

# Department of Electrical Engineering



# Electrika-21

**Bhai Gurdas Institute of  
Engineering & Technology, Sangrur  
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I H.O.D EE hereby declare that the particulars given above are true to the best of my knowledge and belief.

**Er. Sushil Kakkar**

HOD Electrical Engineering

Dated 15 June 2019

## **Vision of Department**

It is aimed to provide the finest environment for teaching, learning, research, innovation and character building so as to mould youth of today into world class technocrats of tomorrow who would Endeavour to increase the quality of life for mankind.

## **Mission of Department**

M1 -- To evolve as an innovative & globally competent Electrical Engineering department that contributes to the socio - economic growth of region by utilizing the advancement in Electrical Engineering by providing conducive learning and interactive environment to students and faculty.

M2 -- To impart the quality education and enhance skills for developing globally competent Electrical Engineers.

M3 -- To provide state –of –the –art facilities and opportunities to create, interpret, apply and disseminate knowledge.

M4 -- To develop students and faculty to cope up with modern technology with research attitude to meet industry standards effective industry interface.

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## DIRECTOR'S MESSAGE



Dr. Tanuja Srivastava  
Director, BGIET

It is matter of immense pleasure for me that the Electronics & Communication Department Engineering of BGIET, Sangrur committed to excellence through technology is going to launch Annual Magazine “Electrika-19”. This will provide a common platform to Students, Faculty Members and Eminent Engineers to share their ideas and technological assets to translate innovations from basic knowledge to quality products for better returns and competitions at the global level. Besides it will encourage the young students for recognition of their new innovations and technologies at the Institute Level. I congratulate those students and Faculty Members who have contributed and urge other to avail the opportunity next time.

With Best Wishes  
**Dr. TanujaSrivastva**

## HOD's MESSAGE



Dear students,

It is a matter of great pride & happiness that the third edition of the Electronics magazine “Electrika-19” is in your hands. You are reading your own creative & technical output. It is an endeavor by the college to provide you with an opportunity to look beyond the mundane routine. I take this opportunity to thank the many people who have made this launch of the magazine possible. First and foremost are the authors of various articles and editorials whose works over the years have made the magazine a reality and I also thank the Publications Board and publications staff of this magazine who have extended themselves to make this magazine possible. Finally, I want to thank all of our readers both those who have been with us for many years and those who have only recently discovered the magazine. It always a pleasure when a reader comes up to me at Semi-Term or writes to me about how much they enjoy the magazine and how useful they have found one of the articles.

Keep it up. Wishing you good luck.

**Dr. Sushil Kakkar**

HOD Electrical Engineering

## EDITOR'S MESSAGE



It gives immense pleasure to bring out the college magazine “Electrika-2021”. This magazine has been an effective platform for students and staff to express their talents and hidden skills. we would like to take this opportunity to express our sincere thanks to all The Director, HODs and Faculty members of BGIET. We thank the Editorial Board Members for their information suggestions and advice. We are indebted to the student members of the Editorial Board for their seamless efforts in bringing out the magazine in a colorful way.

**Er. Puneet Chopra**

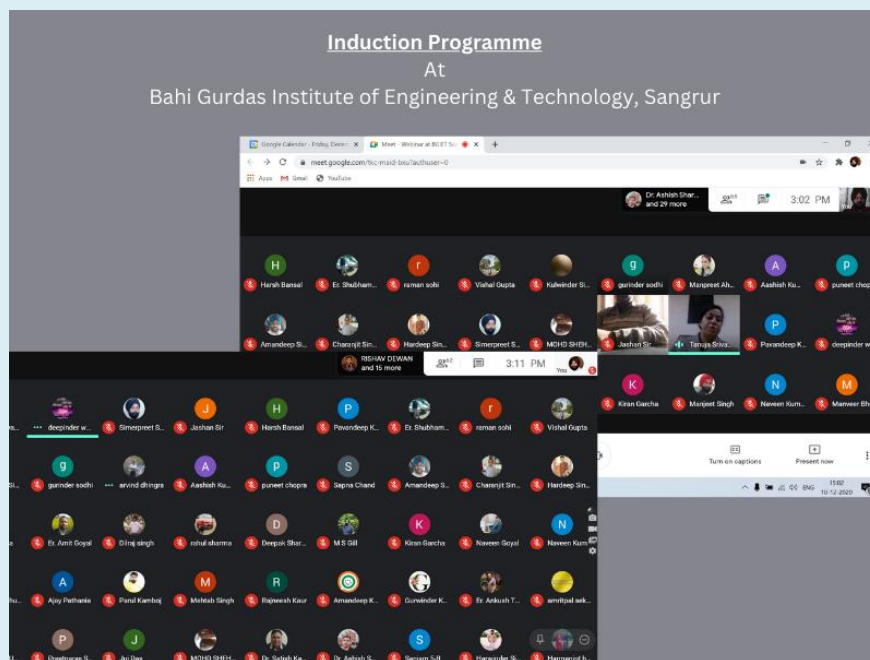
A.P. Electrical Engineering

## EE Department Activities

# INDUCTION PROGRAM

Induction programme is an informative and educative program to groom and nurture young engineering students to mould fraternity in the days to come. The Induction Programme for the students of FIRST YEAR Engineering was held in the month of August 2020 organized by Bhai Gurads Institute of Engineering and Technology.

The aim of the program was to give the students who are joining the college a bird's eye view about various dimensions of engineering and the career opportunities for the engineering students and to acquaint them with the systems and procedures of the college. The idea was to make the students aware of their prospective opportunities and to show them the path they have adopt in order to become successful engineers.

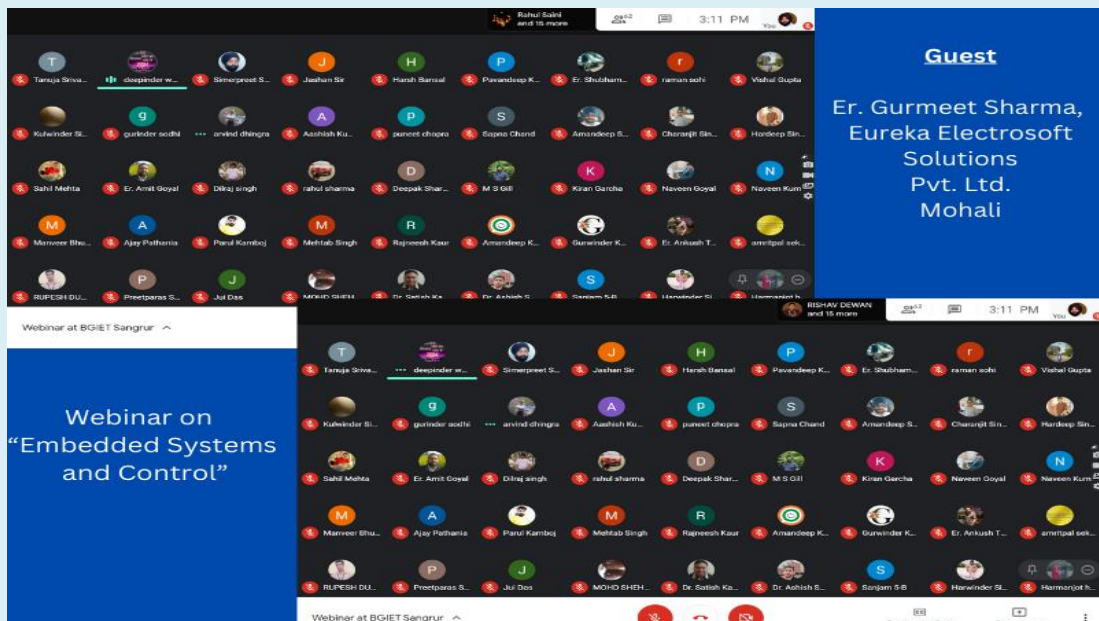


The Programme started with the Poster and Project exhibition by the first year students on the Theme “Innovate & Incubate”. The programme continued with the National Anthem followed by Lamp lighting. The Director Dr. Tanuja Srivastava welcomed the gathering with the speech about the academic community. She advised the students to update their selves with recent technologies to survive in revolutionary and competitive era.



# WEBINAR ON “EMBEDDED SYSTEMS AND CONTROL”

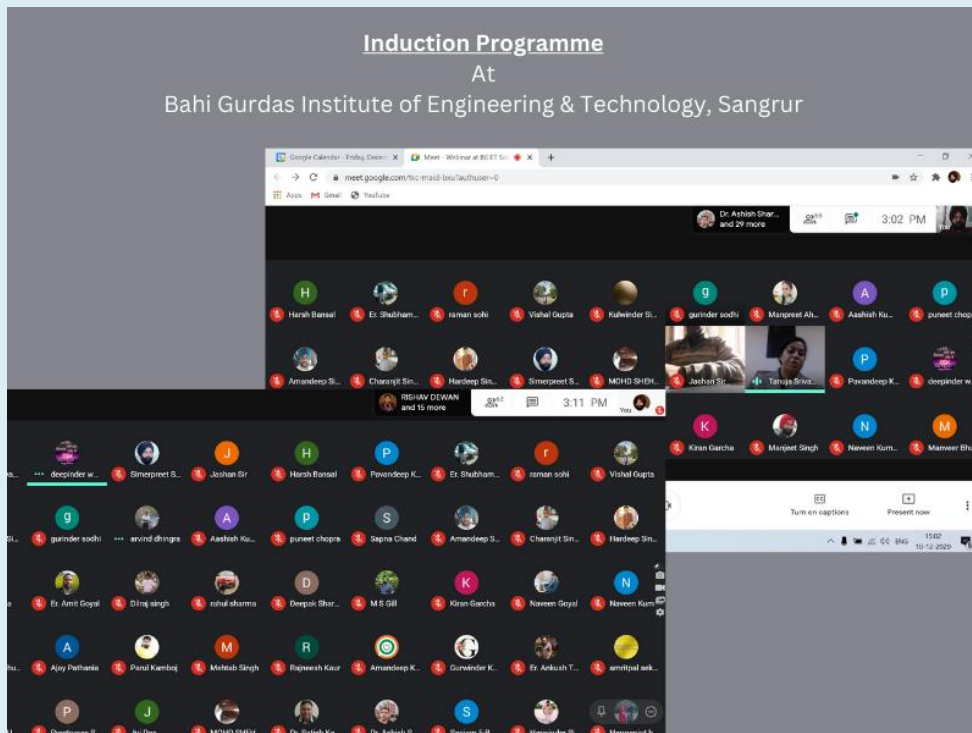
Department of Electrical Engineering arranged a webinar on “Embadded System and Control” the chef guest for the event was Er. Gurmeet Sharma, Eureka Electrosoft Solutions Pvt. Ltd.. He illustrated about the Arduino hardware development platform is used by hobbyists, professionals, and students interested in electronics. Arduino boards are especially popular with people new to electronics, due to their beginner-friendly nature and the vast community of users. Below, we explore some of the best online simulators you can use as an alternative to Arduino boards when you can't buy one or don't have access to one. The Arduino platform comprises a programmable microcontroller board and an integrated development environment (IDE). Most Arduino boards are built around an 8-bit Atmel AVR microcontroller chip with a variety of additional features including analog inputs/outputs, digital I/O pins, as well as special function pins such as serial ports or SPI connections for high-speed communication with other devices like MP3 players or GPS receivers.1. Simulators are great for beginners.



Starters in electronics are either hindered by their limited knowledge of coding or their inexperience with constructing circuits. Some simulators use block-based programming, which makes it easier to define the operation of the electronic components. Also, some simulators are designed to select the best form of wiring when you're connecting components to the digital board which cuts the work down for you.

# WEBINAR ON “SMART CONTROLLERS”

Smart controllers are devices used in various industries, including manufacturing, agriculture, and energy, to control and optimize processes automatically. They use sensors, data analysis, and machine learning algorithms to make real-time adjustments to the process and improve efficiency, productivity, and quality.



Department of Electrical Engineering of BGIET, Sangrur invited Er. Ramandeep Grover, Techpacs Research and Innovation Services, Mohali, for better understanding of controllers in the daily routine and Industry. Moreover, the students interacted with the guest via online and discussed their doubts. The guest also explained the different types of controllers such as PCL & Microcontrollers like 8051 to impart knowledge of their industrial uses.

## Guest Lecture on “Electronics Devices”

Electronic devices have become an integral part of our daily lives. From smart phones, laptops, and tablets to televisions, gaming consoles, and smart watches, electronic devices have revolutionized the way we communicate, learn, work, and entertain ourselves. Department had invited Er. Madhusudhan, Semiconic devices pvt ltd. New Delhi, in his lecture he described the latest trends and applications of electronic devices. These devices rely on complex technologies such as microprocessors, sensors, displays, and wireless communication to perform their functions. However, the widespread use of electronic devices has also raised concerns about their environmental impact, as they contain hazardous materials and generate electronic waste. Therefore, it is crucial to promote sustainable practices such as recycling, reducing energy consumption, and using eco-friendly materials in the production of electronic devices. He concluded that electronic devices have transformed the world, but their responsible use is essential for a sustainable future.



# ARTICLES

## Electric cars

Electric cars have become increasingly popular in recent years as people have become more aware of the impact of carbon emissions on the environment. These vehicles use electricity as their primary source of power instead of gasoline or diesel, which makes them much more eco-friendly. In this essay, we will explore the advantages and disadvantages of electric cars and their impact on the environment. One of the biggest advantages of electric cars is that they are environmentally friendly. Unlike traditional cars that emit harmful gases into the atmosphere, electric cars emit zero emissions. This means that they do not contribute to air pollution or climate change. This is a significant advantage for the environment, and it's one of the reasons why more people are choosing to drive electric cars.

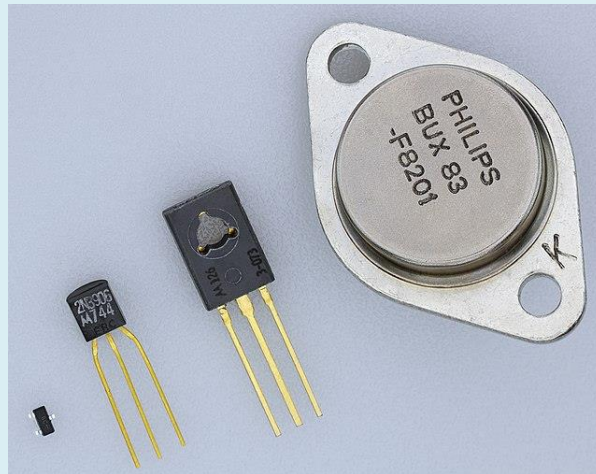
Another advantage of electric cars is that they are cheaper to maintain. Electric cars have fewer moving parts than traditional cars, which means they require less maintenance. They also don't need oil changes, spark plugs, or timing belts, which further reduces the cost of ownership. In addition, electric cars have regenerative braking systems that allow them to recover energy when the brakes are applied. This means that they have longer brake life and require less brake maintenance. Electric cars are also very efficient. Electric motors convert up to 90% of the energy from their batteries into motion, compared to just 20% for traditional cars. This means that electric cars can travel further on a single charge, which reduces the need for frequent charging. This is a significant advantage for people who want to travel long distances without having to stop and recharge their vehicle. However, there are also some disadvantages to electric cars. The most significant disadvantage is that they have a limited range. Most electric cars can only travel between 100-300 miles on a single charge, depending on the model. This means that they are not ideal for long-distance travel, and drivers need to plan their trips carefully to ensure they don't run out of power. Another disadvantage of electric cars is that they are more expensive to purchase than traditional cars. The cost of an electric car is typically higher than a gas-powered car, although this cost is offset by the savings on fuel and maintenance. Additionally, electric cars require a charging station, which can be costly to install at home. However, as electric cars become more popular, the cost of charging stations is likely to decrease. In conclusion, electric cars have many advantages, including being environmentally friendly, cheap to maintain, and efficient. However, they also have some disadvantages, such as limited range and higher purchase costs. Despite these drawbacks, more and more people are choosing to drive electric cars, and they are becoming an increasingly common sight on the roads. With continued

innovation and investment in the electric car industry, we can expect to see even more significant improvements in the coming years.

**Dilraj Singh**

## **Power Transistor**

A power transistor is a type of transistor designed to handle high-power loads in electronic circuits. It is typically used in applications where a large amount of current or voltage needs to be controlled, such as in power amplifiers, voltage regulators, and motor control circuits. Power transistors are constructed with larger and more robust semiconductor materials than small-signal transistors, which are designed for low-power applications. They can be made of various materials, including silicon, gallium arsenide, and silicon carbide, and are available in a range of configurations, such as bipolar junction transistors (BJTs), metal-oxide-semiconductor field-effect transistors (MOSFETs), and insulated-gate bipolar transistors (IGBTs).



Power transistors have a higher power dissipation rating and can handle higher currents than small-signal transistors. They also have a larger physical size and require specialized heat sinks to dissipate the heat generated during operation. Overall, power transistors play an important role in power electronics and are widely used in various applications, including power supplies, electric vehicles, renewable energy systems, and industrial automation.

**Harmanjot Kaur**

# Supporting Structures for Power Lines

The basic components of power lines are towers (pylons, poles), conductors and insulation. Towers are constructed so as to enable the routing of service conductors by which electricity is transmitted, with adequate insulation distances from objects in the vicinity of the lines and from the tower structures themselves. The dimensions and type of transmission towers depend on many factors, including the rated voltage of the power line, the location of the structure and the role it is to play in the line. All types of transmission towers are manufactured according to standards that guarantee safety of use and durability.

## **Size of transmission towers for high voltage lines 110 kV and above**

The different types of transmission towers are designed according to the voltage at which the line operates. The higher the voltage, the greater the distances to be maintained between the wires in the power line and the ground and the tower structures themselves. This results in higher voltage line towers being taller and wider than the ones for lower voltages.

- Single-circuit towers - on which are hung three phase wires making up one AC circuit and one or two lightning wires,
- Double-circuit towers - on which six phase conductors (two circuits) and one or two lightning wires are suspended,
- Multi-circuit towers - all structures that can accommodate more than two circuits.

## **Transmission towers - Types of support structures**

Transmission towers are also differentiated according to the role they are to play in the line. Several criteria are considered here, the most general of which includes two types of support structure – suspension (pass-through) and section support.

- Suspension (pass-through) structures - as defined in the currently applicable standard (PN-EN 50341-1:2013-03 "Alternating current overhead power lines above 1 kV. Part 1: General requirements. Common specifications") are structures fitted with suspension insulator strings. However, this definition does not explain much. The one contained in the withdrawn Polish Norm(PN-E-05100-1:1998 "Overhead power lines. Design and

construction. Alternating current lines with bare conductors"), which states that these are poles designed to support conductors without taking up their tension.

The basic type of such structures are suspension towers. They are usually used on straight sections of overhead lines where the route does not change its course by more than 2 degrees. In this location, the suspension towers are used to support the cables and therefore mainly carry vertical loads, but not the higher forces caused by cable tension. The use of suspension structures at the positions where the line changes direction results in loads in them with the resultant force from the tension of the cables in the direction of the bisector of the break angle. Such loads can be significant and increase strongly as the angle increases. Such a positioning of the structure requires its appropriate design and it is then customarily referred to as an angle tower.

The loads on suspension towers are strongly related to the length of the span (distance between poles in a straight line) that the tower separates, which is why different types of suspension towers are designed for structural optimisation, depending on the span length (each type assumes a maximum length of span between which the tower can be set).

Dead-end (section) support structures - PN-EN 50341-1:2013-03 standard gives an enigmatic definition of these, talking about structures equipped with tension insulator strings. The PN-E-05100-1:1998, however, explains their function in the line as structures intended to take up the tension of the conductors. The basic types of these structures are sturdy towers. These towers are used on the straight route (to limit the length of the line section) or at the bend of the line (to absorb the resultant force from the tension of the wires). The shape and design of the dead-end (section) tower depends on the line bend angle. An acceptable range of bend angles is specified for a given tower type.

In practice, many types of suspension and dead-end (section) structures are used on a given line to form what is known as a series of towers. The basic types of transmission towers used on the line are the suspension and dead-end towers mentioned above. In addition to these, there are other, less common, types of towers.

- Long-span towers - found in the case of very long spans, mainly at crossings with large rivers, where it is necessary to design very high structures (the height of a transmission tower for a 400 kV line often reaches over 100 m).

- Termination towers - suitable for carrying loads when cables are suspended from one side only. They are mostly used at the ends of lines before substations, and the wires are brought down from them to the substation structure.
- Switch towers - are a sub-type of termination tower, except that in their case there is a transition from an overhead line to an underground cable line. Fittings are mounted on the towers to connect the overhead wires to the cables. These towers are used when there is a need to run cable to a substation or when a section of line needs to be buried, for example when land is freed up for development.
- Branch towers - a fairly rare type, used at branch points of circuits. Depending on their function, they combine features of different types of transmission towers.

### **Location of overhead lines**

The design of the transmission towers is largely determined by the location of the projected line. Depending on its location, the climatic loads to be taken into account are determined on the basis of the relevant standards. These loads determine not only the required strength of the transmission towers, but also their sizes. It is necessary to take into account the behaviour of the wires under wind and/or ice loads. The type of the terrain across which the line runs is also important. Where lines run through woodland, additional types of structure are usually designed to reduce the necessary felling. In terms of operating conditions, they are mostly equivalent to the basic towers, but have a different geometry - the aim of these towers is to either reduce the width of the line (so-called forest poles) or to run the wires over the forest (so-called over-forest poles). Similarly, for 110 kV lines, so-called slim towers are often used in urban areas. They are also equivalent to basic towers, but their footprint is significantly smaller. At the cost of greater construction weight, this reduces the area occupied.

**Irfan Ahmad Malik**



# **PUBG**

## **Mobile Game Addiction**

PUBG is a term you must have probably heard by now. It is the abbreviated form of Player Unknown's Battleground. Basically, it is a video game which is a multiplayer battle royale game. It is very famous all over the world. However, the entertainment factor does not mean it is all good. The game has become viral and is played by billions of people. The players have become addicted to this game. Moreover, it is hampering their quality of life. Impact of PUBG Mobile Game Addiction When the game got released for Windows, it received rave reviews. Further, upon being released on mobile phones, it caught like wildfire. The craze for this game spread amongst all the age groups. What started as a recreation game has now turned into an addiction. It is severely impacting the lives of the players and also resulting in various crimes. For instance, a boy killed himself due to PUBG mobile game addiction. The game interferes greatly with the studies of a person. The students who should be studying waste their time on this game. This results in neglecting studies and also in reduced levels of concentration. It is so because this PUBG mobile game addiction slows down their brain activity. Their ability to grasp things and focus just lowers. Even research suggests that the academic performance of PUBG players is dropping massively. Similarly, the people who are working are also addicted to this game. It hampers their work and makes them lose the target of their goals. They are busy playing it instead of focusing on their careers. Even more, than the players take leaves or skip meetings just to play it endlessly. Due to this addiction, they also miss their deadlines and don't fulfill their duties. Furthermore, PUBG mobile game addiction ruins the relationships of people. It has even done so as there have been cases of breakups and divorces due to this game. People spend all their time on this time instead of with their family and friends. It strains Their relationships and causes pain. Similarly, it has also resulted in many crime of murder and suicide. How to Control PUBG Mobile Game Addiction? We all know that excess of anything is bad, be it a video game or anything. However, one must also know that we can control any addiction by proper measures. To begin with, try to lessen the Time you spend on the game. Leaving it all of a sudden is impractical so set aside a fixed time and try to play it in that specific one. Similarly, try to divert your mind. Do not always stay indoors. Go out and indulge in

physical activities. When you will have Other things to do, your mind won't go towards the game. So, meet your friends and take up other hobbies. Moreover, try to spend time with your family instead of scrolling through the phone or playing your game. When you will be surrounded by your loved ones, you will not care about anything else. So, utilize your time carefully instead of playing PUBG.

**ARSHDEEP SINGH**

## **EDUCATION / MASS PRODUCTION**

Mankind has gone through a lot of advancements since the time it came into existence. The same can be said about the education system i.e. the journey from gurukuls to modern day schools or colleges. The purpose of education is to empower the person in as many ways possible. But the scenario nowadays is in total contrast. Much of the graduates completing their degree are unemployable. For ex- Every year 15 lakh engineering graduates pass out in overall country. More than half of them can't be employed in their respective fields as they lack the present day technological skills required by the employers. It gives us the idea that engineers are mass produced like some equipment made in a factory but they lack the skillset. What might be the possible reasons behind this adverse condition? The marks driven education system of ours has given too much importance to marks rather than skills. It encourages mugging up topics rather than understanding and application of the same. Cheating in exams is also an outcome due to this lag in our present day education system as students want to score marks in any means possible. Due to this students may get passed in their exams but they lack the knowledge. In most of the universities the syllabus taught is an old one i.e. unchanged from 15-20 years. This results in unnecessary learning of some old concepts or theories which are not in present day use and missing out certain latest technologies. Emphasis on practical knowledge is very less and more importance is given to mugging up theories and principles in the curriculum. What is the Solution? The employers and the institutions must have to work together to make changes to the curriculum in order to meet the needs of the industries. New methods of teaching should be

employed in this era of internet. Professionals or experienced engineers from the industry could share their real time experience and knowledge with the students. More and more attention should be given to the practical knowledge. Unnecessary assignments must be done away with. The students must be encouraged to do more and more internships or technical courses. Some of the technical courses could be taught in their college itself. Innovation friendly environment should be created in the colleges. Importance should be given to solve the current day problems through the use of technical knowledge. In order to improve overall learning experience eLearning content must be made available which is frequently updated by industry professionals instead of using static textbooks. In this way rich content would be made available to the students. Blended learning should be introduced where both physical and online sessions of teaching could be done. Teachers should be trained to deliver online classes which would result in availability of trained teachers within the reach of large number of students. All-round development of the students must be given importance along with the curricular activities. It is time where we choose a learning-centric system rather than examination or assessment centric system so that the learners are allowed to select subjects based on their interests and pursue it to completion which in return would definitely turn the tides and would result in the rise of employability.

**NARESH KUMAR**

## **Smooth-talking AI assistants**

New techniques that capture semantic relationships between words are making machines better at understanding natural language. We're used to AI assistants—Alexa playing music in the living room, Siri setting alarms on your phone—but they haven't really lived up to their alleged smarts. They were supposed to have simplify our lives, but they've barely made a dent. They recognize only a narrow range of directives and are easily tripped up by deviations. But some recent advances are about to expand your digital assistant's repertoire. In June 2018, researchers at OpenAI developed a technique that trains an AI on unlabeled text to avoid the expense and

time of categorizing and tagging all the data manually. A few months later, a team at Google unveiled a system called BERT that learned how to predict missing words by studying millions of sentences. In a multiple - choice test, it did as well as humans at filling in gaps. These improvements, coupled with better speech synthesis, are letting us move from giving AI assistants simple commands to having conversations with them. They'll be able to deal with daily minutiae like taking meeting notes, finding information, or shopping online. Some are already here. Google Duplex, the eerily human-like upgrade of Google Assistant can pick up your calls to screen for spammers and telemarketers. It can also make calls for you to schedule restaurant reservations or salon appointments. In China , consumers are getting used to Alibaba's AliMe which coordinates package deliveries over the phone and haggles about the price of goods over chat. But while AI programs have gotten better at figuring out what you want , they still can't understand a sentence. Lines are scripted or generated statistically, reflecting how hard it is to imbue machines with true language understanding. Once we cross that hurdle, we'll see yet another evolution, perhaps from logistics coordinator to babysitter, teacher — or even friend.

**LOVNISH SHARMA**



## Riddles

1. What goes up and down stairs without moving?
2. Give it food and it will live; give it water and it will die.
3. What can you catch but not throw?
4. I run, yet I have no legs. What am I?
5. Take one out and scratch my head, I am now black but once was red.
6. Remove the outside, cook the inside, eat the outside, throw away the inside.
7. What goes around the world and stays in a corner?
8. What gets wetter the more it dries?
9. The more there is, the less you see.
10. They come at night without being called and are lost in the day without being stolen.
11. What kind of room has no windows or doors?
12. I have holes on the top and bottom. I have holes on my left and on my right. And I have holes in the middle, yet I still hold water. What am I?
13. I look at you, you look at me, I raise my right, you raise your left. What is this object?
14. It has no top or bottom but it can hold flesh, bones, and blood all at the same time. What is this object?
15. The more you take the more you leave behind.
16. Light as a feather, there is nothing in it; the strongest man can't hold it for much more than a minute.
17. As I walked along the path I saw something with four fingers and one thumb, but it was not flesh, fish, bone, or fowl.
18. What can run but never walks, has a mouth but never talks, has a head but never weeps, has a bed but never sleeps?
19. I went into the woods and got it, I sat down to seek it, I brought it home with me because I couldn't find it.
20. What can fill a room but takes up no space?

### Answers 1-20

Carpet, Fire, A cold, A nose, A match, Corn, A stamp, Towel, Darkness, Stars, A mushroom, A sponge, A mirror, A ring, Footsteps, Breath, Glove, River, Splinter, Light

# BHAI GURDAS INSTITUTE OF ENGINEERING & TECHNOLOGY

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