



RAJ KUMAR GOEL INSTITUTE OF TECHNOLOGY

5KM Stone Delhi-Meerut Road, near Raj Nagar Extension, Ghaziabad (U.P) 201003



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WELCOME NEW FACULTY MEMBERS



Mr. Deepak Kumar
Assistant Professor

Mr. Deepak Kumar is presently working as Assistant Professor in RKGIT, Ghaziabad. He is pursuing Ph.D in Instrumentation and Control from Dr. B.R. Ambedkar National Institute of Technology, Jalandhar, Punjab. He has done his M.E. from NITTTR, Chandigarh. He completed his B.Tech from U.P. Technical University, Lucknow .He has total teaching experience of 17 years in various engineering colleges of Uttar Pradesh and Uttarakhand. He has published 7 research papers in international Journals and conferences. His research area is control system.

Priyanka Tyagi, PhD* is presently working as Assistant professor in the Dept. of Electronics and Communication Engineering at RKGIT, Ghaziabad. She has submitted her research thesis in field of Nanoelectronics from Dr. A.P.J Abdul Kamal University, Lucknow. She holds 8 years of teaching and research experience in reputed Institutions. She has obtained her Master's degree (with Honours) in VLSI design in year 2011 and Bachelor's Degree BE (with Honours) in Electronics Engineering in year 2007.

Her area of interest focuses on Nanoelectronics, CNTFET, CNTFET ADDER, FinFET and Low power VLSI Design. She has also published more than 8 Research papers in SCIE, Scopus and various national & international journals.



Ms. Priyanka Tyagi
Assistant Professor

INDUSTRIAL VISIT TO AUTOMATION ENGINEERS AB PVT LTD

The Electronics and Communication Department of Raj Kumar Goel Institute of Technology, Ghaziabad organized a one-day Industrial visit to AUTOMATION ENGINEERS A.B. PVT. LTD., NOIDA on 5th July 2022 for 2nd year students of ECE department. The visit was organized with prior permission and guidance of Respected HOD **Dr. R.K. Yadav**.

The main objective behind the visit was to make students aware of how various activities like designing, assembling, cost management are carried out in the company.

The industrial visit was witnessed by 25 students, who were accompanied by the Faculty

Mr. Sandeep Bhatia (A.P, ECE)

Mr. Sachin Tyagi (A.P, ECE)

Automation Engineers A. B. Pvt. Ltd. is a Company run and managed by professionals, renowned in the Automation industry in their respective areas of expertise. The average experience of the key personnel is more than 25 years. AEAB has been serving the industry for almost the last two decades. Namely, the solution offered covers the application of PLC, DCS, Electrical Drives, MCC, PCC, and Instrumentation.

The overall experience of visit was very fruitful for students and the students requested to arrange more such industrial visits in near future.





2nd International Conference on Advancement in Electronics and Communication Engineering

AECE-2022

AECE 2022 was organized by the Department of Electronics and Communication Engineering on 14th -15th July 2022. This conference was sponsored by AICTE and the proceedings of the conference were published by collaboration with SSRN (Elsevier).

AECE-2022 was 2nd International conference addressing advances in all AI, IoT& Antennas, Communication and Signal Processing including theory, tools, applications, systems, test-beds and field deployments. The conference focused on the core science to develop fundamental principles that underpin the integration of cyber and physical elements, as well as on the development of technologies, tools, architectures and infrastructure for building AI, IoT & communication systems, highlighting the design, implementation, and investigation of communication applications. The scope of (AECE-2022) was to provide an international forum to promote, enhance and stimulate international research interactions and collaboration in the fields of Computer Science, Electronics, Electrical, Healthcare and Information Technology.

AECE 2022 also included plenary talks from by Professors from renowned Institutions like IIT Delhi, IIT Patna, Dambi Dollo University, DTU etc. More than 300 Research Papers were received from all around the globe, countries like Canada, USA, Russia, Ethiopia etc . After the review process around 145 papers were presented and published.

The Convener of the Conference was Dr. RK Yadav, Co- Convener, Ms. Richa Gupta and Organizing Secretary was Mr. Kunal Lala.







आरकेजीआईटी में दो दिवसीय एआईसीटी स्पॉन्सर्ड इंटरनेशनल कॉन्फ्रेंस का आयोजन

हिन्द आत्मा संवाददाता

गाजियाबाद। आरकेजीआईटी में दो दिवसीय एआईसीटी स्पॉन्सर्ड इंटरनेशनल कॉन्फ्रेंस एडवॉन्समेंट इन इलेक्ट्रॉनिक्स एंड कम्युनिकेशन इंजीनियरिंग का आयोजन 14 एवं 15 जुलाई को हुआ था। 15 जुलाई को इसका सफलतापूर्वक समापन किया गया। दो दिवसीय इस संगोष्ठी में 80 से अधिक प्रतिभागियों ने अपने शोध पेपर प्रस्तुत किए। प्रोफेसर प्रियंका जैन (दिल्ली टेक्नोलॉजिकल यूनिवर्सिटी) ने ब्रेस्ट कैंसर के विषय में चल रही रिसर्च से अवगत कराया। कार्यक्रम के विशिष्ट अतिथि रहे एमके सेठ ने सभी प्रतिभागियों का उत्साहवर्धन किया।

कार्यक्रम में सर्वोत्तम रिसर्च पेपर का अवार्ड (टाइटल- रिच्यु ऑन विर्येबल माइक्रोस्ट्रिप एंटीना) डॉ नवनीत शर्मा, हिमानी गर्ग, अंशिका अग्रवाल, आद्रिका गुप्ता, अनिरुद्ध जोशी, अंजलि पाल को मिला। कार्यक्रम में डॉ लक्ष्मण प्रसाद, डॉ डीके चौहान, डॉ डीआर सोमशेकर,



एचजी गर्ग आदि मौजूद रहे। कार्यक्रम का सफल आयोजन डीन ईआईआई डॉ पुनीत चंद श्रीवास्तव के नेतृत्व में किया गया। कार्यक्रम की को-कन्वीनर ऋचा गुप्ता एवं कार्यक्रम के आयोजन सचिव कुणाल लाला ने की भी कार्यक्रम में महती भूमिका रही इस संगोष्ठी के सफल आयोजन के लिए संस्था के वाइस चेयरमैन अक्षत गोयल ने डॉ आरके यादव कन्वीनर (एआईसीटी-2022) एवं डिपार्टमेंट की सभी फैकल्टी मेंबर्स को बधाई दी।



अंतरराष्ट्रीय संगोष्ठी के अंतिम दिन प्रस्तुत किए 80 शोधपत्र

माई सिटी रिपोर्टर

गाजियाबाद। मेरठ रोड स्थित आरकेजीआईटी कॉलेज में इलेक्ट्रॉनिक्स एंड कम्युनिकेशन विभाग की ओर से आयोजित दो दिवसीय अंतरराष्ट्रीय संगोष्ठी का शुक्रवार को समापन हो गया। संगोष्ठी के आखिरी दिन देशभर के कॉलेजों और विश्वविद्यालयों से आए 80 से अधिक प्रतिभागियों ने अपने शोध पत्र प्रस्तुत किए। दिल्ली टेक्निकल यूनिवर्सिटी की प्रो. प्रियंका जैन ने अपनी ब्रेस्ट कैंसर पर चल रहे शोध से अवगत कराया। संगोष्ठी में सर्वोत्तम शोध पेपर का पुरस्कार रिच्यु ऑन विर्येबल माइक्रोस्ट्रिप एंटीना को प्रस्तुत करने वाले डॉ. नवनीत शर्मा, हिमानी गर्ग, अंशिका अग्रवाल, आद्रिका गुप्ता, अनिरुद्ध जोशी व अंजलि पाल को मिला। कार्यक्रम संस्थान के वाइस चेयरमैन अक्षत गोयल, विशिष्ट अतिथि एमके सेठ ने प्रतिभागियों का उत्साहवर्धन

आरकेजीआईटी में दो दिवसीय संगोष्ठी का हुआ समापन



आरकेजीआईटी में आयोजित संगोष्ठी में छात्र-छात्राएं। संवाद

किया। कार्यक्रम में डॉ. लक्ष्मण प्रसाद, डॉ. डीके चौहान और निदेशक डॉ. डीआर सोमशेकर व एचजी गर्ग ने तकनीकी क्षेत्र में शोध के महत्व पर प्रकाश डाला। इस मौके पर डीन डॉ. पुनीत चंद श्रीवास्तव मौजूद रहे।

FACULTY PUBLICATIONS

| S.No. | Name Of Faculty | Title Of Paper | SCI/Scopus | Journals/Conferences | Name Of Journal/Conference | Month/Year |
|-------|--------------------|---|--------------------------|----------------------|------------------------------|------------|
| 1 | Dr. R K Yadav | Pearson's Correlation And Background Subtraction (Bgs) Based Approach For Object's Motion Detection In Infrared Video Frame Sequences | SCI | Journals | Springer, Statistical Papers | June 2022 |
| 2 | Dr. R K Yadav | Smart Mirror Using Raspberry pi | Elsevier | Conference | AECE | July 2022 |
| 3 | Dr. R K Yadav | Detecting And Classifying Vehicles Under Uncontrolled Environmental Conditions: A Transfer Learning Based Approach | Elsevier | Conference | AECE | July 2022 |
| 4 | Dr. R K Yadav | A Review On Detection Of Human Emotions Using Colored And Infrared Images | Elsevier | Conference | AECE | July 2022 |
| 5 | Dr. R K Yadav | Low Profile And Wideband Antennas For Iot Application | Elsevier | Conference | AECE | July2022 |
| 6 | Dr. R K Yadav | Single Input Based Cnn- Lstm And Cnn-Gru Based Har Using Wearable Sensors | Elsevier | Conference | AECE | July2022 |
| 7 | Dr. R K Yadav | High-Isolation Ebg Based C-Band Mimo Antenna For Radar Application | Elsevier | Conference | AECE | July2022 |
| 8 | Dr. Himani Mittal | Selfie Mask Smart Atm Vending Machine" | Elsevier | Conference | AECE | July2022 |
| 9 | Dr. Himani Mittal | Execution Of High-Performance Low Power Dual Edge Triggered Flip Flop | Elsevier | Conference | AECE | July 2022 |
| 10 | Dr. Neha Goel | Dual Axis Solar Tracker With Smart Irrigation System | Elsevier | Conference | AECE | July2022 |
| 11 | Dr. Neha Goel | Modelling For Reducing Short Channel Effect In 3d Fully Depleted Mosfet (Soi) With Gate Bias (Back) | Elsevier | Conference | AECE | July2022 |
| 12 | Ms. Hashmat Usmani | Iot Based Early Flood Detection And Avoidance | Elsevier | Conference | AECE | July2022 |
| 13 | Ms. Hashmat Usmani | Secure Entry Door Automation | Elsevier | Conference | AECE | July2022 |

FACULTY TECHNICAL CORNER

Carbon Nanotubes Just Might Rock the World in 9 Ways

Nanotubes can be envisioned as one-atom thick sheets of carbon that have been rolled into tubes. Researchers know that when things get that small, they act a little weird, and labs around the world are now racing to capitalize on **nanotubes'** strange properties. With their extraordinary strength and fascinating knack for conducting electricity and heat, nanotubes are finding applications in everything from cancer treatments to hydrogen cars. These structures of carbon may be tiny—a nanotube's diameter is about 10,000 times smaller than a human hair—but their impact on science and technology has been enormous.

Here, we count down nine of the most enticing possibilities for these giants on the Lilliputian stage. They probably won't all pan out, but if nanotubes fulfill just a few of these predictions, they'll be worth the buzz.

9. X-traordinary X-rays A new nanotube-based imaging system could take sharper, faster pictures that trump today's X-rays and CT scans. Researchers from the University of North Carolina say their device will be especially useful for imaging organs that are perpetually in motion, like the heart and lungs.

In a traditional X-ray machine, a filament emits electrons when it is heated above a certain threshold, and those electrons fly through the body and hit a metal electrode on the other side, creating images; CT scans produce three-dimensional images by rotating the electron source. But **the new system** uses an array of carbon nanotubes that emit hundreds of electrons simultaneously as soon as voltage is applied to them. The system is faster than a regular X-ray machine because there are no filaments to warm up, and the multiple nanotube emitters can also take pictures from many different angles without moving.

8. Helping the Hydrogen Car Cars powered by hydrogen fuel cells have been a clean energy dream for years, but they've been held back largely by the expense of making fuel cells. The Department of Energy estimates that half of a fuel cell's price tag comes from the platinum catalyst used to speed up the reaction that produces energy. But in February a team of researchers found that bundles of carbon nanotubes doped with nitrogen form a **more efficient and more compact catalyst**.

While carbon nanotubes are currently fairly expensive to produce, researchers note that the price has been plummeting. Researchers from the University of Dayton, Ohio note that nanotube production costs have fallen 100-fold since 1990, while no such price reductions are likely with platinum, a limited natural resource.

7. Diagnosis Via Nanotube Spanish researchers say nanotubes can even help with an embarrassing medical problem, and have **created a biosensor** that can diagnose yeast infections (the irritating fungal infections that can take hold on the genitals). The scientists say their gadget provides a quicker diagnosis than today's typical method, in which a cell sample is taken and cultured in the lab to look for the presence of the *Candida albicans* fungus.

The researchers built a transistor that contains carbon nanotubes and antibodies programmed to attack the *Candida* yeast cells. When a cell sample is put on the biosensor, the interaction between the yeast and the antibodies changes the electric current of the device. The extremely conductive nanotubes record the change and allow researchers to measure how much yeast is present.

6. The Smallest Chips in the Land Nanotubes could even spell the end of a building block of our modern world: the silicon-based computer chip. Several research groups have found ways to "unzip" carbon nanotubes to produce **atom-thick ribbons of graphene**. Like silicon, graphene is a semiconductor, but the nano-sized ribbons could be used to pack much more processing power on every computer chip.

Researchers have made graphene ribbons before, but never as easily—previously the ribbons were cut from larger graphene sheets, which offered little control over their size and shape. In contrast, unzipping nanotubes is a precise process. One research group first stuck the nanotubes to a polymer film, then used argon gas to etch away a strip from each tube to produce the nanoribbons.

5. Turn It Up! The next application could make for a noisier world: Chinese researchers have found a way to make flexible, **paper-thin loudspeakers** out of nanotube sheets. The scientists say the technology could be used to add an auditory dimension to anything from clothing to magazines—and to prove their point, they put one on a waving flag.

The nanospeakers don't generate sound like conventional speakers, which make noise by vibrating the surrounding air molecules. Instead, they harness a phenomenon called the thermoacoustic effect, which is how lightning produces thunder. When an electric current runs through the nanotube sheets, they heat and expand the air near them, creating sound waves.

4. Taking Lessons from the Gecko Real-world Spidermen could one day scamper up walls thanks to an **adhesive made of carbon nanotubes**. The substance mimics the design of gecko feet, which are covered in millions of tiny hairs that each end in a profusion of spatula-shaped tips. The lizards can defy gravity and walk up sheer surfaces because when those tiny tips are close to a surface, they induce a strong attractive force that operates on the atomic scale, known as the **van der Waals force**.

The nanotech version of this system is a glue that is ten times stickier than the gecko's feet. Researchers made arrays of vertically aligned nanotubes that were topped with shorter nanotube bits, like branching treetops. The adhesive worked on a variety of surfaces, including slick glass and rough sandpaper, but its hold could easily be broken by those who knew the trick. Just like a gecko lifting its foot away from the wall, researchers pulled the glue pad away at a 90-degree angle so that only the tips of the branching nanotube bits were touching the surface, and it easily came away.

3. Flexible, Bendable Electronics Imagine a **computer screen that could be bent**, folded in half, and even crumpled like a sheet of newspaper, without affecting its function in the slightest. Researchers at the University of Tokyo took a step in that direction in May when they constructed a display made of organic light-emitting diodes (OLEDs) paired with a rubbery, nanotube-based conductor.

The organic compounds in an OLED system emit light when an electric current is passed through them, and they need no backlight, making them thinner than traditional displays. As nanotubes are natural semiconductors, they channel the electricity to the organic compounds. Researchers can envision enough technological applications to fill a World's Fair, including everything from food packages with interactive displays to artificial skin for robots and coatings for airplanes that would check the craft for wear and tear.

Low-cost, large-scale fabrication could be around the corner: The researchers used a cheap industrial printing process to deposit the nanotubes on a rubbery surface.

2. Space Elevator, Going Up Carbon nanotubes are renowned for their superior strength, and in March researchers from the University of Texas manipulated that property to **create a material** that is simultaneously strong, stretchy, and nearly as light as air. The researchers made an aerogel (a low-density solid) out of nanotubes, and found that it was as strong as steel. Meanwhile, applying voltage to the material made it stretchier than rubber.

What possible uses could the world find for such a material? One idea is to fashion nanotube ropes to act as cables for a **space elevator**, which could lift astronauts, cargo, or even tourists into orbit. The **62,000-mile-long cables** would have to be strong and flexible so they wouldn't break when buffeted by atmospheric storms and space debris, but light enough so they wouldn't collapse under their own weight.

1. Tumor Blitz The tiny tubes could even end up as must-haves in cancer hospitals one day. In a recent **study**, researchers injected carbon nanotubes into kidney tumors in mice, and then directed a near-infrared laser at the tumors. The tubes responded to the laser blast by vibrating, which created enough heat to kill surrounding tumor cells.

In the group that received the highest dose of nanotubes followed by a 30-second laser treatment, the tumors shrank and completely **disappeared in 80 percent of the mice**. The procedure didn't appear to damage the animals' internal organs, and left only a slight burn on the skin. But researchers haven't yet proven that nanotubes are safe and non-toxic, and say that much more research must be done before such procedures are ready to be tested in humans.



Ms. Priyanka Tyagi
Assistant Professor, ECE

STUDENT TECHNICAL CORNER

Neural Networks and their Applications in Regression Analysis

Introduction

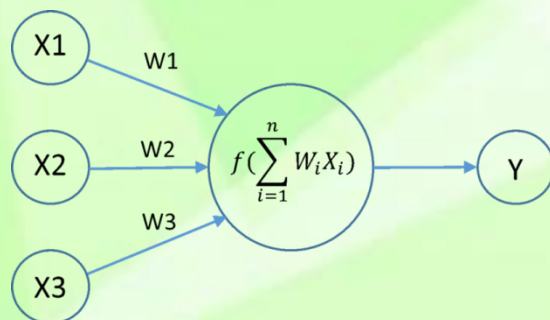
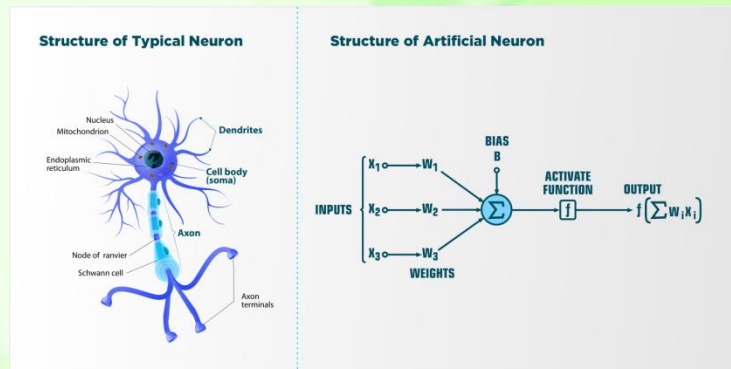
Over the past few years, Neural Networks have predominated the field of classification problems. Highly effective results have been achieved in domains of computer vision and language and speech processing after implementing deep neural networks.

“But can Deep Learning, precisely Neural Networks be deployed in place of fundamental machine learning models??”. “Are Artificial Neural Networks capable of solving problems pertaining to linear and logistic regression analysis??”

I have tried to address this question in this article and included an illustration involving implementation of Boolean logic using Neural Networks. So let’s get started.

Neural Networks — — — Revisiting Basics

Inspired from the working of Human Nervous System the idea of Artificial Neural Networks came into existent around 1960. Drawing inferences from the works of Warren McCulloch and Walter Pitts, Frank Rosenblatt put forward the idea of the fundamental Perceptron.

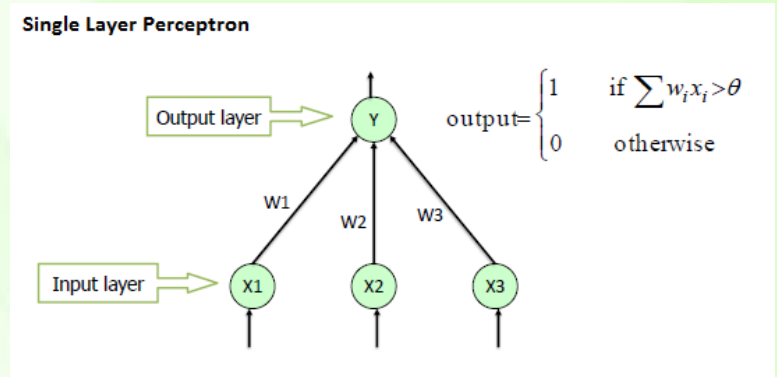


The Perceptron is the basic unit of all forms of Neural Networks,(such as Feed-Forward Neural Networks, CNN,RNN,GAN’s etc.).Let us deal with its computational working.

The basic Perceptron takes multiple binary inputs and provides a single binary output after a simple mathematical computation is involved.

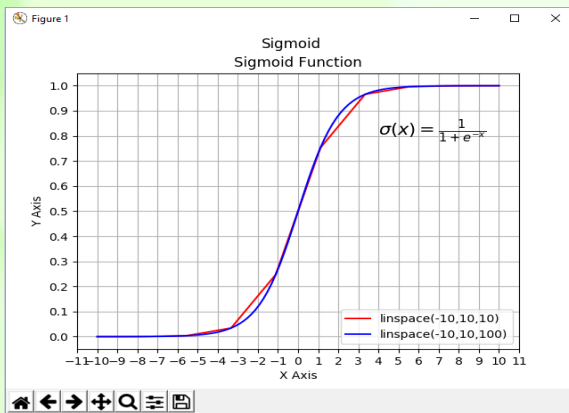
Here the inputs are X_1, X_2, X_3 . For Computational purposes Rosenblatt had provided WEIGHTS to each input. These weights were real numbers expressing the importance of the corresponding input to the concerned output.

He proposed the idea of providing a THRESHOLD to the perceptron. Thus the Perceptron took the inputs in the form of a WEIGHTED SUM ($\sum W_i X_i$) and provided a functional value of that weighted sum as its output only when the this computed functional value had crossed the threshold.



The Following image will ease the understanding.

The Threshold in this case is \ominus



The Function $f()$ as shown above is said to be the Activation Function. We Will get to see about it in our next article. But for now let us develop a brief perception regarding Activation Functions with the help of a common example. Sigmoid Activation (often deployed for binary as well as multi class classification).

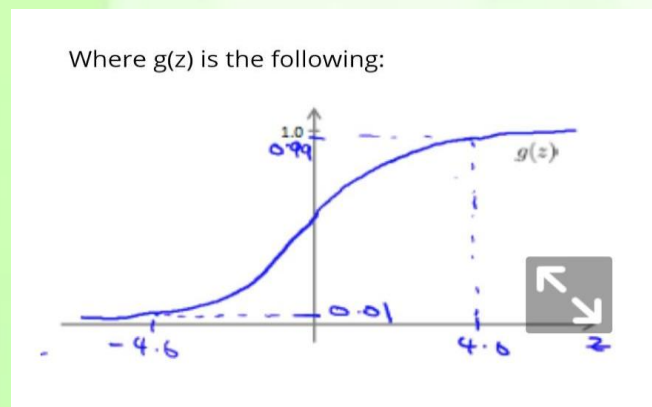
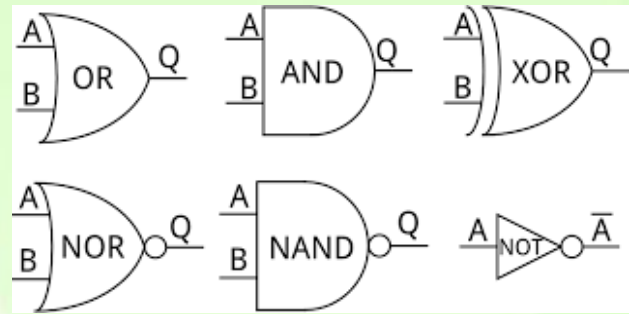
The Curve in Blue is the perfect Sigmoid Curve Sigmoid takes in an input which is a real number (might be an integer or a floating variable) and provides an output which lies between 0 and 1).

Mainly implemented at the output layer of a multi class or binary classification network.

Thus Considering the output from the neurons of the penultimate layer as an input to the last layer as X we have the output from the network in the form of its functional value $f(X)$.

Applications

We will now see how Boolean logic in the form of digital logic gates can be implemented using this concept. Let us see the intuition behind it. Now to brief about what digital logic gates are, well, these are basic circuits, which take digital signals as their input and based on a particular circuitry provide a signal at the output.

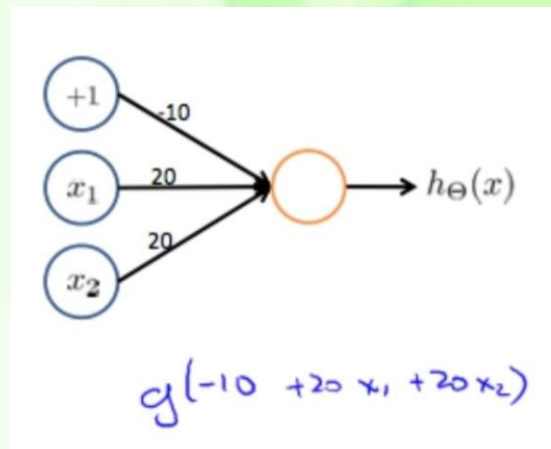


But in this case we do need to assume that Sigmoid activation function has been used at the final layer. The activation is given in the form of $g(z)$, z is the input from the penultimate layer (basically the weighted sum of the concerned).

Problem Statement: We are to implement an OR gate using Neural Networks. Let us consider the following networks with predefined weights.

Example : OR Function

We have a Neural Net without any hidden layer. The Bias Unit Is associated with a negative weight.

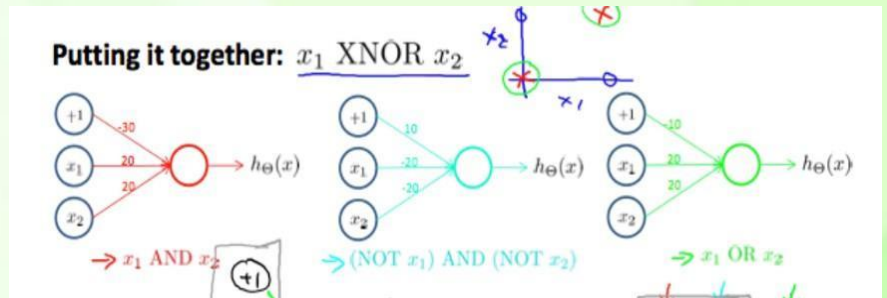


X_1 and X_2 are two random variables (Boolean in type) and can assume two values 0 and 1. As mentioned earlier $g(z)$ is the functional value of z the activation function being sigmoid.

| x_1 | x_2 | $h_{\Theta}(x)$ |
|-------|-------|--------------------|
| 0 | 0 | $g(-10) \approx 0$ |
| 0 | 1 | $g(10) \approx 1$ |
| 1 | 0 | ≈ 1 |
| 1 | 1 | ≈ 1 |

Thus let us take a look at the output. We are considering binary values for X_1 and X_2 only. As shown from the graph of sigmoid it is clear that for large values at its input the output will be 1. For smaller values (values which are essentially negative the output is supposed to be 0)

This is quite like the Truth Table of an OR gate. Similarly And Gates and XOR and XNOR gates can be computed. For XOR and XNOR gates however a hidden layer has to be implemented.



Neural Network implementing a XNOR gate



Himanshu Negi
ECE-4th Year

PLACEMENT DATA

| LIST OF PLACED STUDENTS B.TECH (ECE), 2023 - BATCH | | | | |
|--|---------------|-------------------|--------------------------|---------------|
| S. NO. | ROLL NO. | STUDENTS NAME | COMPANY NAME | PACKAGE (LPA) |
| 1 | 1900330310017 | ANUBHAV JORIA | INNOBIT SYSTEMS | 4.20 |
| 2 | 1900330310028 | HARSH ANAND | INNOBIT SYSTEMS | 4.20 |
| 3 | 1900330310029 | HIMANSHU NEGI | UNTHINKABLE SOLUTIONS | 5.00 |
| 4 | 1900330310058 | SHAILJA GHILDIYAL | APPINVENTIV TECHNOLOGIES | 3.60 - 4.20 |
| 5 | 1900330310069 | SRIKAR SUNDRAM | NAGARRO | 4.50 |
| 6 | 1900330310078 | VANSHIKA AGGARWAL | INNOBIT SYSTEMS | 4.20 |

For any Suggestion & Queries

Kindly mail us to:

udghoshece@gmail.com

ALUMNI SPEAK

It gives me great pleasure to be alumni of the institution RKGIT. The four years of graduation life has taught me so much, beyond the confines of the curriculum. Our extremely well trained and dedicated faculty not only thrive to make us technically sound but also concentrate in developing our all round personality, The faculty is very supportive in every manner and focus on student's career goal with proper guidance. Doors of opportunities are vast and momentous. The ambience of college always remains positive and thrives us towards developing our personality as a whole.

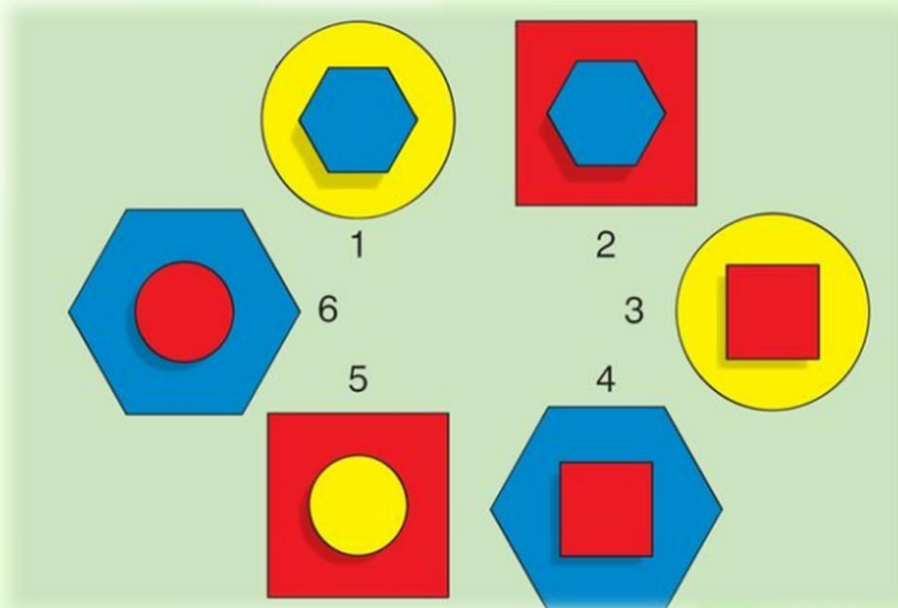
I am really thankful and feel privileged to be a part of RKGIT.



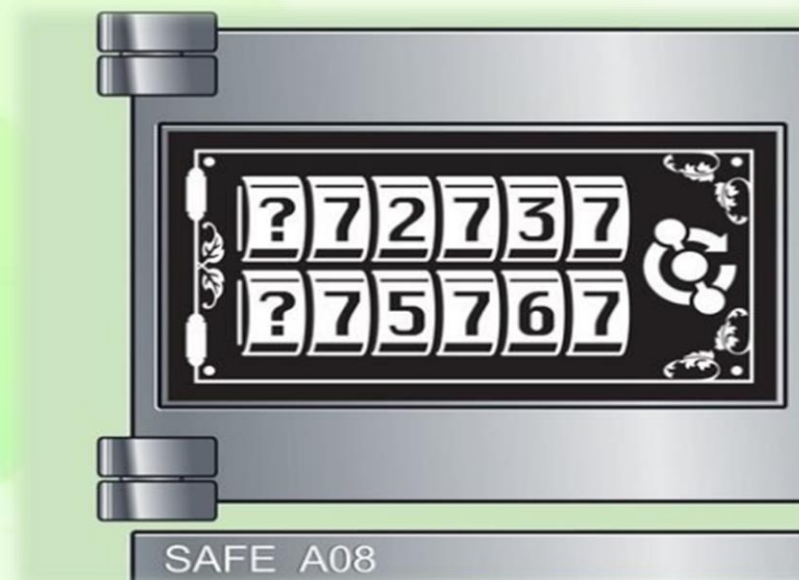
Ashutosh Prajapati
Implementation Engineer- Zenoti India Ltd.
Batch: 2018-2022

BRAIN TEASERS

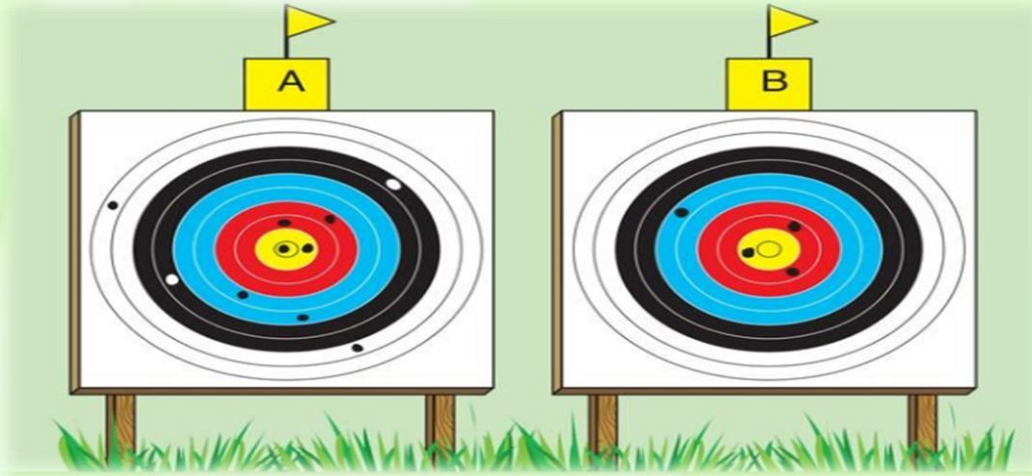
1. Which figure (1-6) is not colored correctly?



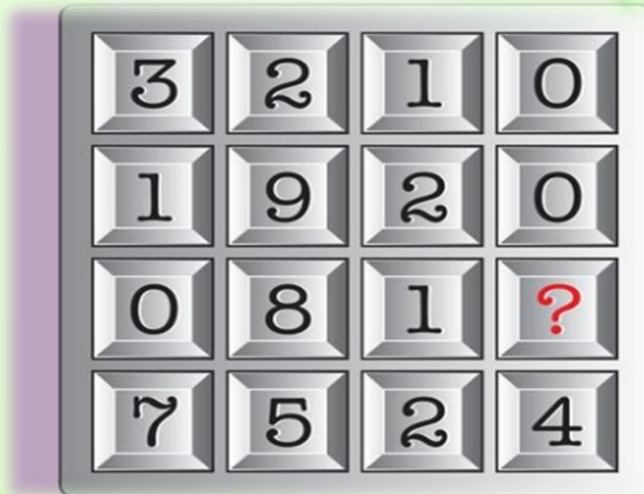
2. To open this safe, you have to replace the question marks with the correct figures. You can find this figure by determining the pattern behind the numbers shown.



3. How many points does Archer B score knowing that the total score of Archer A is 55 and that different points are earned in the ten zones in ascending value toward the center?



4. Which number should replace the question mark to form accurate equations, knowing that three numbers are shown per row (i.e. two of the numbers form a two-digit number)?



5. A line of 100 airline passengers is waiting to board a plane. They each hold a ticket to one of the 100 seats on that flight. (For convenience, let's say that the n th passenger in line has a ticket for the seat number n .) Unfortunately, the first person in line is crazy, and will ignore the seat number on their ticket, picking a random seat to occupy. All of the other passengers are quite normal, and will go to their proper seat unless it is already occupied. If it is occupied, they will then find a free seat to sit in, at random. What is the probability that the last (100th) person to board the plane will sit in their proper seat (#100)?