



# DIGITAL MINDS

Volume-8



**Bunts Sangha's  
S.M.Shetty College Of Science, Commerce  
& Management Studies**

Hiranandani, Powai, Mumbai-76

**NAAC Accredited 'A' Grade  
IMC RBNQ Certificate of Merit 2019  
ISO 9001:2015 Certified**

**Department of Information  
Technology**

**In**

**Collaboration with IT association**

**Presents**

**“Digital Minds”**

**Volume – 8**

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### ***Principal's Desk***

At S.M. Shetty we follow a very simple yet dynamic vision 'Personality Development for Nation Building'. To attain our vision, our team of professors encourages the students towards effective goal setting from the time they join the college. Commitment to the promotion and propagation of quality education with excellence is the principle of the organization.

Technology is evolving rapidly. Artificial Intelligence, geo-targeting, automation, and other advancements in Information Technology have specifically set the stage for more technological evolution. The department ensures that students have the opportunity to face the ever-changing demands of real-world situations. It is again supplemented by on-going and regular interaction with business and industry leaders, providing the students a practical platform to assess and experience the application and effective results of what is taught as concepts in their classrooms.

'**Digital Minds**' explores the innovations in technology today and compiles the thoughts and opinions that students have and foresee in the industry. It sharpens their research abilities and brings about an inventive thought process amongst them. This year the students have decoded various aspects of applications and illustrated some of the cutting edge technologies that we are going to experience. I am pleased to see the students of the IT department unravel their abilities and wish them all the success for becoming enablers for the future tech giants.

**Dr. Sridhara Shetty**  
**Principal**



### ***Coordinator`s Message***

Congratulations to the students and faculty associated to magazine committee for successfully publishing the Eighth issue of departmental technical magazine Digital Minds. Digital Minds is creating platform which provides an opportunity to the students and staff to express their original thoughts on technical topics.

The magazine plays an instrumental role in providing exposure to the students to develop written communication skills and command over the language. It is a step towards building professional and ethical attitude in them. The entire journey of creating Digital Minds is an outcome of rigorous effort made by students and faculty. Students not only gain the knowledge about the latest technological developments and advancements through reading and writing articles but they also develop verbal and written communication skills.

This issue has expanded its scope by introducing articles by major stakeholders. Apart from students and faculty, inputs have been collected from alumni, parents and industry experts.

This has been an exciting year for the students, for the teaching staff, and more importantly for the Department of information Technology as a whole. We have undergone many changes to the way we operate and have re-evaluated all our activities and priorities.

It has been a year in which our overarching principle has been to renew our commitment of being a team led by and for its members, to seek the involvement of all, and to provide even more value to the entire college.

In practical terms, this means that we are taking definite steps to address the technical challenges that have evolved in recent years. Although the entire department contributed, and I was privileged to lead the effort, much credit should go to the Teachers members and Students.

In Information Technology you will study and apply your knowledge in understanding what computers are, as how to program them, tools to write a program, the rules when converting the written program understandable by the computers, the interface between the computer and the user, the computer graphics, computer networking, managing the software database, software engineering and testing them efficiently and more.

On concluding note, I would like to thank all the stakeholders for their involvement and encouragement and wish all the best for their bright future.

**Dr. Tushar Sambare**  
**Co-ordinator**  
**Department of Information Technology**

### ***Editor`s desk***

Information technology is a growing field. Information technology deals with the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications.

Nowadays, mobile phones are dethroning the personal computer and computing is evolving faster to become disembodied more like a **cloud**, becoming accessible more easily whenever needed.

We all love Internet and with amazing technological advancements, there is absolutely nothing impossible these days. Technology and of course Internet has become an integral part of our lives.

We appreciate the student`s contribution in the magazine “Digital Minds” in our previous volume.

This magazine comprising of many technological innovative concepts IT and Computer Science field. Technology is evolving rapidly. This magazine gives the platform for the research bent of mind for the students. It gives an immense push up for the students to research in various areas like AI, Robotics, Gaming, Virtual Reality etc.

**“The art challenges the technology, and the technology inspires the art.”**

**-John Lasseter**

**Asst. Prof. Sheetal Khanore**

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# Artificial Intelligence (AI)

**SHEIKH AYESHA AHMED**

**T.Y.BSc.IT (B)**



The field of Artificial Intelligence was started more than six decades ago, with the work of Alan Turing about computers and intelligence, in 1950, and a famous conference, in 1956, in Dartmouth College, where many well-known researchers met, including John McCarthy, Marvin Minsky, Allen Newell, Arthur Samuel, and Herbert Simon. Before these events, the idea that computers could display intelligent behavior had been only addressed in very vague, abstract, and philosophical terms. During the ensuing decades, Artificial Intelligence has seen several Springs of hope and Winters of discontent, as positive results alternated with negative ones. At times, artificially intelligent systems looked just around the corner, while at other times the whole enterprise seemed doomed by its sheer complexity.

Overall, however, Artificial Intelligence managed to build an important body of knowledge that, six decades hence, led to many practical applications. Among the technologies created by Artificial Intelligence researchers, machine learning, the set of algorithms that enable computers to learn from experience, is probably the most significant and well-known.

Today, advances in computing, coupled with imaging and instrumentation technologies, improved our knowledge of many biological systems, including the brain, to a point where it is possible to think of something that, until now, was just a dream: model and simulate, in a computer, the behavior of a complete brain. Such an effort is under development for the brain of the worm *Caenorhabditis elegans*, with its 302 neurons, first mapped by Sydney Brenner's team, in 1986, and for several other species. Large research projects, such as the Human Brain Project, in Europe, and the Human Connectome Project, in the US, aim at mapping, modeling, and simulating significant structures of the brains of mammals, primates, and even humans.



One of the many important questions that will need to be answered is whether this next revolution, called the fourth industrial revolution by many, will also create more jobs than it destroys, as has happened with the previous industrial revolutions. Many, including me, believe that this time it may be different, and that we may move towards a new phase in the economic structure of nations, with many citizens not being able to hold meaningful and rewarding jobs. Now is the time to discuss the steps that we, as a society, should take, to make sure our future, as a whole, is improved by these new and wondrous technologies, and not put in jeopardy but the appearance of Digital Minds. The digital minds aims to contribute to this discussion, and also to give some hints on what could be the future of humanity.

Examples of artificial intelligence (AI) in pop culture usually involve a pack of intelligent robots hell-bent on overthrowing the human race, or at least a fancy theme park. Sentient machines with general artificial intelligence don't yet exist, and they likely won't exist anytime soon, so we're safe... for now. That's not to make light of AI's potential impact on our future. In a recent survey, more than 72% of Americans expressed worry about a future in which machines perform many human jobs. Additionally, tech billionaire Elon Musk, long an advocate for the regulation of artificial intelligence, recently called AI more dangerous than nukes. Despite these legitimate concerns, we're a long way from living in West world.

One of the AI live examples is

#### NUMERAI: AN AI-POWERED, CROWDSOURCED HEDGE FUND

Industry: Hedge Fund, Artificial Intelligence, Blockchain

Location: San Francisco

How it's using AI: Numerai is an AI-powered hedge fund using crowdsourced machine learning from thousands of data scientists around the world. The company releases abstracted financial data to its community of data scientists, all of whom are using different machine learning models to predict the stock market. The models are pitted against one another in a weekly tournament where creators compete for Numeraire (NMR), the company's cryptocurrency. The most accurate predictions make it to the top of the leaderboard and are awarded more tokens. But Numerai isn't really about rewarding winners and losers. The competition is simply a way to collect more models. The company's real breakthrough is in how it synthesizes all of the varying approaches into a "Meta Model." The diversity of the models within the "Meta Model" creates diversity in the portfolio, reducing risk and generating higher returns. Simply put, the more algorithms at work, the better. Industry impact: The company's top secret about the makeup of the fund, its clients and performance, but has more than 35,000 data scientists contributing to its platform and has paid out some \$15 million worth of its cryptocurrency

**“The only constant in the technology industry is change.”**

**-Marc Benioff**



# Augmented Reality Vs Virtual Reality

**Vishal Fernando**

**T.Y.BSc.IT (A)**

“What is real and what is not” – this expression can’t be truer than today. And No, we are not discussing anything even adjacent to spirituality, but the expression simply tries to summarize my astonishment at the growing use of “Augmented Reality” and “Virtual Reality” these days, such that the boundary between the real world and the virtual world is gradually diffusing. To most of us, both the technologies sound very similar as they blend over into each other a bit. As such, there is a prevailing confusion that “Augmented Reality” and “Virtual Reality” are the same thing – but they are more like cousins and not twins.



One of the prime examples of Augmented Reality is Pokémon Go – where millions of people across the world can be seen running on the streets with their smartphones in the quest for tiny virtual creatures. Pokémon Go is an extension of this technology to smartphones where it uses your phone’s camera to sense your surroundings and place additional information on top of it

to build an enriching experience. Basically, the mobile app virtually places a Pokémon on your screen, on top of whatever the camera can capture in front of it.

Another example can be of Microsoft HoloLens which is an Augmented Reality device with various enterprise-level “smart glasses”. The glasses are transparent and let you see things in front of you as if you are wearing a weak pair of sunglasses. This technology is intended for providing completely free movement and lets you project images over whatever you look at. So, this device basically lets you place virtual floating app windows and 3D decorations around you. The Microsoft HoloLens uses advanced pattern recognition coupled with a stereoscopic camera that helps in tracking its surroundings all the time.

Some of the fields in which Augmented Reality finds applications are medical uses (Neuro-Surgery), navigation apps, sight-seeing in tourism, maintenance & repair of machinery, advertisements & promotions.

Virtual Reality headsets are an entirely different proposition compared to Augmented Reality as it completely obscures your vision of the surroundings and gives you the impression that you are in a different world. Some of the common virtual reality devices are HTC Vive and Oculus Rift. The Virtual Reality technology is capable of immersing the users into a completely different virtual world which is generated by using a computer interface. Some of the most advanced virtual reality devices even offer freedom of movement which means that as a user you can move in a digital environment and hear sounds.



However, once you switch it on, the LCD or OLED panels inside get activated and start refracting lights to completely fill your field of vision with the digitally built environment. The virtual reality technology is used for various applications that include the game, 360° video or it may be just a virtual space. Basically, you are virtually transported to a different surrounding such that the outside real-world environment is replaced with a virtual one.

Some of the fields in which virtual reality finds application is military in the UK and the US, sports industry, treatment of post-traumatic stress, practice surgeries and revolutionizing the education industry.

So, it can be concluded that despite having almost similar designs of the devices, Augmented Reality and Virtual Reality accomplish two very different things in two very different ways. While Augmented Reality devices are an extension to the real world by overlaying digital objects on the surrounding, Virtual Reality devices replace the real world and take you to somewhere else. Both technologies are very powerful, show a lot of promise and are in the process of making their mark with consumers. Although it can be predicted that in the future these technologies are going to change the way we use our computers, it is very difficult to say whether one or both of them will be there in the long run!

**“Science and technology revolutionize our lives, but memory, tradition and myth frame our response.”**

**- Arthur M. Schlesinger**





# Azure

**Omkar More**

**F.Y.BSc.IT (A)**

Azure is a public cloud service platform by Microsoft. Microsoft Azure was launched in 2010. MS Azure is flexible, economical, open to the public, fast and reliable. It provides different domains such as database, networking, virtual computing, computes, developer tools and other functional tools which helps an organization to grow to a large scale. Azure services are broadly categorized as the platform as a service(PaaS), Software as a service(SaaS) and Infrastructure as a service(IaaS). Azure is the only consistent hybrid cloud service which has more regions than any other cloud provider. Such cloud service is used to replace or supplement your on-premise servers.



Azure also acts as a backup and disaster recovery dream tool because of its flexibility, advanced site recovery and built-in integration. As a cloud-based solution, Azure is innately flexible, it can backup your data in any language, any OS and any from any location. You can have your own back-up schedule depending on the day, week, month, etc. IT professionals are looking for a platform for hosting, developing or managing a website or mobile app, Azure makes it possible with its Autoscale and integration for on-premises apps. AutoScale is a feature built into Azure Web Apps that adjusts your resources automatically based on customer web traffic, so you have the resources you need when traffic is high, and save money when you're not in peak times. Through Azure, you can seamlessly link your web app to an on-premise app. Connecting apps in both locations let both employees and

partners securely access resources inside your firewall—resources that would otherwise be difficult to access externally. If you have multiple locations or use on-premise apps or cloud apps like Office 365, Active Directory integration with Azure will be the central tool for managing and maintaining access to all of these tools. The scalability, flexibility, and security of Microsoft Azure makes it the perfect resource for companies moving toward IoT solutions. You can connect your devices to the cloud using solutions that integrate with your existing infrastructure and start collecting new data about your company. Within the Azure IoT Hub, you can monitor and manage billions of devices and gain insights to help you make better business decisions, improve customer experiences, reduce complexity, lower costs, and speed up development.



Cloud web services such as Microsoft Azure, AWS, etc are a replacement for software like Oracle Virtual Box, VMware, etc. in future. Azure services are cheap and can be accessed from anywhere and any-device across any platform. Azure services are charged as per hour(\$3.00), so I have to pay for the services depending on user's requirements and custom hardware can be used for the separate OS.

**“The great myth of our times is that technology is communication.”**

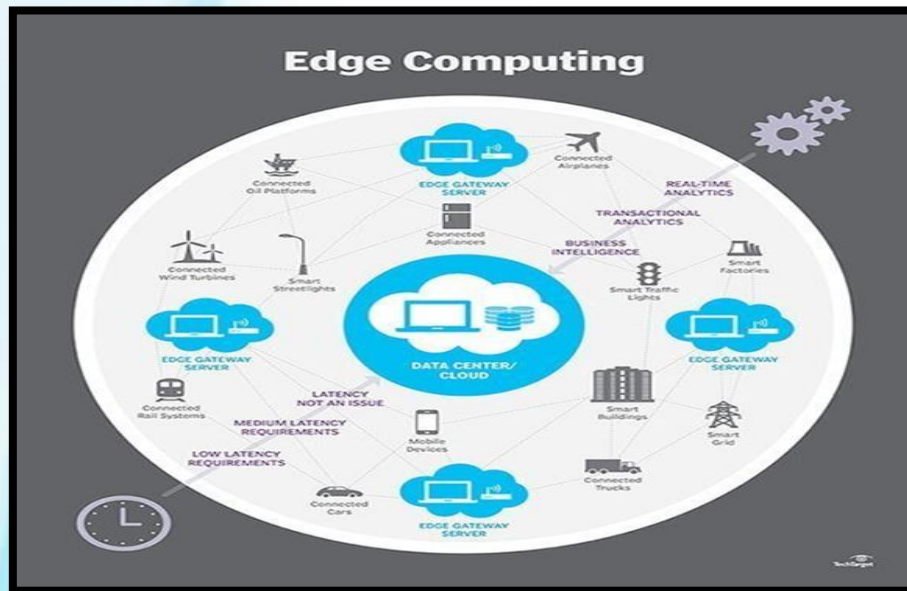
**- Libby Larsen**



# Edge Computing

Jeeshan Choudhary

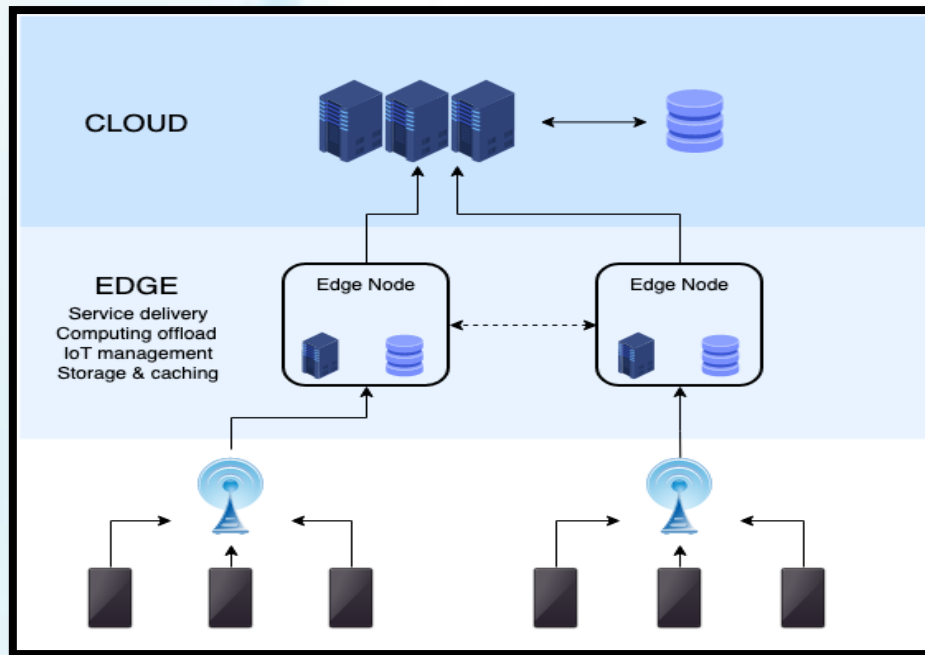
S.Y.BSc.IT (A)



Gartner characterizes edge computing as "a piece of an appropriated registering topology in which data preparing is found near the edge – where things and individuals deliver or expend that data."

At its essential level, edge computing brings calculation and information stockpiling nearer to the gadgets where it's being assembled, as opposed to depending on a focal area that can be a great many miles away. This is done with the goal that information, particularly ongoing information, doesn't endure dormancy gives that can influence an application's presentation. What's more, organizations can set aside cash by having the handling done locally, decreasing the measure of information that should be prepared in a brought together or cloud-based area.

Edge computing was created because of the exponential development of IoT gadgets, which interface with the web for either accepting data from the cloud or conveying information back to the cloud. Also, numerous IoT gadgets create colossal measures of information over the span of their tasks.



Consider gadgets that screen producing gear on a manufacturing plant floor, or a web associated camcorder that sends live film from a remote office. While a solitary gadget creating information can transmit it over a system effectively, issues emerge when the quantity of gadgets transmitting information simultaneously develops. Rather than one camcorder transmitting live film, increase that by hundreds or thousands of gadgets. Not exclusively will quality endure because of dormancy, however the expenses in transfer speed can be gigantic.

For some organizations, the cost reserve funds alone can be a driver towards sending an edge-computing design. Organizations that grasped the cloud for a considerable lot of their applications may have found that the expenses in data transfer capacity were higher than they anticipated.

Progressively, however, the greatest advantage of edge computing is the capacity to process and store information quicker, empowering for increasingly effective ongoing applications that are basic to organizations. Before edge computing, a cell phone examining an individual's face for facial acknowledgment would need to run the facial acknowledgment calculation through a cloud-based assistance, which would set aside a great deal of effort to process. With an edge registering model, the calculation could run locally on an edge server or entryway, or even on the cell phone itself, given the expanding intensity of cell phones. Applications, for example, virtual and expanded reality, self-driving vehicles, keen urban areas and in any event, building-computerization frameworks require quick preparing and reaction.

In any case, just like the case with numerous new advancements, taking care of one issue can make others. From a security point of view, information at the edge can be problematic, particularly when it's being dealt with by various gadgets that probably won't be as secure as a unified or cloud-based framework. As the quantity of IoT gadgets develop, it's basic that IT comprehends the potential security issues around these gadgets, and to ensure those frameworks can be made sure about. This incorporates ensuring that information is scrambled, and that the right access-control techniques and even VPN burrowing is used.



Moreover, contrasting gadget necessities for handling force, power and system network can affect the unwavering quality of an edge gadget. This makes repetition and failover the executives significant for gadgets that procedure information at the edge to guarantee that the information is conveyed and prepared accurately when a solitary hub goes down.

Around the globe, bearers are sending 5G remote advancements, which guarantee the advantages of high transfer speed and low dormancy for applications, empowering organizations to go from a nursery hose to a firehose with their information data transmission. Rather than simply offering the quicker speeds and advising organizations to keep handling information in the cloud, numerous transporters are working edge-figuring procedures into their 5G arrangements so as to offer quicker continuous preparing, particularly for cell phones, associated autos and self-driving vehicles.

In its ongoing report "5G, IoT and Edge Compute Trends," Futurism composes that 5G will be an impetus for edge-compute innovation. "Applications utilizing 5G innovation will change traffic request designs, giving the greatest driver to edge computing in portable cell arranges," the firm composes. It refers to low-inactivity applications that incorporate IoT investigation, AI, computer generated reality, self-sufficient vehicles as those that "have new transmission capacity and dormancy qualities that will require support from edge-process foundation."

**“Technology is the campfire around which we tell our stories.”**

**- Laurie Anderson**

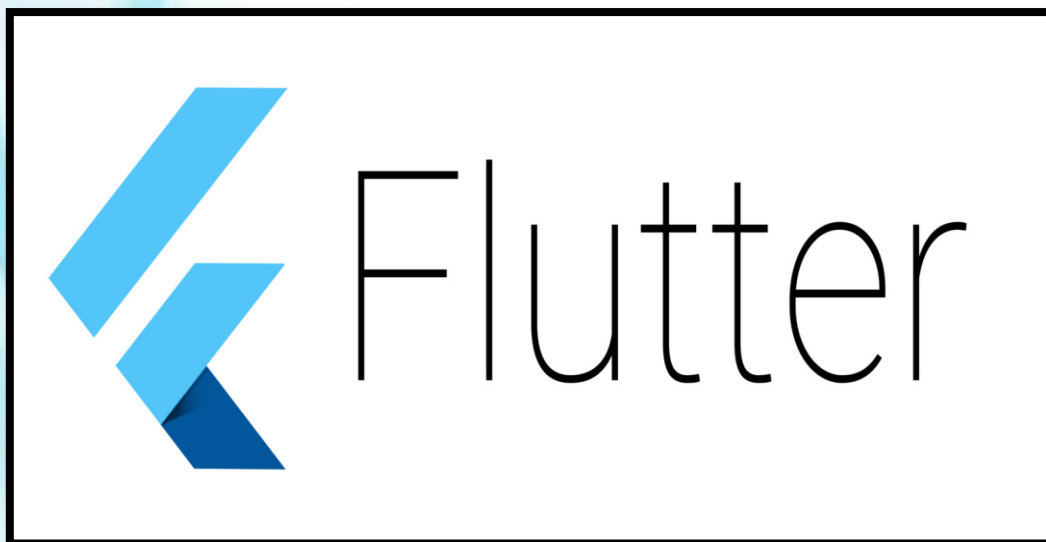


# Flutter

**Rohit Thukral**

**S.Y.BSc.IT (B)**

As an application developer, we have to learn languages like Java/Kotlin and Objective-C/Swift so that we can natively create applications for Android and iOS respectively. However, in this fast-paced field of application development, an average aspiring developer simply cannot afford to pour all their time into learning two languages to keep up with today's times. This is a big issue faced by most of the aspiring developers all around the world. If you, the reader are facing this issue then I have a solution just for you: Flutter.



Flutter is an open source UI framework in which developers can create native mobile apps for Android and iOS. Using Flutter, one can create beautifully designed applications with smooth animations while not having to compromise on the performance of the app itself. The best part about using Flutter is that the developer only needs to code once and can deploy the app for Android, iOS or both! Flutter uses a programming language called dart which is very easy to pick up if you have some experience in other programming languages. For someone who is also looking to create software for Windows, Mac OSX, Linux as well as web apps can also use Flutter to develop software.

The uses of Flutter are 1)By having dart as your only programming language to learn, not only are you saving years of effort to perfect the two different languages but you can get developing the app of your dreams much sooner. 2) By using the revolutionary hot reload feature, we can cut down the compile time which is really useful to debug your application quickly and making the overall development cycle much efficient. 3) Flutter uses a widget system which gives you complete control over every pixel on the screen. Building a custom design has never been easier! 4) In spite of just having just one source code, Flutter apps still give that seamless native

experience the users expect. 5) Flutter is a Software Development Kit (SDK) backed up by the Tech Giant Google themselves so we can always expect regular updates which will further improve performance and efficiency of using it. Besides these advantages, imagine the,



Use of Flutter in the corporate world are 1) If you learn flutter and apply for jobs, you are more than likely to get hired as you will be able to create native apps for Android and iOS much quicker and it will be cost efficient for the hirer to hire you. 2) As a business owner who is creating an application, you will be able to quickly deploy the app of your dreams for the world to use and enjoy. 3) As a freelancer, not only will it make your development cycle simpler, you will be able to produce results for your clients at a much faster rate and are providing much more value at the same time, which will build a deeper trust between you and them. After years of having to do app development the hard way, it is time to use Flutter to create apps in a smart way.

**“We are stuck with technology when what we really want is just stuff that works”.**

**– Douglas Adams**



# Intelligent Apps

**Jeeshan Choudhary**

**SY BSc I.T(A)**

Intelligent Apps are the application which gets constant and authentic information from client connections and different sources so as to give proposals and make expectations. It offers customized and versatile client encounters; information investigation and AI are the centre parts of smart applications. After secure, the clients' needs, these applications convey logical and pertinent data just as assess the clients about up and coming issues before they emerge. With the help of a high level of prescient investigation, intelligent applications foreshadow the clients' conduct to make data accessible without any problem.

Artificial Intelligence is utilized in building up an astute application that is greatly modern by having calculations; it computerizes how much errands to be performed. There are a few B2C organizations would embrace and execute keen applications by having expanding energetic willingness, yet its versatility and development are normal in B2B situations.



Highlights incorporate are IA take a shot at a huge measure of information; it can peruse and store an immense range of human interactions. It joins forms with tangible data sources and fuelled by IOT which may come up with important bits of knowledge. Another fascination for which huge partnerships and new businesses go for intelligent applications is versatility. It gives more significant yields on speculation. Subsequently, the feeling of smoothly intrinsic the conduct which permits applications to adjust things to new requests, inferable from its supported learning way. A really intelligent application can deliver results just by understanding motions, movements and speech inputs. It likewise permits clients to get rid of the need to utilize the business key.

Those days have gone when workers were delighted with basic portable empowered access to key business applications and information. The present computerized locals request



substantially more than this, they foresee clever client experience and exceptionally useable as offered by buyer applications. Furthermore, insightful applications guarantee to give the equivalent. Also, IA helps representatives to achieve their work in an alternate way, for example, By offering exceptionally customized and setting delicate data, insightful applications empower laborers' to rapidly channel and streamline profoundly appropriate data based on their requirements. It encourages the dynamic procedure. For the versatile workforce, intelligent applications can give the perfect data to do their present place of employment in a powerful way. It automates complex issues by means of preparing them into regular language, IA adds to upgrading yield, help up reaction time.

In future close by, enterprises will keep on utilizing their legacy devices or frameworks to discover to use IA to broaden their business activities or procedures. For example — basic applications for example messages couldn't leave totally; right now, can create intelligent applications with the component to alarm representatives about messages who encourages fast activities. The general goal of intelligent applications is to work in congruity with surviving instruments and render more focused on and customized data; it drives representatives' will have the option to expand quality and yield in their activity.

Since past decades, administrators are focusing to sanction their computerized data activities and for this reason, they have to add intelligent applications to their outline. The rise of new IA guarantees new development zones, continuous securing, inward and outer information sources, putting the best innovation to utilize, handling and examination.

All things considered, it may sound insane, however the intelligent applications can and do communicate for our sake. These applications use huge amounts of calculations to anticipate whom we need to speak with and dependent on your previous reactions and responses, these applications are competent to distinguish what you may answer or impart to a specific message that has been gotten. These reactions are too genuine that the one the smart applications are speaking with won't understand that s/he is conversing with an application and not you.

**“If people resist Root Cause Analysis, ask what they will do to prevent it in the future.”**

**-Denis Matte**



# IOS Jailbreaking

**Munira Tashrifwala**

**T.Y.BSc.IT (B)**



Apple is able to provide a very stable experience to its users in its products as it develops both the hardware and software of the devices it releases. Especially when compared to Android devices in its segment, it seems as if it is behind in terms of hardware, but it has no lagging in terms of performance.

However, iPhone users want to eliminate some of the limits and barriers that Apple has set, despite all the stabilization. There is also a process that users do to overcome these barriers: jailbreak. This process debuted with the first iPhone released in 2007, and went on with every new device and every new iOS version. Now a new jailbreak has been released for the new iOS version

Jailbreak refers to the process of gaining root access to the iOS operating system that runs on Apple devices, including the iPad, iPhone and iPod Touch. Jailbreaking frees the device from dependence on Apple as the exclusive source of applications, allowing users to install third-party apps unavailable at the official App Store. Users can also customize their home screens and modify the appearance of icons and menus. Jailbreaking is sometimes a prelude to unlocking an iPhone or modifying its baseband so that the unit can work with other mobile networks. Jailbreak may also be known as jailbreaking or iOS jailbreak.

When dealing with something like a jailbreak, there is always a small chance something could go wrong with your phone, and we cannot be responsible for this. But, jailbreaking is extremely easy and you should be perfectly fine.

To jailbreak your iPhone means you are freeing it from the limitations imposed by Apple. Freeing a device means that it can install applications from outside Apple's iTunes App Store and you can fiddle with previously restricted aspects of an iOS device. Jailbreaking can also help you unlock your iPhone to make it available on other carriers. However, it's also worth noting that Apple warns against jailbreaking your iPhone or any other iOS device.

Many different types of jailbreaks have come out over the years. An untethered jailbreak is a jailbreak that does not require any assistance when it reboots up. The kernel will be patched without the help of a computer or an application. These jailbreaks are uncommon and take a significant amount of reverse engineering to create. A tethered jailbreak is the opposite of an untethered jailbreak, in the sense that a computer is required to boot, and the device will not boot by itself. While using a tethered jailbreak, the user will still be able to restart/kill the springboard without needing to reboot. A mix between an untethered and a tethered jailbreak is also an option, namely semi-tethered. This type of jailbreak allows the user to reboot, but there will not be a patched kernel. Semi-untethered variant, this type of jailbreak is like a semi-tethered jailbreak in which when the device reboots, it no longer has a patched kernel, but the kernel can be patched without using a computer. The kernel is usually patched using an application installed on the device. Most recent jailbreaks have been the semi-untethered variant.

**“When working for IT Security, you are only one Incident away from being the most important group in IT.”**

**-Unknown**



# Replacing Internet Router With A Light Bulb

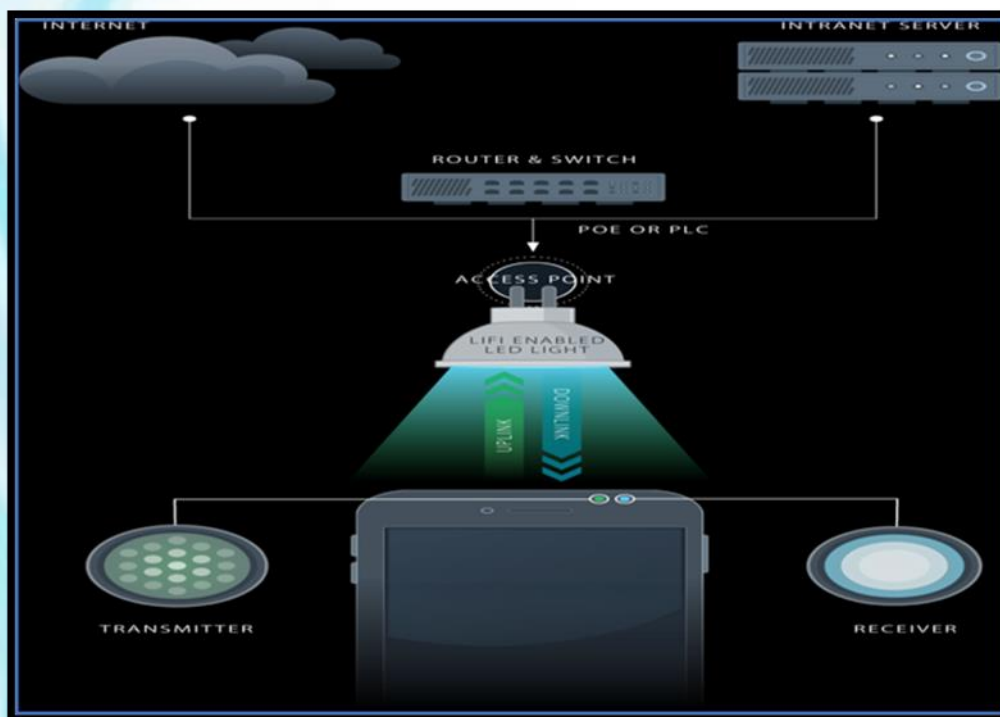
Ian D'Souza

S.Y.BSc.IT (B)

Are you fed up of the same old awful internet speed you have to face daily? Are you tired of trying to get a good signal on your Wi-Fi while sleeping in awkward positions? Well, all your prayers have been answered.

Li-Fi: An internet connection with the help of light. This entire concept and invention was started by a company called pureLifi. Li-Fi is a mobile wireless technology that uses light rather than radio frequencies to transmit data. The WiFi that you use at home or anywhere else transmits data in the form of radio waves. Here, light rays are used and as we all know, light is the fastest thing known to man. Thus, the data transmitted through Li-Fi is much much faster than what we get in our normal WiFi.

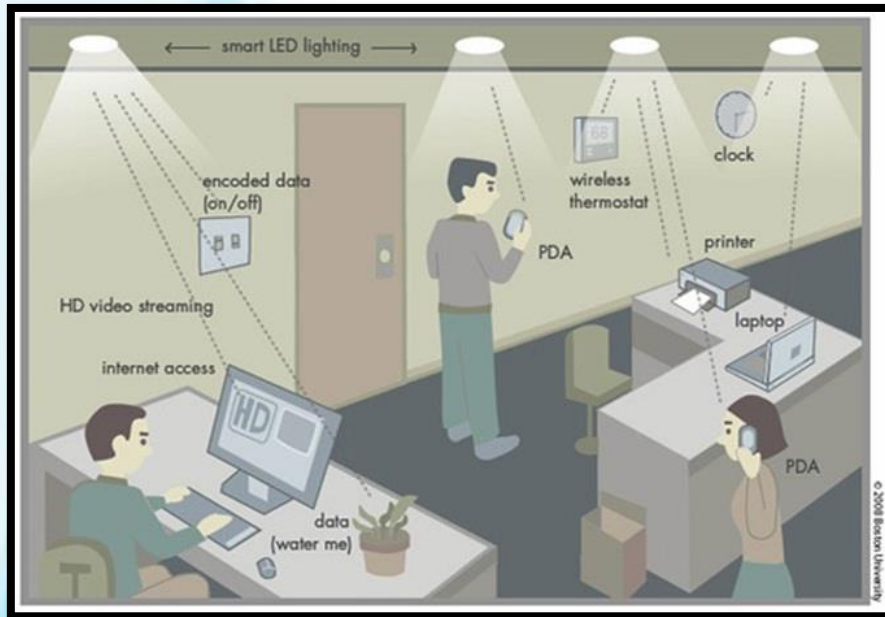
The working of it but this diagram should sum up a lot of the details.



Some key features of Li-Fi are Security: You don't have to worry about your neighbour who you gave your WiFi password some time ago. Just pull up your curtains, restrict the light going outside and there you have it. Your own personal internet space. Speed: Speed is one of the key factors of using Li-Fi. It can transmit gigabytes of speed in devices using it. Also, it has latency three times lesser than that of WiFi. Interference-Free: Radio waves are often hindered by a lot of other signals like cordless phones, microwaves or even neighbouring WiFi networks. Here, this problem is pretty minor if not negligible at all.



Minimal Components: LiFi uses just LED bulbs and a device that can actually function with LiFi. With the rise of 5G, a lot of devices are becoming compatible with this concept.



There are a ton of other features which come with LiFi like reliability, localisation, etc. which I won't be mentioning in detail. Many major companies, schools, hospitals, military camps and many other locations have already started their daily functioning in parallel to using LiFi and why wouldn't they. The only considerable downside to LiFi is the short range it provides. Although this problem can be easily tackled using multiple sources, it is something to work on.

LiFi may not yet be able to replace WiFi completely. It can surely be an amazing companion for WiFi currently but soon enough, it will replace it. So when your device starts supporting this technology, get your set up ready as fast as you can. Download 10 movies in an hour, stream on 10 devices at the same time or use multiple VPNs on your phone without hesitating even a little bit. LiFi is surely a thing of the future and trust me when I tell you, it's looking BRIGHT.

**“Technology has to be invented or adopted.”**

**- Jared Diamond**



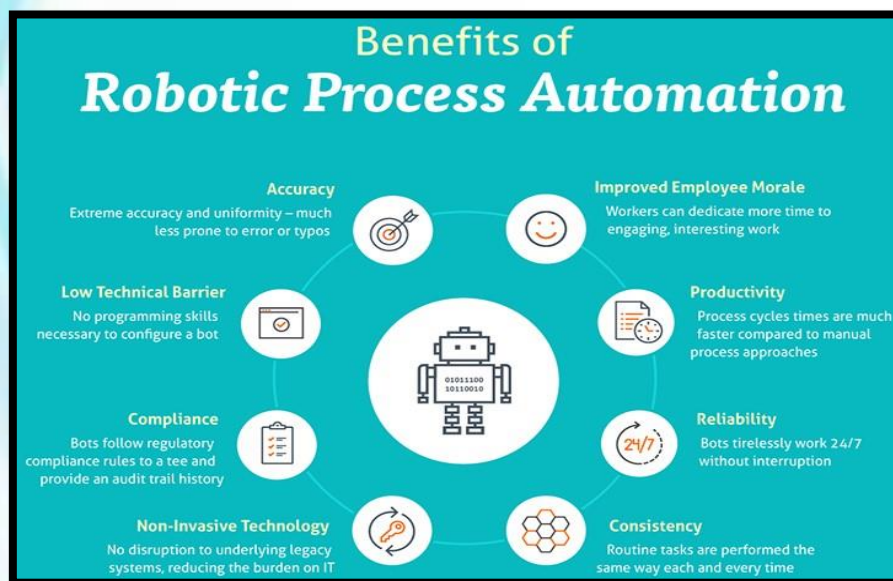
# Robotic Process Automation

**Jeet Thakkar**

**SY.BSc.IT (A)**

Robotic Process Automation AKA (RPA) is the most popular and required in all the major industries. The 'Robot' in RPA does not mean Physical Robot. They are software-based robots famously known as 'Bots'. These Robots are designed for automating specific task which makes the manual work very less and also makes less human intervention or No human intervention at all it depends if the bot is Attended Bot: - Need little bit of human intervention wherever required. Unattended Bot: - No need of Human intervention at all the task is done from starting to end by itself. Meta Bot: - Meta Bot is just a readymade Bot used for common specific tasks where the user needs to just insert the input. Ex: - Excel reading and editing Bots or Mail reading Bots.

These Bots are made to handle Tedious tasks and make a time-consuming task easy. RPA can be seen vastly in BPO, Banking Sector, Factories, Billing process.



RPA is a common Process Name RPA can be made using different Software and Coding Language.

Famous Software for RPA creation is Automation Anywhere, UI path, Blue Prism, Ant Works And can also be made using Python Programming language and its different Libraries

RPA Market Size Worth \$10.7 Billion By 2027. The global robotic process automation market size is expected to reach USD 10.7 billion by 2027, expanding at a CAGR of 33.6% from 2020 to 2027.

RPA is a good opportunity for a career boost There are different type of role in RPA

Such as Business Analyst (BA): - BA task is to select out if the Process should be automated. Starting salary is ₹10,00,000 or more depending on the experience and knowledge. They are the process Designer. Bots Developer: - They see the manual process learn every of its exception and the flow and develop the bot to automate the task smoothly with exception handling. Starting salary is ₹6,00,000 or more depending on the experience and knowledge.

When the RPA combines with Artificial Intelligence it is known as Intelligent Process Automation AKA(IPA) It has AI and ML capabilities like OCR (optical character Recognition) engine, NLU, NLP and many more services which can be connected. Services like AWS, IBM Watson, Azure and many more.

IPA has been a great deal for everyone as they learn and evolve and can make decisions by themselves. And more companies are looking forward to implementing such technologies rather than hiring humans for the job as it is more cost saving.

**“IT is not just another department in an organization. It’s pervasive, like electricity.”**

**-The Phoenix Project**



# Bug Bounty Hunting

**Akash Pati**

**T.Y.BSc.IT (B)**

Over the past decade or so, the cybersecurity landscape has changed drastically and this has created a significant requirement for cybersecurity professionals along with new job roles. Though there are a huge number of cybersecurity job roles available today, there is one role that isn't much talked about- bug bounty hunter.

A bug bounty hunter is an individual who knows the nuts and bolts of cybersecurity and is well familiar with finding bugs or flaws. Simply put, a bug bounty hunter tests applications and platforms and looks for bugs that sometimes even the in-house development team fails to spot. Once spotting a bug, these professionals inform the company (or the concerned body behind the application or the platform) about the bug and in return, they get paid. The benefits are not always monetary.



The concept of a bug bounty is not really new — however, in India, it has gained traction over the last decade. A bug bounty hunter is bound to work for one single client or company; s/he can work for other companies as well, as all they have to do, is to discover bugs and report.

But why don't companies set up an in-house dedicated bug-hunting team? The reason behind this is the fact when there is a huge number of hackers (white hats) are trying to find a bug, the chances are much higher than the problem would be sorted quickly and more easily.

And if you look at it practically, the companies don't have to pay on a monthly basis to the in-house team, rather they can pay people who would help them uncover all the flaws and award them with benefits.



Before jumping right into covering how you can get started as a bug bounty hunter, having a cybersecurity background or a significant knowledge of vulnerability assessment will be helpful. However, it is not mandatory to be well-versed in cybersecurity — there are many high-earning bug bounty hunters who are self-taught.



Irrespective of the domain, this is the first and foremost thing one should do before jumping right into the getting started. Try to look for the trends in the bug bounty industry — what kind of platforms are involved, what are the methods that the hackers are using, tools involved etc. This would give an idea about how you should move ahead to get started as a bug bounty hunter.

Some of the key areas to focus are cross-site scripting (XSS), SQL Injection, Business Logic, Information Gathering etc.

Cybersecurity is a vast topic, and one cannot master it just in a few days. When it comes to learning the nuts and bolts of vulnerability assessment, people either go for a short time approach or they either take a full-fledged training. However, it completely depends on you and how you want fast you want to learn.

Here we will look at the short time approach that you can take to kick start your bug bounty journey and let's focus on the web and mobile platform. In order to learn, you can always prefer some of the sought after books from the domain: 1) The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws 2) Web Hacking 101: How to Make Money Hacking Ethically 3) OWASP Testing Guide v4.

If you want to take things further, you can always join full-time cybersecurity training such as CEH. And just because you are taking a full-time course that doesn't mean you are not supposed to go for the practical approach. When you start to gain the knowledge you start directly with some bug bounty programs on the internet.

One more method to learn the game is by reading POCs by other hackers or by watching tutorials on YouTube. It is also considered to be one of the best ways to expand your knowledge.

This is one of the most crucial things when it comes to practice vulnerability assessment or penetration testing. While training institutes provide you with the practice platform, it is tough for self-taught professionals. One cannot simply hack random websites or platforms on the internet as it is not legal.

So, it is always advised to set up a virtual system and try out your skills. Or one can even try practising on bug bounty programs itself. You have a look at all the previous years bug that were discovered, and the methods used.

When it comes to penetration testing or vulnerability assessment, Kali Linux is definitely one of the best. However, it is not mandatory. The only reason behind using Kali Linux is the fact that the OS is loaded with hundreds of tools that are sophisticated and are capable of breaking into some of the strong cybersecurity infrastructures.

**“Any sufficiently advanced bug is indistinguishable from a feature.”**

**–Rick Kulaweic**



# OLA

**Bipin Rajbhar**

**T.Y.BSc.IT (B)**



India's Ola is further widening its lead over Uber in the nation — and getting the help it needs from their mutual investor. Ola Electric has raised \$250 million from SoftBank as India's largest ride-hailing firm pushes to scale its electric vehicles business in the country.

The Series B financing round, details of which emerged in a filing to the local regulator on Tuesday, valued Ola Electric at \$1 billion, a source familiar with the matter said.

The infusion comes as New Delhi looks to take a serious step in electrifying the existing fleet of cabs and scooters in the country as it attempts to curtail air pollution and carbon emissions. The country has set an ambitious goal to convert 40% of the fleet to electric by 2026.

Just so it happens, Ola has been working on electric vehicles for several years. The company is currently running several two-wheeler and three-wheeler electric vehicles pilot programs across the nation. It is also building charging infrastructure and swappable battery systems for these vehicles.



Ola Electric, which raised \$56 million earlier this year, plans to bring 10,000 e-vehicles to the road by the end of this year and deploy a million similar vehicles over the coming years. The parent group, which raised \$300 million from Hyundai and Kia to expand its mobility solutions and electric vehicles programs as part of an ongoing Series J round earlier this year, also is partnering with original equipment manufacturers to scale the EV business.

The active participation of SoftBank in Ola quells speculations that the Indian firm was trying to distance itself from the conglomerate fund. Ola Electric has become the first EV business in India to gain unicorn status. A company spokesperson declined to comment.

The firm, which already has presence in the U.K., New Zealand and Australia, last month announced that it will set up shop in Uber's backyard. Ola said it will build a new advanced technology center in San Francisco and employ more than 150 engineers there.

"As we think of the next decade, we want to invest in and we want to be very relevant on the global scale business front as well as building new-age, cutting-edge technology which impact the new-age business model of the future, there is no better place in the world to do it than here in the Bay area, we have made a small start, we will be hiring close to around 100-150 people here this year and from there we will take it beyond," Ola co-founder and CEO Bhavish Aggarwal said at a recent conference.

Uber, meanwhile, currently has little to no electric vehicles in the nation. Just two months ago, it partnered with electric bicycle sharing platform Yulu to conduct a trial in Bangalore. Globally, however, Uber ATG spun out of the San Francisco-headquartered firm and raised capital for its self-driving business. China's Didi is reportedly eyeing going the same route.

**"The best customer service is when end users don't need to reach out to the help desk."**

**-Nishant Rao**





# Frozen 2

**Ritesh Singh**

**F.Y.I.T.B**

“Frozen II”, Sequel of “Frozen” the highest grossing animated movie of all time in 2013. This movie released on November 22th, 2019 and broke all the records and became the highest grossing animated movie of all time. The production begun in 2013 itself, so it took six years to create this movie. “Frozen II” is a really good example of advancement in technology over the years in the film industry. It took a team of 74 animator with some old and a lot of new software to create this magnificent movie.

The main characters, Elsa, Anna, Kristoff, and Olaf, were created from scratch for the first film, but now they needed a makeover. We can see the subtle differences in their faces, but even more so in their hair and clothes.



Disney Animation had a few movies in between "Frozen" and "Frozen II" to develop their animation. Anna's hair was based on programs used to make the hair in "Moana." For "Moana," they developed a software called Quicksilver, which allowed them to create realistic hair that could react to forces like wind, water, and intense action. As Anna had a lot of individual hair, they made a new software called Beast, that allowed them to simulate more and more hairs per frame, and at a much faster rate. The clothing designs in general are much more intricate than they were in the original. Anna and Elsa are standing in the Enchanted Forest, that their clothes are much more detailed. Meanwhile, even one can see all the little stitching on Anna's cape. Movement was also an essential trait to get right. Getting an animated character to move is all about mastering control points. Every finger has three or four control points alone. In "Frozen II," Elsa's feet had multiple control points so she would look natural while moving barefoot, which was important, given that her most important actions happen while barefoot.

But there are some new characters here that posed an even bigger challenge for the animators, and that's because they aren't human or creature, but the elements. Now, on most computer-

animated movies, the visual effects and animation teams work separately. The animators create the characters, and the visual effects team adds computer simulations. The issues faced by them where that those visual effect have become an actual character.

Gale: A gust of wind. Wind would usually be a visual effects simulation but here it's a character, so they had to create a new program for the animators just for this, called Swoop. To get this basically invisible character right, a wind rig ran alongside given scenes, and they were able to manipulate its size and add simulations to this that helped determine Gale's speed and path. The elements came in all shapes and sizes. The biggest ones were the Earth Giants. Because of their large size, the Earth Giants had to move very slowly. Making a giant made out of rocks move isn't easy. The rigging process was intense, as their rocky forms and asymmetrical bodies restricted their movements. It was also important that each piece of rock moved correctly and didn't go through another rock.



The Nokk, the water horse, which was the product of eight months of hard work. There were several challenges to creating a creature made out of water that also needed to be true to the look of an actual horse. they had to figure out how to control the water it's made of. The Nokk also had to look like it was part of the ocean, so they looked at elements of the actual ocean, like mist and spray, which forms at the end of the mane and tale as it moves.

While all the characters went through transformations, a lot changed in their world as well. In "Frozen," much of the land is covered in snow but in "Frozen II," it's supposed to be autumn, so the snow is melted. Since more of the ground and surroundings were revealed, there were a lot more details that needed to be included in each shot.

The Enchanted Forest where every tree, rock, and plant required a lot of planning and work to get where it is. While The dark sea is one of the big turning points in "Frozen II" happens in the Dark Sea. This is where the Nokk scene takes place. Animating realistic water is not easy, and animators used what they'd learned on previous Disney films to make it work. This scene required a lot of coordination between the animation team and the visual effects team, and since she was going to be walking on the simulation, it all had to match up perfectly. The animators also mastered some factors about water like how sand looks when it gets wet after getting hit by a wave.



Disney Animation developed another simulation engine for "Moana" called Splash, which gave them a lot of practice making the open seas. Through this they could calculate, for example, what it would look like for a wave to break. For "Moana," the challenge was trying to make the water calm, but for "Frozen II," it was important to make the waves big and overpowering while still seeming real. One can see those realistic waves, as Elsa stares them down on the beach before running in head-on.

This is how Frozen II was created over a period of six years and all their hard work in preparing the animations and software pay off as the movie broke all the past records and set a new record of earning 1.4 billion dollars worldwide.



# The Lion King

**Ruchika Gaimar**

## **F.Y.IT.B**

Staying true to the original film and creating a hyper realistically animated lion king for the new audience was a particularly tough challenge and it required millions of hours of animating. The first step in animation took place in pre virtualization here amplified animated sequences were created that could be used for virtual reality. The VR approach on set was unique the directors and other members would put on VR headset which would allow them to actually step in the virtual step they created. The animation team would create new systems for the lion king especially for the gust of wind passing through the manes of the lion or hair of any other animals.



The Asset Management System helped them to work on the mane of all the animals. Tessa (‘asset’ backwards!) gives productions a pipeline that can track, automate, and organize movement of digital assets between artists. The artist is insulated from the complexity of the underlying data and processes – allowing them to focus on their creative tasks rather than worrying about where something is. The software helped them in Tracks, automates and organizes, supported in multi-site pipelines, defining relationships between assets, Automates the creation of assets, Front-end python and c++ api and Multiple back-end microservices

They also created the Photorealistic Organic Fibres using a new software called Fertility. Fertility is MPC’s technology for creating photorealistic hair, fur, feathers, vegetation, and other fibres like clothing ropes. The Fertility engine itself is solely built on proprietary or open source technologies and then exposed via interfaces for the main 3D packages we are using: Maya and RenderMan. They also have the ability to render high quality previews using our in-house OpenGL renderer: MugginsGL.

Growing the fur was an important task which was accomplished by using Fertility tool. Fertility is a procedural tool, sampling the character’s mesh and growing fur at each sample on-demand. This is done by applying a sequence of GOPs (Geometry Operators) to curve geometry spawned at each sample location.





ION is a tool to build MPC's production and operational environments. The software is not run solely on an artist's workstation, but across the render farm; within our micro-services framework; in the cloud; on set or maybe in the middle of a field. It Manage dependencies and requirements and Backbone of MPC's pipeline. Amanda is a micro services framework that forms the backbone of MPC's pipeline. Hosting services for asset management, storage, data transfer, render, cloud, production and web tools.

The Review Tool and editing were used for VFX. With Review Tool we propose a novel way of managing visual effects editing that is inspired by music software and is built on top of a strong database back-end that automates most of the changes like Rich, collaborative workflow, Simple, intuitive visualization and Better screening room decisions.



# Artificial Intelligence and Neuroscience

**Nikhil Rane**

**T.Y.BSc.IT (B)**

Though deep learning is the main pillar of current AI techniques and is ubiquitous in basic science and real-world applications, it is also flagged by AI researchers for its black-box problem: it is easy to fool, and it also cannot explain how it makes a prediction or decision. Therefore, the significance of creating transparent, explainable AI, should not be underestimated. In particular, we are interested in leveraging insights from neurobiology that might be useful for novel approaches in AI, and techniques for analysing artificial neural networks that might be applied in turns to neuroscience.



As Artificial Intelligence (AI) becomes more pervasive, its failures will become more salient. This is not a paradox. In both the case of biological brains and AI, intelligence involves decision-making using data that are noisy and often ambiguously labelled. Input data can also be incorrect due to faulty sensors. Moreover, during the skill acquisition process, failure is required to learn.

When human intelligence fails with significant consequence, we look for root causes. When AI fails, we increasingly will require an explanation for what went wrong. Already European Union law requires the explanation of an AI decision that produces adverse consequences for its citizens. It is not just a matter of finding answers. The actual consequence is to determine responsibility both in the legal and economic respects. It is unlikely that AI can be free to be broadly applied in real contexts if responsibility assignment is not clearly defined. As with biological intelligence, an explanation for how an AI decision came to fruition is challenging.

In all cases, biological and AI, decision-making is distributed across a large number of nodes (or neurons) that each contributes to the final product to some varying degree.

The Potential applications of XAI in computational psychiatry are Real time, closed-loop stimulation for DBS: ML algorithms could be trained to identify electrophysiological patterns that correspond to pathological states and apply patterned DBS to achieve a normative state. It also helps in Development of inexpensive computerized assessments for diagnosing or characterizing prodromal risk for neuropsychiatric conditions such as psychosis, depression, PTSD, ADHD or autisms, Personalized medicine approach: XAI could provide automated identification of sub-clusters of patients through analysis of multimodal data (e.g., imaging, behavioural) to enable individualized interventions and forecasting and Identifying clinical diagnostic groups; discovering individualized biomarkers for treatment selection; tracking and quantifying treatment response over time.

Requirements to apply XAI approaches to neural circuit modulation are Analytic modelling of behaviour to define precision targets for ML, Statistically robust brain metrics to dimensionally differentiate along the normative-to-aberrant continuum of activity. It also requires Methods for discovering potential causal relationships between neurons and between neural activity and behaviour using large data sets and The inclusion of both central and peripheral nervous system dynamics (e.g., Vagal nerve stimulation or closed loop control of visceral organ systems). Linking of analytical models: For example, classification/brain-decoding models (SVM/MVPA) to theoretically-driven, encoding models or biological multi scale modelling. Technology required to determine the level of resolution (e.g., number of neurons) associated with a specific behaviour. Technology required to monitor population of cells across several brain regions chronically and simultaneously, while decoding the relevant biomarkers and delivering a modifying signal in real time.

Neuroscientists have developed new techniques to examine brain networks, which could be applied to artificial neural networks. Among these are the ability to label neurons actively involved in a particular memory (a cell assembly) and then to use molecular biology to mechanistically control those particular neurons in order to affect the specific memory. Since it is often easier to instrument and record from AI nodes than biological neurons, such an approach might be fruitful in AI. A number of AI researchers are analysing the layers of neural networks to compare the artificial receptive fields with biological receptive fields. In this way AI may have explanatory power for neurobiology.

**“IT is ever-changing and there is the need to evolve in order to stay relevant.”**

**-Ryan Ogilvie**



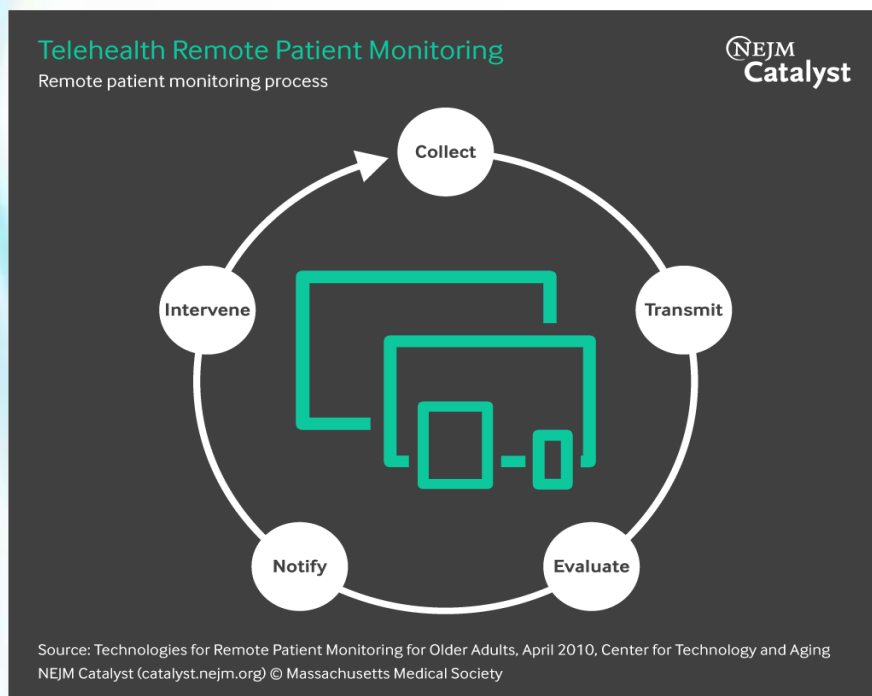
# Telehealth

**Siddhi Shete**

**F.Y.IT.B**

Telehealth is defined as the delivery and facilitation of health and health-related services including medical care, provider and patient education, health information services, and self-care via telecommunications and digital communication technologies. Live video conferencing, mobile health apps, “store and forward” electronic transmission, and remote patient monitoring (RPM) are examples of technologies used in telehealth. Several technologies are being deployed for telehealth including mHealth (or mobile health), video and audio technologies, digital photography, remote patient monitoring (RPM), and store and forward technologies.

mHealth or mobile health refers to healthcare applications and programs patients use on their smartphones, tablets, or laptops. These applications allow patients to track health measurements, set medication and appointment reminders, and share information with clinicians. Users can access hundreds of mHealth applications including asthma and diabetes management tools as well as weight loss or smoking cessation apps.



Remote Patient Monitoring involves the reporting, collection, transmission, and evaluation of patient health data through electronic devices such as wearables, mobile devices, smartphone apps, and internet-enabled computers. RPM technologies remind patients to weigh themselves and transmit the measurements to their physicians. Wearables and other electronic monitoring devices are being used to collect and transfer vital sign data including blood pressures, cardiac stats, oxygen levels, and respiratory rates.



With telehealth technologies, patients are taking more control of their well-being. Educational videos, health management apps for mobile devices, and online health learning and support communities empower patients to manage chronic conditions, lose weight, increase physical activity levels, and gain emotional support. They are accessing health education content via smartphones and computers to add to their self-care toolboxes. They are also using wearables and monitoring systems to gain knowledge about their sleep patterns, vital signs, and activity levels. Important lessons for telehealth integration can be learned from the implementation of electronic health records (EHRs), particularly the importance of usability design and clinician training to enhance productivity, quality, and safety. User-centered design that facilitates the integration of telehealth into workflows and clinical routines is essential, especially with respect to remote physical examination. Ease of use is equally important for consumers of telehealth interventions. Wireless monitoring, mobile health applications, social media, and smartphone video capabilities, among others, offer innovative possibilities to extend care relationships well beyond the traditional in-patient visit. The relationship between patients and physicians will inevitably be affected by patients' use of these new sources of clinical information and guidance, as they engage in their own health management. These tools will produce a large amount of new data and information and will change provider workflow, work culture, and interpersonal boundaries, resulting in new challenges to evolving patient–physician relationships.

Examples of telemedical services in healthcare - independently where the physician, the patient, the medical record or the medical technology is located – are:

Telemedicine: Transmission of medical images between healthcare centers for diagnosis across distance

Home-monitoring: Care services at the home of the patient (e. g. for elderly patients, diabetics) “care at home”

Tele-consultation: Provision of knowledge or experience of an expert across distance (e. g. teleradiology)

Diagnosis at distance: Diagnosis of a patient by a physician at distance(e. g. telecardiology)

Telemonitoring: Supervision of a patient and his data at distance, who is not in the hospital and/or clinic (e. g. diabetes patients, patients with heart insufficiencies)

Tele-learning: Education and training of patients and/or professionals at distance

**“Frictionless IT catalyses information flow, cultivates cross-functional communication, and accelerates business mobility.”**

— Pearl Zhu,



# Information Technology and Medicine

**Shehnaz Midda**

**F.Y.IT.B**

Information technology has made significant contributions to our world, namely in the medical industry. Medical technology has evolved from introducing doctors to new equipment to use inside private practices and hospitals to connecting patients and doctors thousands of miles away through telecommunications.

The application of augmented reality technology is opening up new opportunities in the healthcare industry. New AR innovations can help enhance doctors and surgeons ability to diagnose, treat, and perform surgery on their patients more accurately by giving them access to real-time data and patient information faster, and more precisely than ever before.

Augmented reality will allow surgeons to precisely study their patients' anatomy by entering their MRI data and CT scans into an AR headset and overlay specific patient anatomy on top of their body before actually going into surgery. Surgeons will be able to visualize bones, muscles, and internal organs without even having to cut open a body. This could also help them determine exactly where to make injections and incisions and it could be used to display life-saving information for paramedics and first responders during a medical emergency.

EchoPixel develops medical imaging devices that enable doctors to use CT images of a patient's abdomen and display a 3D model. Their products allow doctors to render patient-specific anatomy leading to increased clinical knowledge, faster operations, and better care.



AccuVein uses augmented reality by using a handheld scanner that projects over skin and shows nurses and doctors where veins are in the patients bodies. AccuVein has been used on about 10 million patients, making finding a vein on the first stick 3.5x more likely.

Healthcare is one of the biggest adopters of virtual reality which encompasses surgery simulation, phobia treatment, robotic surgery and skills training. Medical VR is an area with fascinating possibilities. It has not just moved the imagination of science-fiction fans, but also clinical researchers and real-life medical practitioners. Although the field is relatively new, there are increasingly great examples of VR having a positive effect on patients lives and physicians work.



One example of this is the HumanSim system which enables doctors, nurses and other medical personnel to interact with others in an interactive environment. They engage in training scenarios in which they have to interact with a patient but within a 3D environment only.

Virtual reality is often used as a diagnostic tool in that it enables doctors to arrive at a diagnosis in conjunction with other methods such as MRI scans.

This removes the need for invasive procedures or surgery.

**“Information technology is at the core of how you do your business and how your business model itself evolves.”**

**Satya Nadella**



# Minecraft Earth

**Rithika Acharya**  
**F.Y.BSc.IT (B)**



Minecraft is a sandbox construction game created by Mojang AB founder Markus "Notch" Persson, inspired by Infiniminer, Dwarf Fortress, Dungeon Keeper, and Notch's past games Legend of the Chambered and RubyDung. Gameplay involves players interacting with the game world by placing and breaking various types of blocks in a three-dimensional environment. In this environment, players can build creative structures, creations, and artwork on multiplayer servers and singleplayer worlds across multiple game modes.

Minecraft being such a hit gameplay for the decade and now with the recent technology and Mojang's creative minds they come up with another product as Minecraft Earth.

Microsoft's *Minecraft Earth* brings the charming, blocky world of a decade-old game into meatspace (aka the real world). The augmented-reality app for iOS and Android allows players to build permanent game-world structures in real environments. Microsoft's cloud platform, Azure, saves players' creations and pins them to their physical location, so others will encounter them when they roll by. Visual touches like people occlusion—which makes it appear as though others walk around digital objects—make the scenes exactly the right mix of whimsical and immersive.

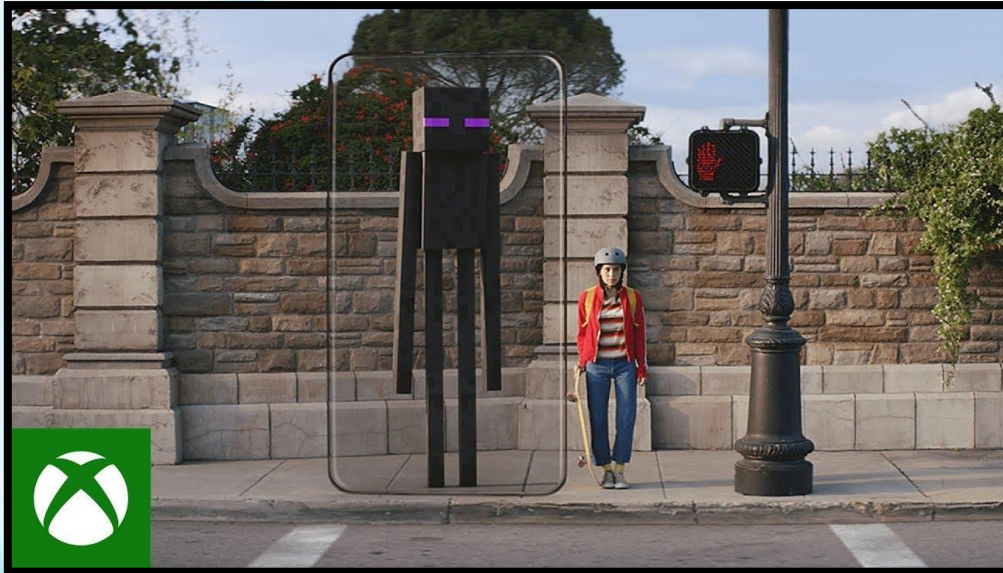
The Working of Minecraft Earth depends on 3 main factors they are explore, collaborate and create.

Explore: Your real-life neighbourhood takes on a whole new dimension thanks to Minecraft Earth. Gather resources, take on challenges, and share your imagination with others. There's a whole new world to discover!



**Collaborate:** Meet up with like-minded crafters and create masterpieces together. Work on a smaller scale with friends before taking your builds out into the wild at full size. You can even team up with others for mini-adventures!

**Create:** Minecraft has always been a game about creativity, but Minecraft Earth gives you the chance to express yourself on a whole new scale. Share your masterpieces and delve into others' creations!



Minecraft Earth was able to merge the real and the Minecraft world together through our smartphones with the help of the Microsoft and Mojang and the technology development that happened in the gaming industry. Minecraft is going to introduce another product as Minecraft Dungeons and thus raising the bar even high for other companies.

**“The value of networking. It is very important (in IT). There are so many resources out there that you can connect with for the latest updates, tips and tricks.”**

**-Ryan Ogilvie**



# Game Development Software

**Perna Shinde**

**F.Y.IT.B**

Playing a game can be defined as an activity that someone engages in for amusement. We play games because it's fun; it increases brain function, practices cognitive skills and releases serotonin, the happy chemical. As technology has advanced, the thrill and allure of playing games has only increased, with more visual stimulus, creativity, and satisfaction. Technological advances have provided new media for games throughout history. Game Development software helps individual developers, gaming companies, and educational institutions create, distribute, and monetize games. These solutions often offer additional capabilities such as user behavior analytics, marketing, and social features.

Some of the renowned software are Frostbite, Naughty Dog, Dice and Renderman, etc.



The first generation of Frostbite was designed and built in conjunction with the game Battlefield Bad Company. Based on DICE's experience with the largescale open world Battlefield series, Frostbite was an ambitious game engine that enabled large scale multiplayer interactions in dynamic destructible environments. Today Frostbite is the core piece of EA's one-team strategy; through the sharing of technology between studios we are creating a shared language for EA developers.

Their workflows and runtimes are highly configurable and cover all disciplines of development including Audio, Animation, Cinematics, Scripting, Physics, Destruction, Rendering, VFX, and more. Some of the famous games are Fifa18, Anthem, Battlefield, etc.

Naughty Dog is responsible for some of the most critically acclaimed and commercially successful games on Sony's PlayStation platforms. Through its use of cutting-edge technology and evocative, character-driven storytelling, Naughty Dog has received hundreds of industry

and media awards, while developing a passionate fan base of millions of players around the globe. Some of the famous games are The last of us, Uncharted, Jak and Daxter, etc.

DICE is the studio behind the Battlefield, Star Wars Battlefront, and Mirror's Edge series. Creating unforgettable gaming experiences is what makes them. An Electronic Arts company since 2006, they continue to push boundaries with creativity, passion, the powerful in-house game engine Frostbite, and the constant ambition to create something extraordinary for our communities. Some of the famous games are Battlefield, Star Wars Battlefront, Mirror Edge Catalyst, etc.



RenderMan is used throughout the industry for rendering Visual Effects and animation, making scalability and versatility one of its core strengths. RenderMan's subsurface approach significantly increases quality and realism when rendering skin and other soft or delicate materials.

**“You affect the world by what you browse.”**

**- Tim Berners-Lee**



## The Top New Of 2019

### \* YouTube

#### 1. Traversy Media

Brad has a comprehensive list of videos covering seemingly every programming topic. No matter what I'm learning, there's a walkthrough, along with the source code.



#### 2. Web Dev Simplified

This is a smaller YouTube channel, but Kyle's videos are succinct and to the point. Most intro-to videos I come across are at least 30-60 minutes, with some reaching upwards of 3 hours (looking at you FreeCodeCamp).



#### 3. Programming with Mosh

Even better than the videos, Mosh also writes blogs to his personal site. His blogs are usually straightforward and easy to understand.





#### 4. All Things JavaScript, LLC

Another small YouTube channel that consistently puts out videos every Wednesday. The format is presentations + code, which is helpful for understanding the theory, as well as seeing a concept in action.



#### 5. Dev Ed

Learn web development, web design, 3d modelling, tools like figma and more without getting bored! The goal of this channel is to get you to become as creative you can be! So if you like to create video games in Unity or develop an application in node.js, stick around and have fun!





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IMC RBNQ Certificate of Merit 2019  
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