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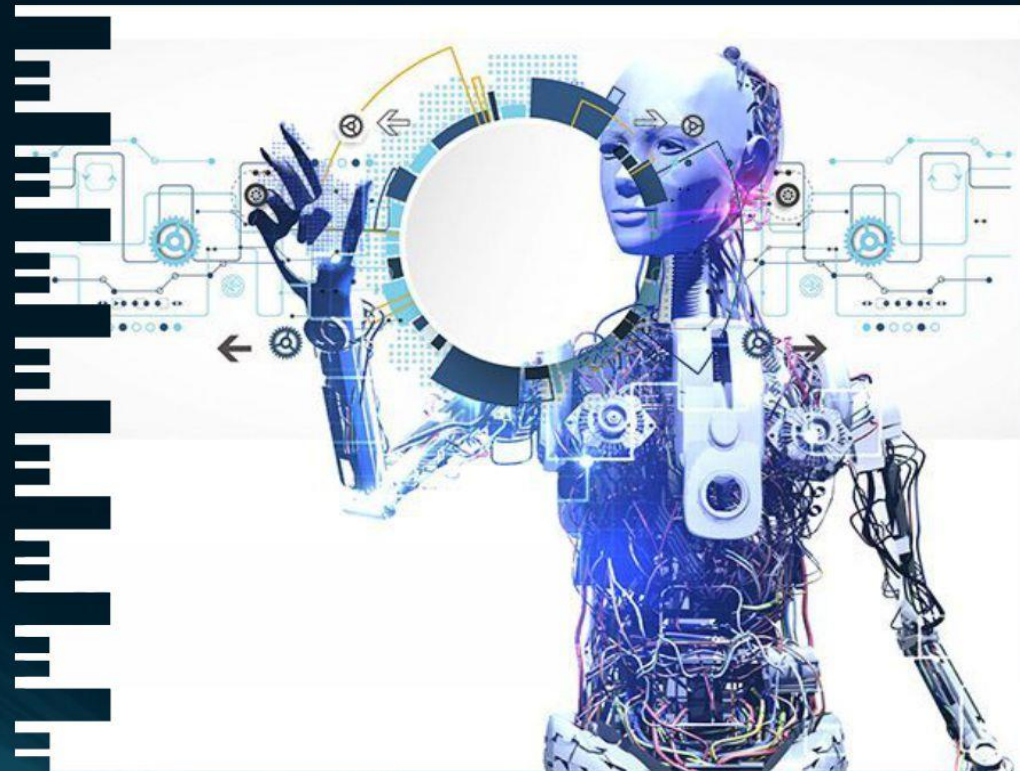October, 2019

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ELECTRONICA

NEED OF SOCIETY

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

ROBOTICS
PROCESS
AUTOMATION
FUTURE

Know About :

- SELF DRIVING CARS
- BATTERY OPERATED VEHICLES
- INTELLIGENT ICs
- FUTURE OF HOME AUTOMATION
- FUTURE OF ROBOTICS
- EVOLUTION OF ANDROID

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY GREATER NOIDA
Department of Electronics & Communication Engineering
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Approved by AICTE and Affiliated to Dr. A.P.J. Abdul Kalam Tech. University, UP

OCTOBER,2019

NIET
Greater Noida

GET FUTURE READY

VISION

To prepare the students for global competence, with core knowledge in electronics and communication engineering having focus on research to meet the needs of industry and society.

MISSION

M1: To become dynamic and vigorous knowledge hub with an exposure to state of art technologies for connecting world.

M2: To provide in-depth knowledge of Electronics and Communication Engineering ensuring the effective teaching learning process.

M3: To train students to take up innovative projects in group with sustainable and inclusive technology relevant to the industry and social needs.

M4: To empower students to become skilled and ethical entrepreneurs.

M5: To promote and adapt professional development in a perpetual demanding environment and nurture the best minds for the future.

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PSOs

PSO 1- To apply the knowledge of mathematics, science and electronics & communication engineering to work effectively in the industry based on same or related area.

PSO 2- To use their skills to work in modern electronics & communication engineering tolls, software and equipments to design solutions for complex problems in the related field that meet the specified needs of the society.

PSO 3- To function effectively as an individual and as a member or leader of a team by qualifying through examinations like GATE, IES, PSUs, TOEFL, GMAT and GRE etc.

PEOs

PEO-1 To have excellent scientific and engineering breadth so as to comprehend, analyze, design and solve real- life problems using state-of-the-art technology.

PEO-2 To lead a successful career in industries or to pursue higher studies or to understand entrepreneurial endeavors.

PEO-3 To effectively bridge the gap between industry and academics through effective communication skill, professional attitude and a desire to learn.
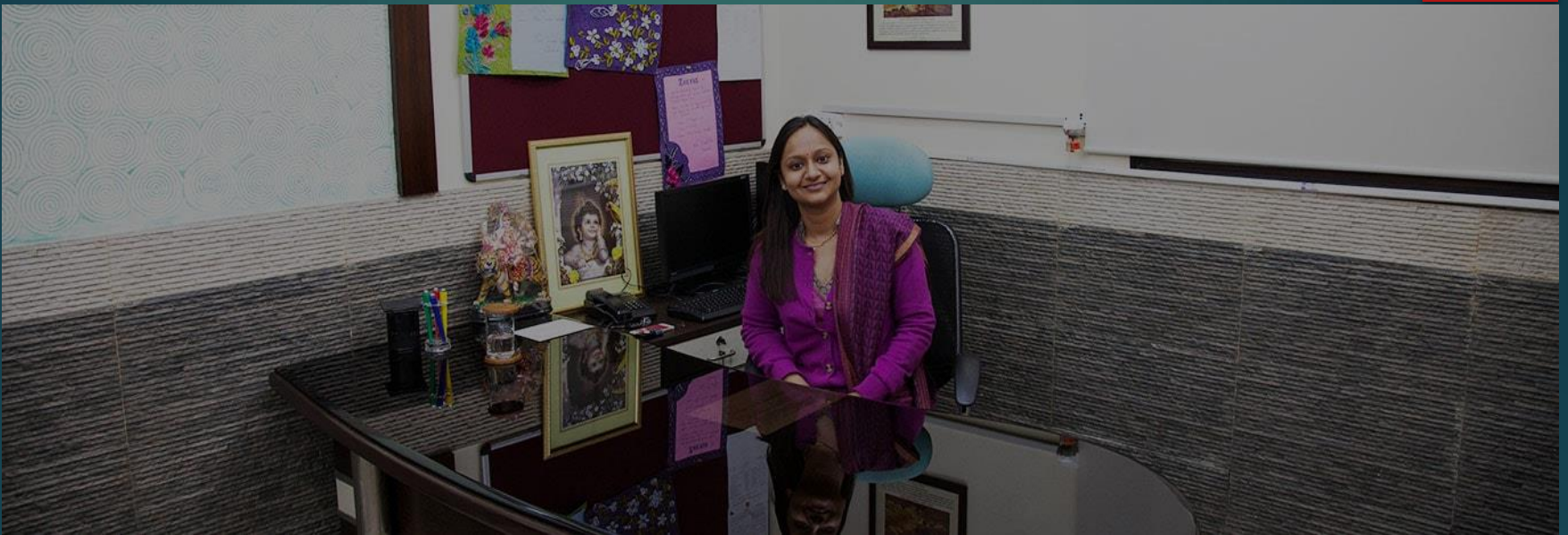
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FROM THE DESK OF THE MANAGING DIRECTOR

"Work is Worship"

*Dr. Om Prakash Agarwal (Managing Director)*Success is not a one-shot process. It is the result of a continuous improvement after each failure. The fear of failure needs to be captured in order for a person to learn from his failure too. It is an invaluable opportunity to rectify errors and move forward. Failure in working for a good cause is better than success in working for a wrong cause.

Over the years now, NIET has built quite a special position in the private higher education sector. With its distinctive culture, it provides a clear student-centered environment in which to explore existing technical knowledge, and gain new learning at the leading edges of technology development.

Our unique educational system ensures that you gain not just depth and breadth in your chosen area of specialization, but also a holistic set of skills that will equip you to face the real world. At every stage there will be opportunities to expand your boundaries, platforms for collaboration and learning, and recognitions for those who strive to excel. Thus, I would like each one of you to join NIET and aspire as global leaders and a successful human being.

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ADDITIONAL MANAGING DIRECTOR

"Education is the most powerful weapon which you can use to change the world" - Nelson Mandela

Dr. Neema Agarwal

In the course of last 20 years many technical & management institutes have sprung up all over the country. Graduates passing out every year are highly optimistic, that technical courses ensure a rewarding career.

The economic, corporate and social environments are undergoing radical changes. To survive, manage and excel in this dynamically changing atmosphere; it demands engagement of professionals who are well informed, competent, courageous and versatile.

Beyond the academics, the curriculum at NIET is strongly linked with several recent themes like latest technologies needed by organizations, soft skills, communication, among others. Our approach has resulted in programs of study relevant to the leadership trends and challenges of tomorrow. Classroom learning is made interesting by highly qualified and experienced faculty through interactions, presentations, role plays, case studies and out bound learning programs. This is further reinforced by practical learning through Industrial visits and summer training. Students regularly undergo personality development and grooming sessions that leads to both extrinsic and intrinsic confidence boosting and prepares them for the corporate world.

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OCTOBER,2019

FROM THE DESK OF EXECUTIVE VICE PRESIDENT

Mr. Raman Batra

This new generation is an interesting one. Most of them are born in a world where technology has always been at the forefront. These students rely on Google, texting, social media and Wi-Fi, and they view email - not letter writing - as a formal form of communication.

NIET has been helping students write their own stories since its inception. Committed to providing the best jobs by creating life-changing educational opportunities and collaborative learning environments, we have stayed at the forefront of innovation in higher education, providing the tools our students need to make them industry ready from day one and make an impact in the world.

NIET has a Pyramid Finishing School, which provides training to the students according to the industry requirements giving the individual student a 360 degree in employability skills. The Institute has also made tie-ups with MNCs like Microsoft, Oracle, KPMG, ICICI Direct, Prometric and Pearson. These tie-ups not only promise to enhance student employability by manifold, but also take the lead in encouraging 'innovative' learning like never before. Taking the league forward, we have established various innovation labs to provide students hands-on experience in various modern-day technologies.

I, thus, invite you to join our movement to create Corporate Citizens who become role models, wherever they go, for developing their professional career. I promise you a challenging academic experience, with an international flavor, which will truly transform your lives.

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Welcome you to the Noida Institute of Engineering & Technology, Gr. Noida. Ever Since its inception in 2001 our endeavor at NIET has been to provide excellent quality of education and training to young minds aspiring to become engineers, managers, pharmacists and technocrats.

In order to achieve this goal we have established an infrastructure that compared with the best in the world. Our faculty members are highly talented and qualified. Additionally, we invite the finest minds from the industry and academia as guest lecturers. With the help of a very supportive staff we ensure a healthy learning atmosphere for our students.

We motivate our students to dream big and guarantee that we inculcate de the right spirit and the necessary talent to realize their objective. We also continuously strive to instill ethical values in our wards so that they become responsible citizens of tomorrow.

NIET has always stood for quality and excellence and we make every effort to constantly assess and improve ourselves. These efforts have been recognized, appreciated and awarded by prestigious educational bodies both in India and abroad.

I wish you the very best as you choose to become a part of this exciting and vibrant learning community.

Dr. Vinod M Kapse

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MESSAGE FROM THE HOD

It is a matter of great pride for the department of ECE that *Electronica* is getting wide response from the student's community. The editors of *Electronica* wish to ignite their readers to dream for the highest order of technical advancements in the area of Electronics and Communication Engineering.

I acknowledge the contributions made by the authors and the hard work of the Editorial Board members who managed against all odds and obstacles to bring out the magazine. This magazine has proved its worth by inspiring many students and faculty members to write articles for the benefit of students at large. I look forward to hearing from the readers. Their feedback and contribution of articles for future issues is greatly desired.

Dr. V K Pandey

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OCTOBER,2019

Robotics Process Automation : challenge

Jitendra Saroj
ECE

Before computers came into existence, humans used to do all the hard work with limited means available at hand. With the advent of computers, massive storage of data and calculations have become possible with a single mouse click. But still, a human is needed to operate the system. Now, the ever-evolving technology can take out the humans too out from the equation.

Imagine yourself telling your computer to do this, do that and finish that report for you. Is it really possible and effective?
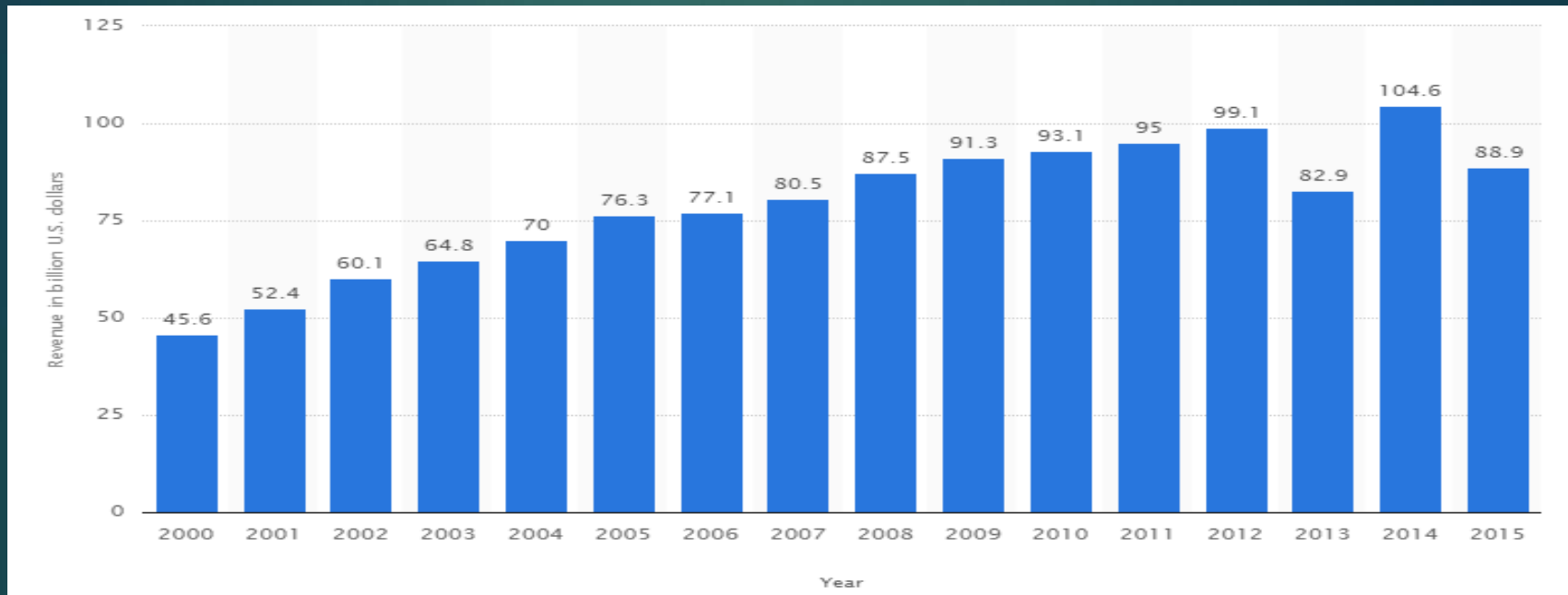
▶ The answer is yes.

This is exactly where Robotic Process Automation (RPA) comes into play. RPA systems are used to automate basic and repetitive office tasks.

A technology like this can have massive impact on the future of Business Process Outsourcing (BPO).

▶ **BPO Industry in numbers**

According to Gartner, worldwide IT services market will reach $929 billion in 2016, growing 3.8% in constant currency in 2016, or 2.1% in U.S. dollars. With outsourcing contributing 60% of market growth in constant currency, the market will reach $1.1 trillion in 2020. Due to high quality of work and availability of skilled talent at lower rates, Indian BPOs have become the go-to firms for outsourcing voice-based and non-voice based jobs.

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Source: Statista

In FY2016, NASSCOM expects Business Process Management (BPM) industry to generate $166 billion in revenue. The Indian IT-BPM sector continues to be one of the largest employers in the country directly employing nearly 3.5 million professionals.

Above facts and figures imply that the BPO/BPM industry is huge and companies are paying a fortune to outsource their workload.

▶ **RPA – The BPO Killer!**

As already mentioned above, it could be much easier and effective if we can make a machine that would do all the boring yet important work for us. But, why would we hand over a task to a computer, when we can outsource the work?

Contrary to what many people believe, implementing a software solution to do all the routine office jobs automatically, is actually cheaper. But, can a system actually do the same kind of work that a human does?

Yes, it can. But, it needs to be trained first. So, we can not rule out humans entirely.

A RPA system can do common office tasks like generating reports, collecting information from existing documents, extracting and sorting information, etc. automatically. Such software solution can be deployed on-site or hosted on cloud depending on security and compliance requirements. One of the salient features of RPA system is that once it has been configured and set up according to the business requirements, it can then proceed to work on its own.

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Applications of RPA

Most of the clerical jobs in any office involve collecting data from paper or digital format, sort them out or extract particular information as required and finally produce the result. However, we don't need to waste valuable time of workers anymore for such mundane tasks. A RPA system will be able to do these tasks once we configure them to do so.

This data processing can be done in different domains like banking, finance, insurance, healthcare, legal services etc. In order to utilize the RPA system, it doesn't matter which domain you are in as long as you have documents to process and results to be produced automatically.

Conclusion

There are already fully functional RPA systems in use, which can automatically complete any repetitive task a human being does, that too in smarter ways using cognitive technology. Due to huge benefits offered by RPA in terms of cost and operations management, a radical shift is expected to take place in the Back Office and BPO sector.

After all, why waste time, money and resources when a computer can do a smarter job!

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SELF DRIVING CAR

Airplane pilot is still a career that elementary school kids tell their teachers they want to be when they grow up, alongside firefighters. Pilots command a lot of respect from the public for their skills, but what most people do not know is that the majority of the flight is controlled by computers rather than the pilot. Once the cockpit doors close, the pilots could take a nap and the passengers would not know the difference.

Pratik Raj
ECE

However, when it comes to driving vehicles, handing over control to autonomous vehicles will be a much more difficult transition, as most of us drive on a regular basis and are used to having cars respond to our every command. Statistics show that machine-driven vehicles boast better safety records than human-driven vehicles, but these have had little impact on human perception. Some of the companies developing autonomous vehicle technology have driven their cars millions of miles with fewer at fault accidents than you can count on one hand. Humans have a hard time meeting that standard. The reason we trust airplanes is that we see a human in command and assume that a human mind is at work keeping us safe. Humans like to be in control, as evidenced by the fact that manual-transmission cars are still common despite the developments of advanced automatic transition technology. To gain the trust of humans enough to let computers drive us around, we need to abandon any assumptions that we will make an instant switch from driver to driverless and accept that there will be a transitional period, starting with basic functions like automatic braking, lane keeping assistance and hands-off parking. Even airplanes took many years to transition functions away from pilots, who controlled take offs and landings manually until very recently. In order to gain the trust of passengers we need to make sure that the underlying technology of cars is working at a high standard of excellence.

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The same way the DMV makes all prospective drivers take an eye exam, automated car developers need to make sure their vehicles are not operating blindly. There are several different technologies being leveraged to help cars "see" the world around them and react to the changing environment. Each has its own set of limitations and requirements for reliability.

Cameras : The most simple of the current methods for sensing the world, cameras use light waves to detect the world. They must be supported by advanced machine-learning technique for image recognition, but they are the most effective at recognition shapes, such as obstacles in the road or letters on a sign. However, their effectiveness can be limited by conditions such as light, strong rains or darkness at night that affect a vehicles ability to accurately detect and respond to changes in its environment.

Radar : Based on the same technology used for airplane navigation, these systems provide the most accurate representation of the distance of physical objects by using electromagnetic waves. The more sensors put on a vehicle the more accurate the picture, but this increases the likelihood that they will interfere with each other. Different frequencies can be used to develop different understandings of the world from general long-range impressions, to detailed close-range pictures.

LIDAR These systems use pulsed laser light and their reflections +o develop precise understandings of the world. They are best-used for high-definition close-range imaging. Like cameras, they are highly susceptible to environmental issues, especially as changing right levels require different calibrations.

V2X : Vehicle to vehicle, vehicle to signs, vehicle to cloud, vehicle 1·0 everything communication. Connecting vehicles to the world around them by using the wireless communications holds great potential for safer driving. With these kinds of connections, cars can know the intentions of other cars around them and adjust more efficiently than human reactions can. They also inform on changes in traffic flow beyond the line of sight of their other sensors, such as stopped or slowed traffic around a corner. Implementing this requires a great investment in infrastructure and standardized communication from all vehicles. It will also place stringent requirements on improving the reliability of wireless connections, especially while moving at high speeds.

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OCTOBER,2019

rigorous testing against a range of potential environments, These sensors and signals can be affected by the chaos of signals around them, weather conditions like snow or rain as well as hardware limitations, Despite these challenges, they must produce consistent and accurate results every time for humans to fully trust these systems IO take the wheel.

Car manufactures are now facing increasing demand for innovation and dependability of electronics engineering components of their vehicles, even more than the mechanical. Getting these sensors right are key to the future of autonomous driving, they will help ensure operational efficiency of driverless vehicles while ensuring human trust.

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Tensor Processing Unit

The Tensor processing Unit (TPU) is Google's custom tool to accelerate machine-learning workloads using the Tensor Flow framework.

In 2017, Google announced a Tensor processing Unit (TPU) — a custom application-specific integrated circuit (ASIC) built specifically for machine learning. A year later, TPUs were moved to the cloud and made open for commercial use.

Following the line of CPUs and GPUs, Tensor Processing Units (TPUs) are Google's custom-developed application-specific integrated circuits (ASICs) that are supposed to accelerate machine learning workloads. They are designed specifically for Google's Tensor Flow framework, a symbolic math library that is used for neural networks.

Tensor Flow is known to be not an easy nut to crack. To ensure a better understanding of the concept of a tensor, the TPU structure, and how it works, we'll try to give a brief and simple overview of the technology.

Logic behind TPU

To simplify the process of neural network training, TPUs address this issue in several directions:

1. Quantization

In line with the **quantization technique,** the process of approximation of an arbitrary value between a preset minimum and a maximum value with an 8-bit integer, TPUs contain 65,536 8-bit integer multipliers. In essence, this technique is compression of floating-point calculations with 32-bit or even 16-bit numbers to 8-it integers.

Quantization is the first powerful tool TPUs use to reduce the cost of neural network predictions without significant losses in accuracy.

Focus on inference maths

Secondly, the TPU design itself encapsulates the essence of neural network calculation. A TPU includes the following computational resources:

Matrix Multiplier Unit (MXU): 65,536 8-bit multiply-and-add units for matrix operations;

Unified Buffer (UB): 24MB of SRAM that work as registers;

Activation Unit (AU): Hardwired activation functions.

They are controlled with a dozen high-level instructions that focus on the major mathematical operations required for neural network inference. A special compiler and software stack translate API calls from Tensor Flow graphs into TPU instructions.

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OCTOBER,2019

3. **Parallel Processing**

Typical RISC processors provide instructions for simple calculations such as multiplying by processing a single, or scalar, operation with each instruction. As you remember, a TPU contains a Matrix Multiplier Unit. It is designed as a matrix, rather than scalar, processor, and processes hundreds of thousands of operations (= matrix operation) in a single clock cycle. Using such a matrix processor is like printing documents a whole page at a time rather than character-by-character or line-by-line.

4. **A systolic array**

The heart of the TPU is the new architecture of the MXU called a **systolic array.** In traditional architectures (such as CPUs or GPUs), values are stored in registers, and a program tells the Arithmetic Logic Units (ALUs) which registers to read, the operation to perform (such as addition, multiplication or logical AND) and the register into which to put the result. A program consists of a sequence of these operations. In an MXU, matrix multiplication reuses inputs many times to produce the final output. A value is read once but used for many different operations without storing it back to a register. The ALUs perform only multiplications and additions in fixed patterns, and wires connect adjacent ALUs, which makes them short and energy-efficient.

Advantages of TPU

Using TPUs offers a number of advantages in terms of increasing efficiency and speed of computation, including the following benefits:

Accelerated performance of linear algebra computation, which is used heavily in machine learning applications.

Minimized time-to-accuracy when training large, complex neural network models: models that previously took weeks to train can converge in hours on TPUs.

Scalable operations across different machines with their TPU servers.

TPU Limitations

An important thing to understand is that TPUs are specifically optimized to perform fast, bulky matrix multiplication. Cloud TPUs are likely to be outperformed by other platforms in workloads that are not dominated by matrix multiplication, such as:

Linear algebra programs that require frequent branching or are dominated element-wise by algebra.

Workloads that access memory in a sparse manner.

Workloads that require high-precision arithmetic.

Neural network workloads that contain custom Tensor Flow operations written in C++, specifically, custom operations in the body of the main training loop.

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LI-FI (LIGHT FIDELITY)-SUBMITTED BY:

SUMIT SHARMA
PRIYANKA TARIYAL
NISHANT ROUNAK

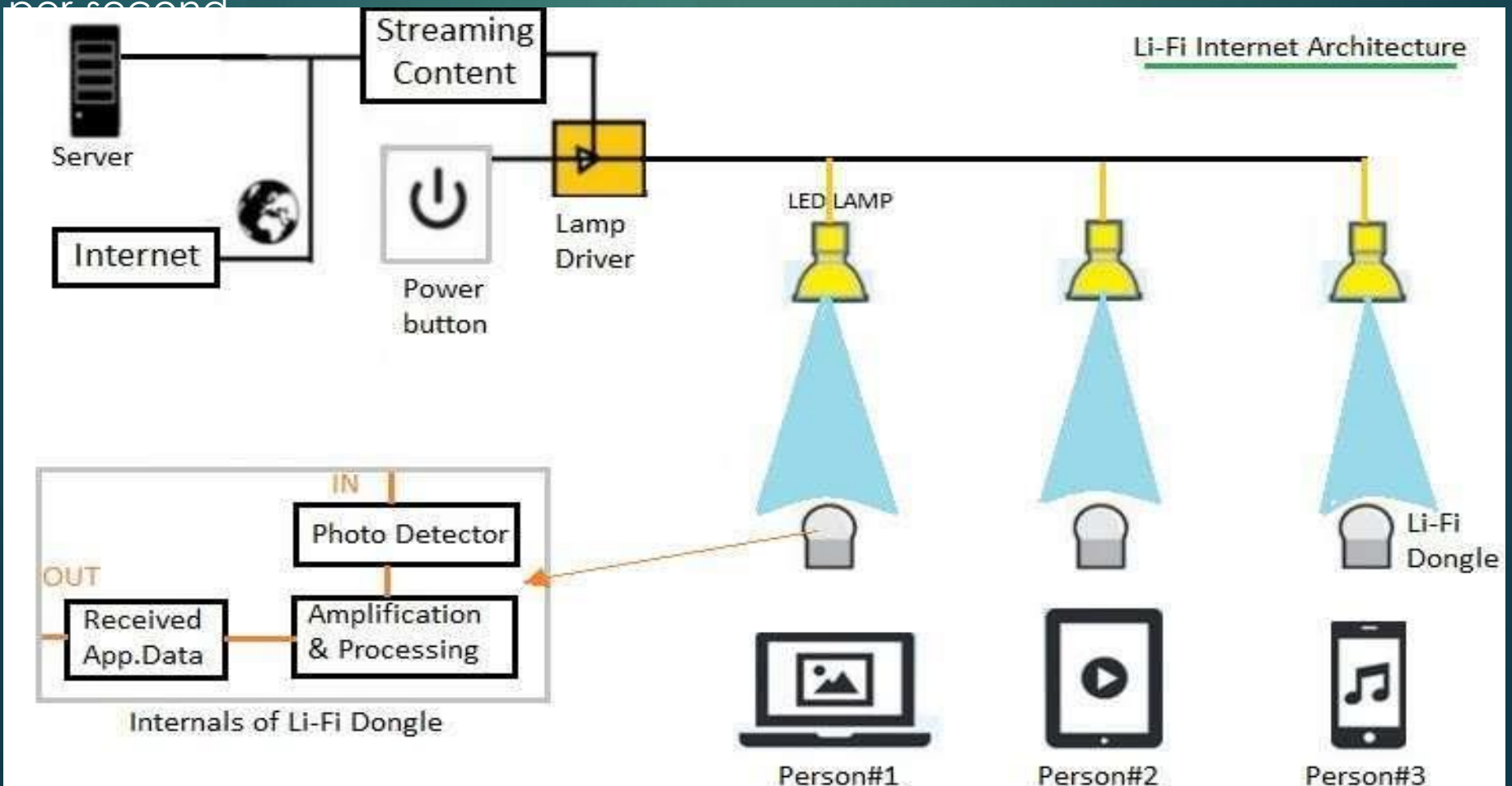## INTRODUCTION:

Li-Fi (short for *light fidelity*) is wireless communication technology, which utilizes light to transmit data and position between devices. The term was first introduced by Harald Haas during a 2011 TED Global talk in Edinburgh.

CONSTRUCTION:

Li-Fi is a wireless optical networking technology that uses light-emitting diodes (LEDs) for data transmission.

Li-Fi is designed to use LED light bulbs similar to those currently in use in many energy-conscious homes and offices. However, Li-Fi bulbs are outfitted with a chip that modulates the light imperceptibly for optical data transmission. Li-Fi data is transmitted by the LED bulbs and received by photoreceptors. Li-Fi early developmental models were capable of 150 megabits-per-second. Some commercial kits enabling that speed have been released. In the lab, with stronger LEDs and different technology, researchers have enabled 10 gigabits-per-second.

Li-Fi Internet Architecture

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WORKING:

• *As shown lamp driver is connected with internet on one end and with LED lamps on the other end. Streaming content from internet are pushed to the LED lamps through Lamp driver software.*
• *LED lamps are placed at different locations as per requirement in the office or home premises for multiple users.*
• *Li-Fi dongle is used in order to use Li-Fi internet services by various users. As shown Person#1 is browsing internet in Laptop, Person#2 in tablet and Person#3 in smartphone.*
• *As shown LiFi dongle is composed of photodetector amplification & processing and applications for different types of data.*
• *All the LED lamps can be swithed on and off using a power button switch provided.*
• *Li-Fi internet provides very fast data rate at 1 Gbps speed.*

AVANTAGES OF LI-FI:

1) speeds than Wi-Fi.
2)10000 Higher times the frequency spectrum of radio.
3) More secure because data cannot be intercepted without a clear line of sight.
4) Eliminates neighboring network interference.
5) Unimpeded by radio interference.
6) Does not create interference in sensitive electronics, making it better for use in environments like hospitals and aircrafts.

Differences between Li-Fi & Wi-Fi

The Differences between Li-Fi and Wi-Fi include the following.
The Bandwidth Expansion of Wi-Fi technology is limited and exceptional for Li-Fi
The Speed of the Wi-Fi is150 Mbps and >10 Gbps for Li-Fi
The Data Density of Wi-Fi technology is low and high for Li-Fi
The Range of Wi-Fi is medium and low for Li-Fi
The Security of Wi-Fi is medium and excellent for Li-Fi
The power availability of Wi-Fi is low and high for Li-Fi
The ecological impact of Wi-Fi is medium and low for Li-Fi
The cost of the Wi-Fi is medium and low for Li-Fi
The network topologies of Li-Fi and Wi-Fi technologies is a point to point

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Puneet Shakya
ECE

Generation of Android

As we all know in today's world every guy has a smartphone and smartphone can perform all the tasks that an PC can perform. But have you ever wondered on which thing this smartphone and other mobile devices works

Its none other than the Android the base of a smartphone or in other we can say the backbone of the smartphone.

Basically Android is an operating system by which we can perform various daily tasks in our Smartphone, Tablets, smart watches, Android T.V etc.

History of Android

Android was started in year 2003 by Android Inc by Andy Rubin. Google purchased the company in 2005 and Andy Rubin was made the Head of Android OS department officially the first Android was Launched in year 2007. Do you know The first phone based on Android OS ? didn't know I will tell you, it Was the HTC dream. Later Andy Rubin left his Post for his new project.

Versions of Android

1. Android cupcake 1.5v was the first Android version with support of big Screen

2. Android 1.6v donut with enhanced user Experience, navigation, search integration

3. Android Éclair 2.0v with enhanced touch, Bluetooth 2.0, Live wallpapers

4. Android froyo 2.2v with the home screen Interface improved

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5. Android gingerbread 2.3v with calls via Internet

6. Android honeycom 3.0v with the OS only In Tablets

7. Android Ice cream Sandwich 4.0v with default font, google play services

8. Android 4.1v Jellybean with google now, Speak to write, buttery smooth interface.

9. Android 4.4v KitKat with google keyboard Emoji

10. Android 5.0v Lollipop with cast screen, Battery optimization

11. Android 6.0v Marshmallow with USB type-c Support, permission to apps

12. Android 7.0v Nougat with quick setting Multiwindow, direct message via notification

13. Android 8.0v Oreo with notification grouping Bluetooth 5

14. Android 9.0v pie with support to notch Display, improved multitasking

Upcoming Android Version

Android 10 or the Android Q is the first Beta version of Android Q was released on March 13, 2019 exclusively on pixel phones Soon the android version will be rolled out in. All other devices via update

000Features: improved navigation, user interface Privacy and security etc.

Fact about Android

Google keeps its Android version on the name Of desserts and by version by version in an Alphabetical order.

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Jyoti Baisoya

EC

GLOBAL MAGNETIC SENSOR MARKET

Global Magnetic Sensor Market is Driven by Internet-of-Things (IoT) in Various Industrial Applications, Smart Products and Advancements in the Automotive Industry What is A Magnetic Sensor? A magnetic sensor is a small-scale micro electrochemical system (MEMS) device for detecting and measuring magnetic field . This sensor acts as a transducer which varies its output voltage in reaction to a magnetic field. Sensor These type of sensors are proximity switching, speed detection, positioning , and current sensing applications . Moreover, these sensors also detect changes and disturbances in a magnetic field , like flux, strength , and direction . Future Market Insights (FMI) 'Magnetic Sensor Market-Global Industry Analysis 2013-2017 and Forecast 2018-2028' Report . The global magnetic sensor market is expected to expand at a CAGR of 4.8% during the forecast period . The global magnetic sensor market was valued at US$ 1,906.1 Mn in 2018, and is projected to increase significantly to reach US$ 3,053.5 Mn by 2028 . This growth is envisioned due to an increase in the demand for magnetic sensors for multiple applications in automotive IoT.

This report includes magnetic sensors which are based on Hall Effect, AMR (Anisotropic Magneto- Resistive),GMR (Giant Magneto-Resistance), And TMR (Tunnel Magneto-Resistance)technologies. The global magnetic sensor market is categorized   by technology ,application and region. By technology, the market is segmented as Hall effect, AMR (anisotropic magneto-resistance), and TMR (tunnel magneto-resistance).On the basis of application , the global magnetic sensor market is segmented by industrial , automotive , consumer electronics , and others.

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X-RAY SCREENING & BIOMETRIC SYSTEMS

Nidhi
ECE

The approximately US$ 7.8 billion market for security screening is highly likely to approach the revenues worth US$ 10 billion in the next two years. As indicated by a newly launched research report by Future Market Insights(FMI), more than half of the total demand for security screening is being accounted by the developed regional markets. East Asia however is cited as the most lucrative market for investors in security screening systems and solution. Rapid growth in the economy, necessitating increasing expenditure on the national and infrastructural security, will continue to push deployment of reliable and advanced technology enabled security screening systems. While FMI's analysis identifies an impressive rate of adoption within emerging economies, China, India, and Russia are likely to be at the forefront of this growth, in the security screening market. Explosive trace detectors, currently accounting for nearly 1/4th share of the total sales of security screening systems, will reportedly witness strong growth in demand through the coming years. According to the report, X-Ray screening systems and biometric systems are also highly popular among the end-use application areas in security screening market. The collective market value share of the aforementioned security screening systems is just-under 50 % and the report expects attractiveness of the latter to surge – with growing adoption of fingerprint and face recognition technologies . Looking at the loopholes in current security screening models in terms of efficiency and sustainability, airports have been accelerating the industry's shift to smart security screening solutions, over the recent past.

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Global Automation as a Service Market

Prabhat Kumar Biswal
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Tile growing technological advancement have changed the way we function in our day to day life. It has eased several processes in our personal and professional lives. Auto as a service market is one major technological advancement that we are witnessing now a days. The global automation as a service market is predicted to grow at a tremendous rate in the forthcoming years.

Automation refers to a process of mechanizing a series of operations. This is done by capturing and interpreting repetitive and high-volume processes. The automation service is which is delivered via cloud is known as automation as a service. It deals with several process such as triggering responses, interpreting data, and communicating with other digital systems. Previously, these operations called for tremendous labor. Owing to this businesses had to deal with several flaws like manual errors, slow functions, and labor monotony. Automation as a service is shaping the way reparative way is performed in business unit as well as home, It helps in reducing inconsistencies from business environments and minimize errors, thereby enabling effective business processes. Automation as a service is widely accepted in organizations now a days. This is because of its ability to shift from slow manual processes to reliable, fast automated ones. The increasing adoption of cloud technology among the business unit is one strong factor expected to drive the global automation as a service market. The technology is already used in several business functions such as IT, finance, marketing and sales, operations, and HR. The increasing demand for automation across business process holds immense scope for automation across a number of business verticals. The automation as a service market has high capability to grow in future owing to its ability to perform the mundane tasks efficiently. Some of the industries which improving their business process with the help of automation as a service market are BFSI, healthcare, and telecommunications and IT.

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