile which integrates with DevOps on a very high level. All this makes DevOps in this cloud world more of a requirement than just a nice to have.

Akshat Ahuja
BCA | Batch of 2019



POETRY

is

the rhythemical creation of beauty in

work

Life's Ups And Downs

This poem is about the beauty of life, how everyone goes through different phases in life but is still scared of the inevitable death.

Now I sit here so old and grey.
Remembering my young days happy and gay
How I used to run across the meadows
Searching for dewdrops on the leaves near the window
That was a phase of my life where I was carefree
But soon came a phase where I was hard to agree
Teenage brought me stress and anxiety
That my thoughts were filled with curiosity
Then came adulthood where I found myself running for survival
Then came marriage which bonded me and her in body and mind
Together we created a life, Oh! she was so dear
But all I was left with was fear
The fear of having to leave her hands one day
The fear of old age and disease
And that’s what everyone foresees.

Aneeka Achu Zachariah
3 BCA

Her

She's bounded with love
She set a positive vibe everywhere she goes,
She's the sun that dispels the darkness.
She's a goddess of all three worlds

She saw us living with villains and killers as well as sinners
She withstood the pain and tears.
But, She couldn't see her children in pain and suffering

Her eyes were burning with rage and anger,
She was valiant enough to take her sword of truth from her scabbard to destroy the evil.
She was powerful as a raging volcano
Ready to melt away all that came in her way.

Damini Nijgal
CME | Batch of 2017

When I met C!

```
#include <stdio.h>
main()
{
  printf(“ It was high school when I tried to code
```

Trust me its been three years
and I can assure one thing
That my brain will eventually explode

Not the period, not the teacher
Was the terror
My mornings could be better
If there was no syntax error

If genie asked me for three wishes
Thrice my answer would be- A WAR
With those if’s and else
And loops of for

Var and Char the two dumb bowls
But such undetachable souls
If you guys didn’t sign up with switch
My lab programs would welcome you
To the zone of being “Ditch”

Mr.Variable
I could start you with a number
But I know in your life
You weren’t taught to be very humble

It was all going fine,
My programs and my brain,
But,
Semicolons are a huge mistake,

Enough of my chimp brain,
An intrigue learner,
Is always awake,

Hold up there's an irony,

With huge respect I bow,
And tell you all that,
I'm a Computer student now,

Its twelve O fifteen,
Tomorrow I have a test of C,
And I assure to attend it with no keen,

Here are the struggles,
And I hope you agree! ");
}

Rohith EP
5 BCA

A Letter To My 10 Year Old Self

Today upon going through your diary entries of 2015,
I couldn't resist myself but tell you somethings that you should know.
Don't look down on yourself you beautifully evolving queen,
Stop crying its ok to fail, because that's how we're supposed to grow.

You know, I read your first poem that you wrote,
It told me how unblemished you think the world is.
Where your happiness was your new , red and clean school coat,
10 best friends and ending the day with mum's goodnight forehead kiss.

You know sweetheart, those days When the only competition was to win the stone paper scissors game,
And all you wished for was the blue packet of lays.
Don't waste any moment being sad cause days ahead would never be the same,
Once you grow up and step into your life's real race.

Little girl, the world is not a cakewalk,
Nor it is as blithe as the cartoon series that fascinates you.
But today with you my 10 year old self as I talk,
I see the exuberant ecstasy on your face and those eyes with a passionate hue.

I won't lie because soon enough the malicious world you'll step in,
When at times you'll feel unworthy, empty and hopeless.
Materialistic things would bring you happiness therein,
When you would least care about your barbie doll and its pink dress.

But sweetheart no matter how hard things get,
I assure you'll conquer it one day.
You'll work hard, be proud and won't regret,
The valorous woman you've made me today.

Somya Chibhrani
1 CME

Chaos

Sunsets, Sunrises are water colored paintings.
The Sun and Moon feature,
As clouds float by.
Sitting on the hill, imagining what life would be.

Darkness overtakes.
Moonlight glances on the water,
Stars are little lights;
The wishing wells of happiness.

Blooming red flower bud, the white linen drenched around the edge.
Blooming red flower bud, eating away every hue from magenta to chartreuse.

We drowned in the gloom of deep blue helpless,
The next flower will bloom colourless.
Virtue without which terror is fatal,
Terror without which virtue is powerless.

My mind is a chaos
like a rebel without a cause
Twisting, and turning
tossing and swirling
one to another
hating each other

Delirious delusions
a fiddling illusion
not one, not two
not a pence, neither a dime.
just like this scribbling
nor a reason, neither a rhyme.

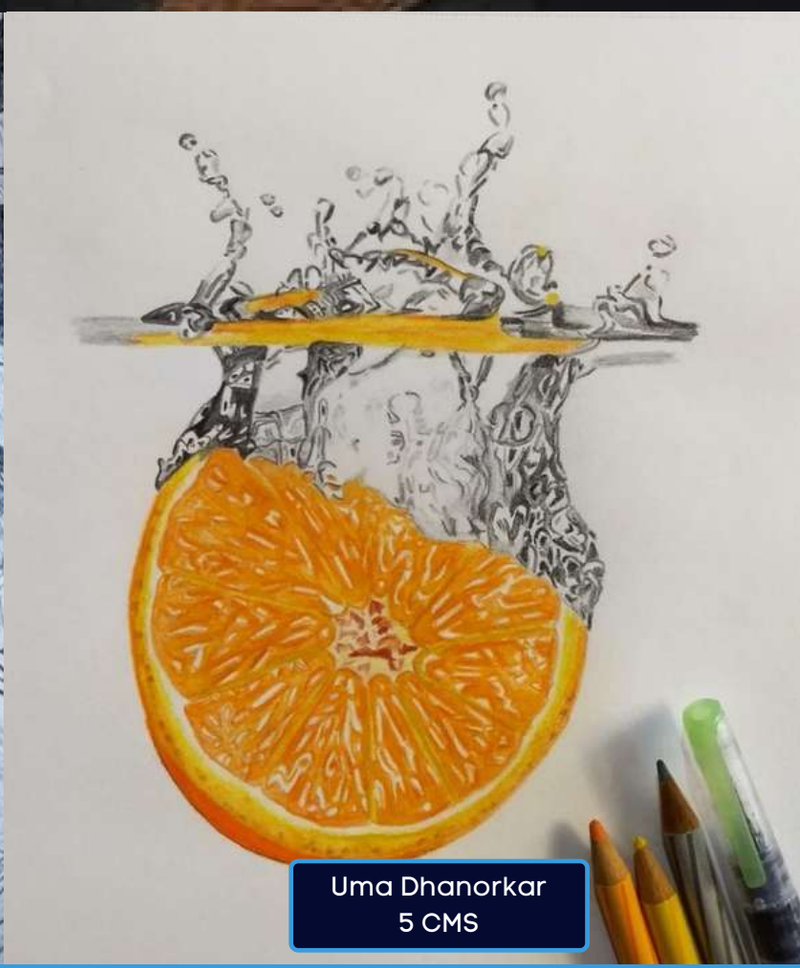
Alan Joseph
5 BCA

Spilling The Magic on Canvas

Rohith E P
5 BCA

Anjali S Naick
3 BCA

John Gilbert
5 CMS



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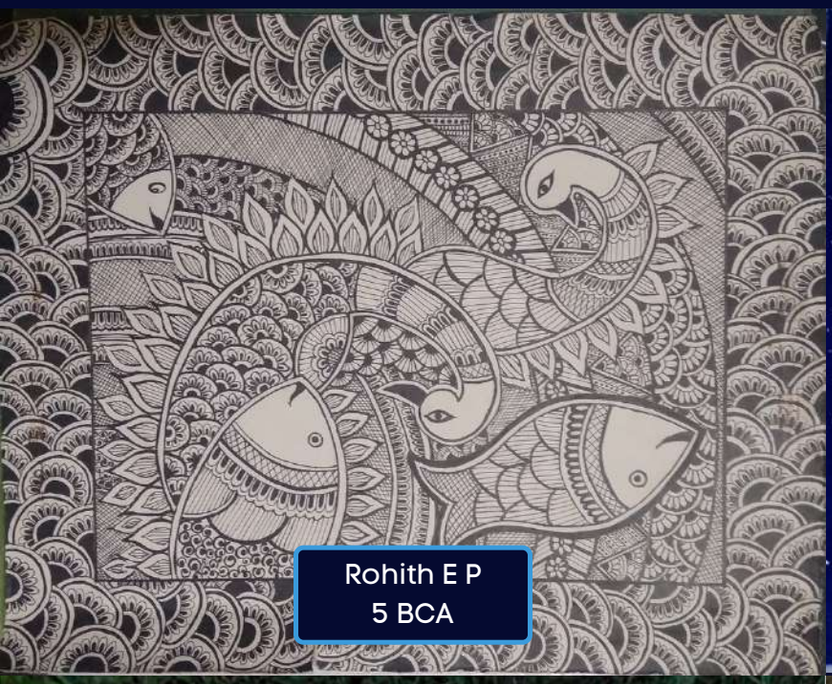
5 CMS

The Art Studio



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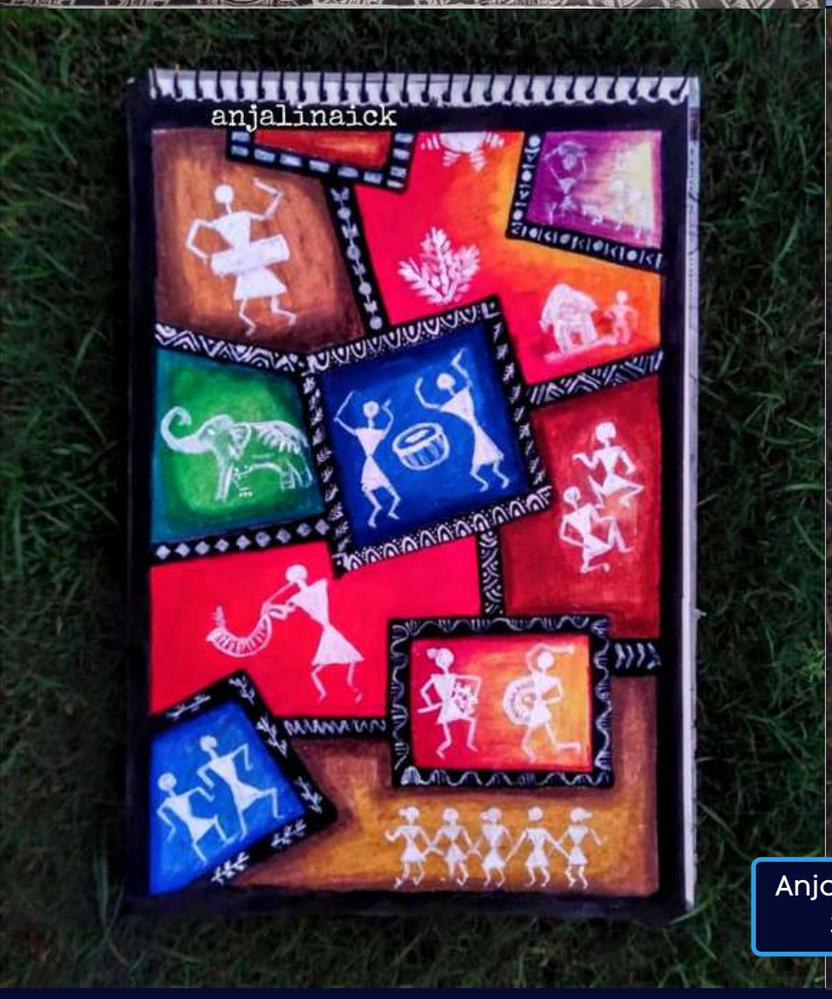

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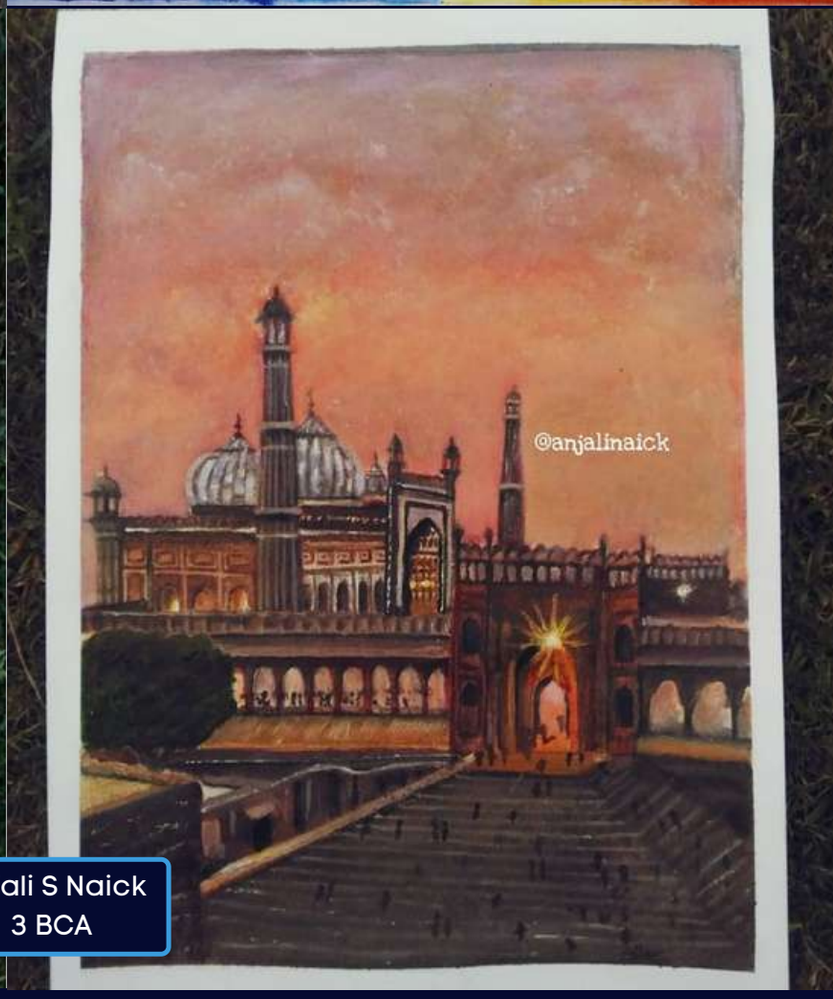
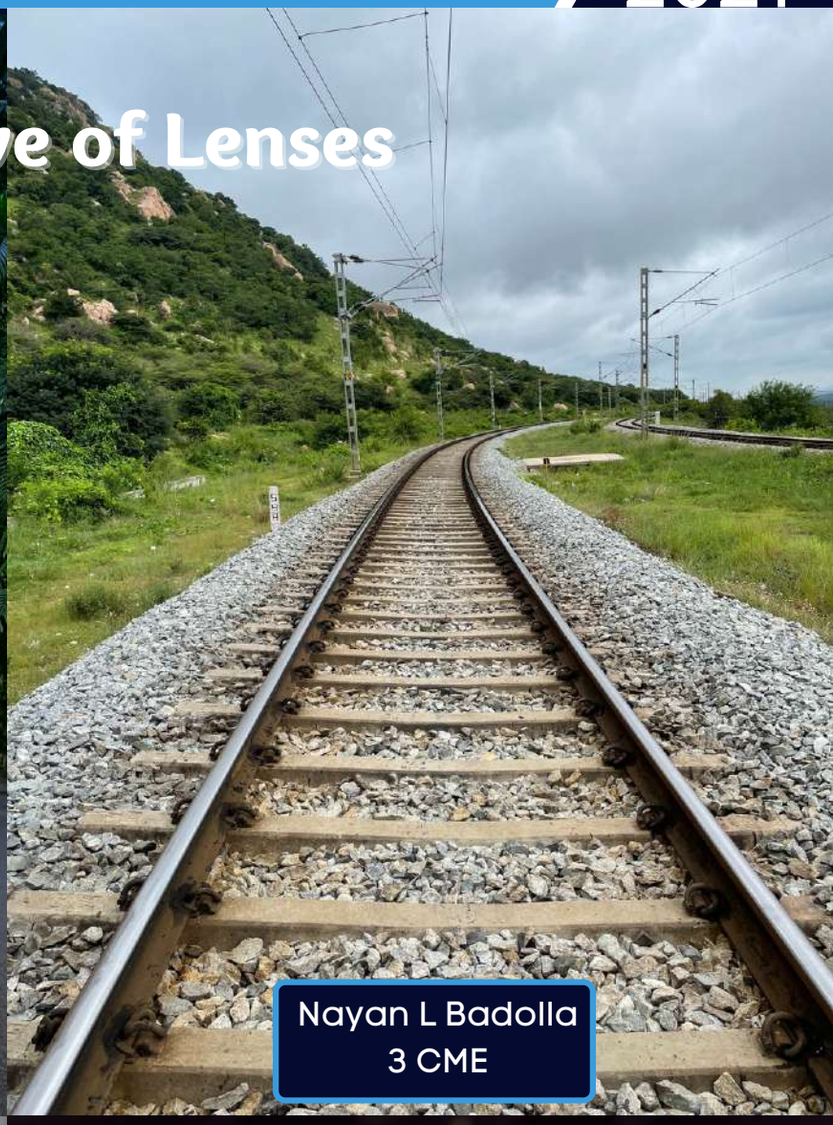


Capturing Life, one moment at a Time

Raghav Sood
3 CMS

For the Love of Lenses

Krishnend E
1 CME



Nayan L Badolla
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Nikhil Nema
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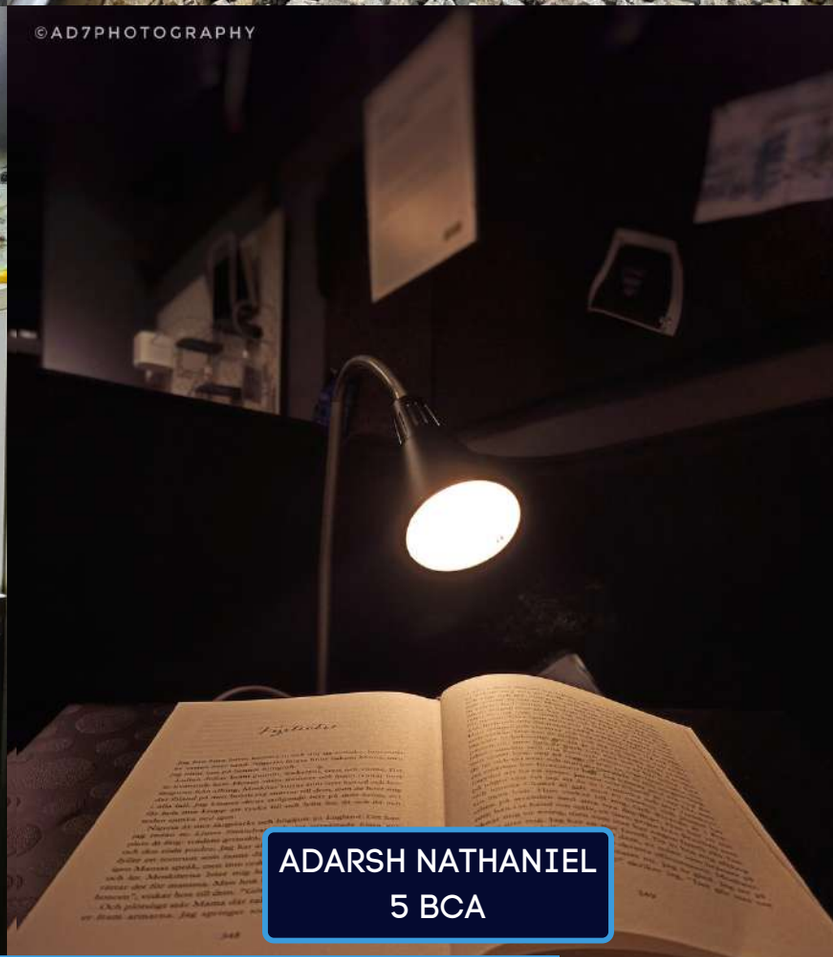

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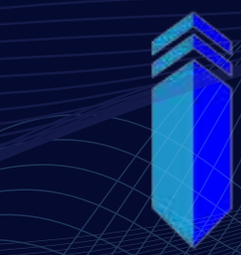

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