

SRM VALLIAMMAI ENGINEERING COLLEGE

COMPUTER SOCIETY OF INDIA

STUDENT BRANCH

MAGAZINE - 2020

VOLUME - I ISSUE - II



LimeLight



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About SRMVEC CSI-SB :

SRM Valliammai Engineering College Student Branch was started in the year 2007. For the past 13 years, SRMVEC organised various events and contributed many technical articles to CSI. It is one of the active Student Branch of CSI and since 2015 for four consecutive years, it has received “Best Accredited Student Branch Award” at every Annual CSI Convention from Computer Society of India. The student branch currently hold more than 370 Student members.

Design & Editorial Team

Mr. J. Sabarish

Final Year, CSE Department
Membership Number : 01491541
sabarish35@outlook.com

Miss. S. Sonali

Final Year, CSE Department
Membership Number : 01491545
sona.selvakumar25@gmail.com



PREFACE

It gives us great pleasure to release the second issue of 2020 'LimeLight'. The SRMVEC CSI-SB members have been enthusiastic to show their talents. This magazine gives desired opportunity and platform to publish the students' thoughts and creativity. We strongly believe that the purpose of the knowledge is fulfilled only when it is transferred to another person. In this manner this magazine would serve as a collection of knowledge. With the technology growing leaps and bounds day by day, it is very important for the people to be aware of the on-going development in the technology. We appreciate each and every hand who joined with us in this venture.

Regards
SRMVEC CSI-SB Team



TABLE OF CONTENTS

SRMVEC CSI-SB Office Bearer 2020 – 2021.....	1
Events.....	2
SRMVEC CSI-SB Team	
Industry 4.0	4
Miss. K. Snega, Miss. K. Sneha	
A glimpse on Deep Learning	8
Miss. B. Mythily	
Virtual Reality and its types	12
Miss B. Mythily, Miss. A. Lakshmi Praba	
This Thing Knows	14
Miss. M. Chandrakala	
Information technology and Internet	15
Miss. A. Lakshmi Praba	
Is Music Becoming a New Passion For Life?	15
Miss. K. Snega	
Magic square	16
Miss. M. Chandrakala	
Word Fun.....	27



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EVENTS

Webinar – Mobile Robots Fuzzy Approach (Hands on Session)

The SRM Valliammai Engineering College Computer society of India student branch in association with division IV - computer Society of India, organized a National Level Webinar on 6th of September 2020 (11.00 pm to 12.30 pm). In this pandemic time, it was a good opportunity to gain more knowledge and utilize time effectively. The webinar was about 'Mobile Robots Fuzzy Approach'. Around 150 students have registered and got benefited. The speaker was Dr. R. Uma Maheshwari, Asst. professor, EIE, SRM Valliammai Engineering College. She has specialized in the core area of soft computing techniques. She is an innovative person with deep knowledge in Artificial Intelligence, Neuro-fuzzy systems and IoT. The students got to know about the basics of fuzzy logics and mobile robots. The students got the opportunity to clear the doubts based on basic fuzzy logic and mobile robots based on fuzzy rules and everyone enjoyed the session as it was interactive and informative.



National Level Webinar Digital Marketing (Career Opportunities)

The SRM Valliammai Engineering College Computer Society of India Student Branch organized a National level webinar on Digital Marketing (Career opportunities) on 14th October, 2020 (2.30 pm to 3.30pm). More than 250 candidates registered for the programme. The resource person was Dr. B. Chidhambararajan, a passionate teacher who has always invested in innovative teaching nuances to reach out to students, Chairperson – Division IV, Computer Society of India and Principal, SRM Valliammai Engineering College. The candidates were enlightened about Digital Marketing and its role in today's world. The session was an interesting one which rent the audience interactive.



EVENTS

Sustaining Growth in the Changing Technological World

The SRM Valliammai Engineering College Computer Society of India Student Branch organized a National Level Webinar on sustaining growth in the changing technological world on 18th October, 2020 (11.00 am to 12.00 noon). More than 100 students registered for the programme. The resource person was Mr. Siva Nagarajan, Associate Manager, Accenture Solution Pvt.Ltd. The students got to know about the technologies in the current world and the way to get knowledge about it. The students got the opportunity to clear the doubts based on technology which would be our future and the effective methods to apply basic learning. The webinar was enjoyable and productive for all the students who have participated.

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11.00 am to 12.00 noon
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Shutters Stock

The SRM Valliammai Engineering College Computer Society of India Student Branch organized a competition 'Shutters Stock'. In the competition, more than 20 students participated and the registration was open till 20th October, 2020. The creativity and innovative ideas of the students were showcased in this competition. Mr. K. Elaiyaraja (Assistant Professor, Department of IT) and Mrs. R. Saranya (Assistant Professor, Department of IT) evaluated the talents based on creativity, relatedness to the topic, uniqueness and originality. The top 3 creative images were chosen and posted in SRMVEC CSISB instagram page. The first place was won by Mr.P.JAGDESHWAR whose image was captioned, 'Just forget about the surroundings'. The second and third places were bagged by Ms.LAKSHMI PRABA and Mr.SOWTHRIRAJA for their images captioned 'PANDAL FOR CORONA VICTIMS' and 'Patterns are Everywhere' respectively.

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EVENTS

Auricle

The SRM Valliammai Engineering College Computer Society of India Student Branch organized a competition 'AURICLE'. More than 180 Students registered for the competition. The registration was open till 25th November 2020. The round 1 event (quiz) was held on 27th November 2020. The round 2 participants were around 10 and the event (Tech talk) was held on 29th November 2020. In the first round the participants were evaluated based on their MCQ score. In round 2, Mrs .S. Shenbagavadivu (Assistant professor (Sr.G), Department of IT) evaluated the talent based on the time management, knowledge of the topic, clarity and fluency. The first place was won by Aravind Prabakaran and the second and third place was bagged by Rishikesh V and Jayaraj CN respectively.



Industry 4.0

Abstract

Industry 4.0 denotes the fourth industrial revolution in the field of technology. Main concept of this revolution is to make smarter machines which uses most of the things under the software systems and it is addressed via **IoT**. Industry 4.0 also refers to the smart networking of machines and helps in information gathering and communication technology. It is globally adopted and mainly evolved by the **German Manufacturing Industries**

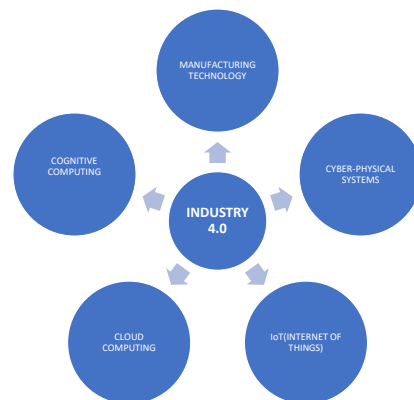


Figure 1 : Industry 4.0



Industry 4.0

Industry 4.0 has a broad vision with clear frameworks and characterized of physical industrial assets. A key role in industry 4.0 is played by IoT with its IoT stack components and form IoT platforms to industrial IoT gateways.

Introduction

Industry 4.0 is a very popular and trending topic because it plays a big role in influence on manufacturing. Today's internet application development demand is very high. Basically, IoT is a network in which all physical objects are connected to the internet through network devices or routes and exchange data. IoT allows objects to be controlled remotely and access existing network infrastructure.



Figure 2 : Business Transformation

IoT (internet of Things)

In this generation, people in the world are mostly connected with digital networks and internet via smartphones, computers laptops etc., and they share information. Hence IoT is basically a network which connect people through internet. IoT allows

, every person to share information without the need of human interaction. According to the definition of **Gartner** “ IoT is a network of physical objects that contains the technology for communication and sense with their internal states.” While IoT starts its connected things, it depends on both advantages and disadvantages which is related to the network technologies, applications built on this layer. IoT has an umbrella term for its technology service that depends on the usecase and also includes the technologies such as AI, Cloud Computing, Cyber Security, Big Data, Digital twin simulation and etc., IoT has an additional layer for storing information, for making transaction of information between the users interact with each other, all these are done using the technology. Moreover, it empowers information driven automation.

Industrial IoT (IIoT)

The main use of IIoT is to use a combination of sensors, wireless networks and analytics to measure the industrial processes. When this IIoT is introduced among individual companies, the impact of this will be greater and production is higher. The two potential aim of IIoT is :

1. Increasing workforce productivity.
2. Cost saving.

EG.

Alexa Built

Alexa serves as a major role where it is capable of voice interaction, music playback, streaming podcasts etc., it acts as a control server for automatic home



Industry 4.0

appliance system by the voice recognition . Not only Alexa but also siri (only in apple) acts the same. Both are made by the same platform of IoT.

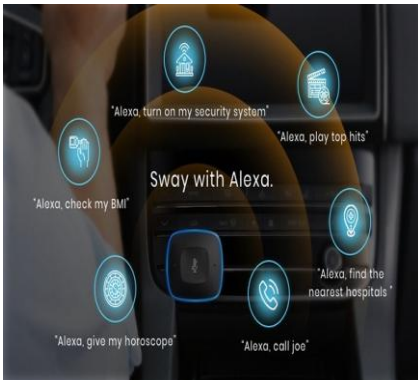


Figure 3 : Sway with Alexa



Figure 4 : Alexa

IoT Platforms

IoT platform was originated in form of middleware which acts as a mediator between hardware and application layer. The main work of this platform is to collect data from different protocols and network topologies. Modern IoT platform go further and introduce a variety of features into hardware and application layer. They provide device data processing and cloud based deployment.



Figure 5 : IoT Platforms

IoT platform plays a vital role for smart devices, vendors and startups who can use their remote control as real time functions and their interaction with smartphones and other devices. Another application for IoT is cost optimization for companies in industrial fields, agricultural fields and transportation sectors through remote monitoring devices. This platform can easily track vehicles without human and collect real time production for end to end cargo delivery tracking. Finally, IoT platform is also essential for improving customer experience in retail healthcare and travelling domains. Strategic trends for IoT platform includes Digital twins, Intelligent things, Cloud to edge etc.

Security of IoT

Security is the biggest issue in all fields of technology. In IoT, sensors collect the information which is case sensitive, it has security for its own users by providing passwords. This has been issued by UK government. A number of challenges has taken to prevent the security of IoT devices and ensuring end to end



Industry 4.0

security in environment. Another issue is that they are often resource constrain and do not contain implement strong security. As there is no guarantee that all our information is very safe while using internet so IoT provides a security platform.



Figure 6 : Security of IoT

Security measures includes :

- Incorporating security at design phase
- Hardcoded credentials
- Identity management
- Hardware security
- Application performance indicator Security (API)
- Network access control
- Patch management
- Consumer education

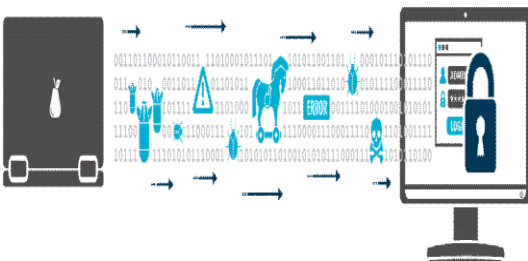


Figure 7 : Security

Advantages of IoT

IoT is more useful for GPS tracking of vehicles for transportation. It was a monitoring sensor which track distance and location accurately along with other contributing factors. The Future generation of IoT will become a great boon in business opportunities and to improve data processing and analytics. IoT saves more time when compared to other devices because it works without human interaction and also it is a low cost platform. It also protects our environment by monitoring air or water quality in the atmosphere. Before measures can easily taken by IoT. So it serves as a biggest platform.

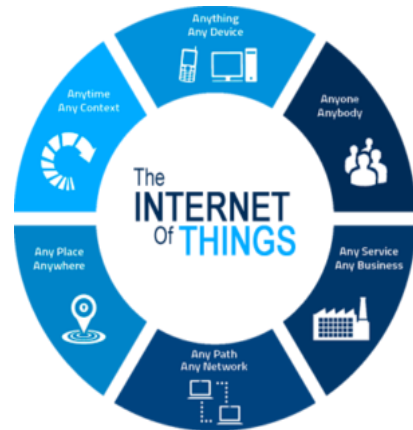


Figure 8 : IoT

Disadvantages of IoT :

In today's world there is no international standards of compatibility and monitoring equipment. Since million amount of data is transferring there is no privacy maintained and this increases the risk of losing private information.



INDUSTRY 4.0

CONCLUSION :

In span of 10 years IoT will grow more to improve 5G networks. It can easily be handled by a single cell. Many features have been increased in future and it saves more time and many advantages have developed. The flexibility of IoT technology and embedded devices make more useful in wide variety of application. As technology improves more vendors begin to complete and more refined. So IoT will surely become a huge demand in future.

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Miss. K. Snega

Second Year, CSE Department

01517809

snegak30@gmail.com



Miss. K. Sneha

Second Year, CSE Department

01517810

snegak30@gmail.com

A Glimpse on Deep Learning

Deep learning in present starts to grab the attention of modern industry and business field. Like Google buying DeepMind for 400 million dollars, Apple and its self-driving car, NVidia and it's GPU and Toyota's billion-dollar investment. Deep learning is making an impact in modern time where AI starts to survive over deep learning. It starts to make footprints over Image Processing, Drug discovery and transportation using driverless(automatic). Deep learning implemented on "Bots" starts to learn to perform classifications to

Extract Images, Sounds, Texts. But know it became a cup of coffee to review the major classifications in this "Neural Nets".

I. NEURAL NETWORKS:

The structure of a neural network is like any other kind of network; there is an interconnected web of nodes, which are called a neuron, which has edges that join them together. A neural network's main framework is to receive a set of inputs, perform progressively complex calculations,



A Glimpse on Deep Learning

that join them together. A neural network's main framework is to receive a set of inputs, perform progressively complex calculations, and then use the output to solve a problem. Most modern deep learning models are based on artificial neural networks, specifically convolutional neural networks (CNN)s, although they can also include propositional formulas or latent variables organized layer-wise in deep generative models such as the nodes in deep belief networks and deep Boltzmann machines. The term "deep" usually refers to the number of hidden layers in the neural network. Traditional neural networks only contain 2-3 hidden layers, while deep networks can have as many as 150.

A. Classifiers:

Classification is the process of categorizing a group of objects, while only using some basic data features that describe them. There are lots of classifiers available today- like Logistics Regression, Support Vector Machines, Naive Bayes. The firing of classifier, or activation as its commonly called as, procedure of a score. Neural networks are a highly structured network and comes in layers, the first layer is the input layer, the final is an output layer, and

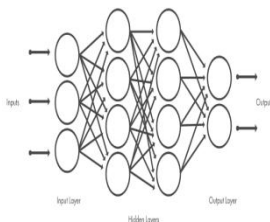


Figure 1: Neural networks

all the layers in between are hidden layer. This is because each node in the hidden layer and output layers has its own classifier.

B. Architecture:

The number of architectures and algorithms that are used in deep learning is wide and varied. LSTM and CNN are two of the oldest approaches are mostly used in various application. In past 20 years, RNN-Recursive neuron tensor nets, RBM – Restricted Boltzmann machine, CNN, Convolution nets, DBN - Deep belief nets.

1. Recurrent neural networks:

RNN, a simple structure with build in feedback loops, allowing it to act as a forecasting engine. This has its popularity now due to the works of Jürgen Schmidhuber, Alex Graves: driverless cars to speech recognition. It uses simple feed sequence of output, hence these are used in speech recognition and handwriting but RNN training for 100 steps is like training 100- layer of feed forward net this leads to exponentially small gradient and leads to a problem "Vanishing gradient". And forward method and signal flows in only one direction from input to output, one layer at a time. In a recurrent net, the output layer is added next to the input layer and fed back into the same layer, which is typically the only layer in the entire network. This changes according to the time instances, and its tough to fit for "FORWARD PROP" and uses" BACK PROP". Unlike feed forwards, this receives a sequence of inputs and it can produce a vanishing gradients



A Glimpse on Deep Learning

are eradicated using gating methods.

2. Gated Recurrent Units:

In 2014, gated recurrent units came into existence. Before Gated recurrent units, LSTM (Long Short-Term Memory) was introduced to overcome the Vanishing Gradient and short term memory loss problems found in Recurrent nets. LSTM uses selective read, selective write and selective forget; LSTM uses forget gate to retain or discard the information. But in GRU, there is no availability of forget gate, to find the information of intermediate (hidden layer) where the values are determined by the complement of the input gate. So, it works at high speed and lesser computation problems during the process to obtain information. So, they are used in natural language compression and gesture recognition. These are used in mobile selfie camera where gesture signal like waving and smiling face, clicks the picture by itself without using the shutter option.

3. Convolutional Neural Networks:

CNN is mainly used in the field of medical image processing. The usage of RELU (Rectifier linear unit) and pooling method decreases the limit of both memory and processing. Pooling is a special feature that plays a role in the dimensionality reduction of the image. The CNN layers: CONVOL, RELU, Pooling, and sets of FC frames and last with the normal RNN. For example, the convolutional algorithm is analyzed by the patterns formed in a grid

where the beam of flashlight (Filters) focused on a wall which has sliding windows are applied over each image at different resolutions and the filters will have equally weighted edges on the wall, and the output of each convoluted image serves as the input of each layer. In this way, CNN detects the complex images using 1000s of hidden layers which increases the complexity of learning the Image feature. Recent applications of CNNs and LSTMs produced image and video captioning systems in which an

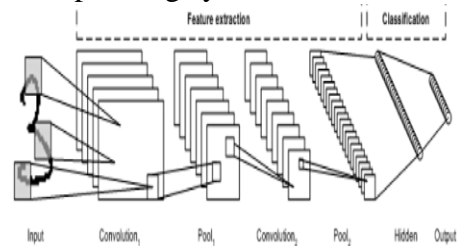


Figure 2 : Layers of Neural Network

image or video is summarized in natural language. The CNN implements the image or video processing, and the LSTM is trained to convert the CNN output into natural language.

II. Platforms:

Implementing these deep learning architectures is certainly possible, but starting from scratch can be time-consuming, and they also need time to optimize and mature. There are two ways of implementing architecture: one is platform and library. In library, there are coding languages like "H2O.io, ERSLTZ, Data Graph Lab. Whereas library platform needs coding based on Pytorch and node.js



A Glimpse on Deep Learning

opensource applications like “Theano, Caffe, TensorFlow”.

Theano allows us to build atop set of vectorized functions, providing with highly efficient, optimized solution.

Deep Learning Software Stack

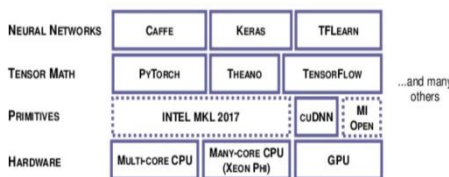


Figure 3 : Software Stack of Deep Learning

1. Caffe:

Caffe is a kind of library with machine vision or, forecasting application which build deep nets for us in sophisticated manner. These have premade nets which can be accessed by users which was developed by Google’s Yangqin Jia who won an Image net challenge in 2014. This is well suited for convolutional nets and now getting sophisticated for recurrent nets, speech recognition. These build high deep nets by configuring the hyper-parameters. This also has many sophisticated layers like vision layer, loss layer, the program libraries are built with C++ with CUDA and applications can be easily switched between MATLAB, python.

2. Theano:

Theano led to define and evaluate mathematical expressions with vectors and matrices, which are rectangular arrays of numbers. In this all technical information are converted into matrices since computer perform matrices quickly.

3. TensorFlow:

Google’s Tensor flow a commercial grade learning application Using Python. Tensor flow 1st known as DISTBELIEF which is a proprietary developed as a part of Google brain project. This became a large-scale machine learning project which can be implemented from different hardware from 100 machine to 1000 GPU. The nodes represent edges either as persistent data or math data. The data flows through these edges is a multi-dimensional array known as tensor, the output from one operation or set of operations is then fed as an input to the next. They are designed to support the domain, where computational can be modelled as data flow graph. Tensor users also worked with Keras if the flexibility is required.

III. Conclusion:

Deep learning paved way to zenith of modern world which is used from architecture for planning the sites which client in need to sketching up the complex calculation of pattern to a simplified manner using the different platforms. Now, deep learning moved to “DISTRIBUTED DEEP LEARNING” is a library that links to the leading streams of software where it connects the surface with different higher connections to build solutions to the problems



A Glimpse on Deep Learning

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Miss. B. Mythily

Third Year, ECE Department

01517743

mythnara99@gmail.com

Virtual Reality and its types

Virtual reality is completely different from real world. The simple definition is, we can imagine a world (doesn't really exist) which can be experienced through our computers. Virtual means "real" and reality means "a thing experienced by humans". It requires special headset, joystick, which completely obscures the surroundings as a result you can totally immersed in virtual world. Today virtual reality is mainly used for advance fields of medicine, education, military training and entertainment.



Figure 1 : Application of Cloud

I. History:

Virtual reality history is very much

Longer and over past five years more improvements in both hardware and software side. Virtual reality developments has experienced ebbs and flows. Basically VR companies are using AI and cloud technologies for their development. The first VR machine invented by Morton Heilig (patented in 1962) called Sensorama. In 1968 Ivan Sutherland and with his student Bob sproull invented the first VR head mounted display(HMD) called The Sword of Damocles. In 1980s the word virtual reality was popularized by John Lanier (he founded the Visual programming lab (VPL)). In 1991 Virtual reality group released virtual games and arcade machine to the public.

II.Types of Virtual Reality

VR is mainly classified into 3 major categories based on the features.

Immersive virtual reality

Non immersive virtual reality

Semi immersive virtual reality



Virtual Reality and its types

A. Immersive Virtual Reality:

Immersive meaning complete involvement in some activity or interest. The goal is to completely involve the user to computer generated world. The immersive virtual reality gives the user very realistic experience. Immersive virtual reality replaces the artificial world to user's real world.

1.Types of Immersive Virtual Reality :

- Tactical immersion - when performing when performing tactical operations with skill.
- Strategic immersion - its more associate with mental challenge.
- Narrative immersion - its totally users interest to narrate stories(similar experience while reading books)



Figure 2 : Virtual Reality (Immersive)

B. Non Immersive Virtual Reality :

As name suggest least immersive implementation. Users will



Figure 3 : Virtual Reality (Non Immersive)

interact with the environment through joystick and mouse using desktop systems. The main advantage is in non immersive virtual reality doesn't required highest level graphics performance.

C.Semi Immersive Virtual Reality :

Semi immersive virtual reality allows users to experience the three dimensional environment. Its mainly used for educational and training purposes to get more experience as real world. Semi immersive reality comprise of highly graphics computing system.

IV: recent trends:

The VR headset is an advanced version that contains head tracking or monitoring systems. Thus, it connects a computer or smartphone to send the signal and adjust the images when moved around the available space. The depth of perception helps in the formation of 3-D photos as you walk through at different angles. The monitoring system maps your movements and adjusts the environment accordingly. Each time you move your hands, legs, or head in a particular direction, the sense of perception changes. Thus, breaking the reality into something exciting and entertaining. VR headset is made using a pair of plastic with a sheet of plastic cardboard and magnifying lenses. It thus, correctly, using a smartphone screen to twist the reality. It, therefore, offers interactivity for watching 360-degree surroundings. Surprisingly, it is pretty and comfortable enough to work excellently on



Virtual Reality and its types

iOS and Android devices. The potential for data transfer speeds of up to 3 gigabits per second – by comparison, the average home broadband delivers well under 100 megabits per second – means 5G should be fast enough to stream VR and AR data from the cloud. Rather than needing to be wired up to powerful PCs, or encumbered by on-board hardware, viewing devices will upload tracking data to data centers where the heavy processing will be done. The rendered images can be delivered back to the user in real-time thanks to the speed of 5G and other advanced networks.

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- [https://en.wikipedia.org/wiki/Immersion_\(virtual_reality\)](https://en.wikipedia.org/wiki/Immersion_(virtual_reality))
- <https://www.slideshare.net/virtual-reality-ppt-80531390>



Miss. B. Mythily

Third Year, ECE Department

01517743

mythnara99@gmail.com



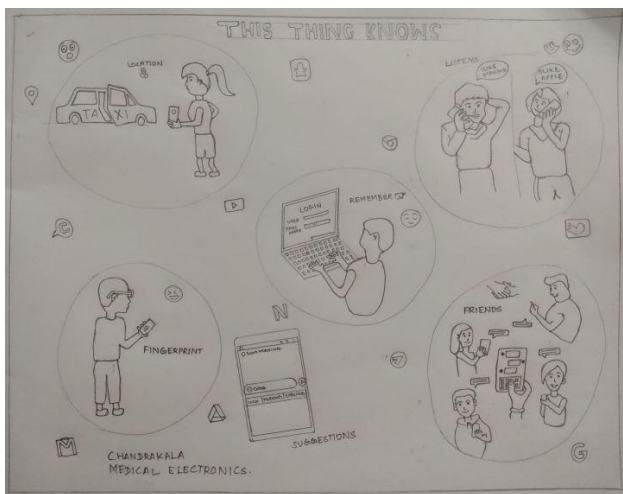
Miss. A. Lakshmi Praba

Third Year, ECE Department

01517741

lakshmiprabaa2001@gmail.com

This Thing Knows



Miss. M. Chandrakala

Second Year, MDE Department

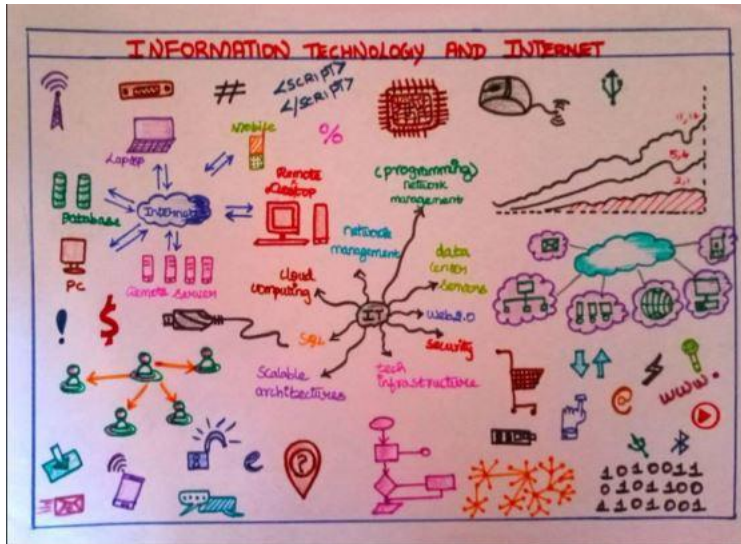
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mchandrakala1242002@gmail.com

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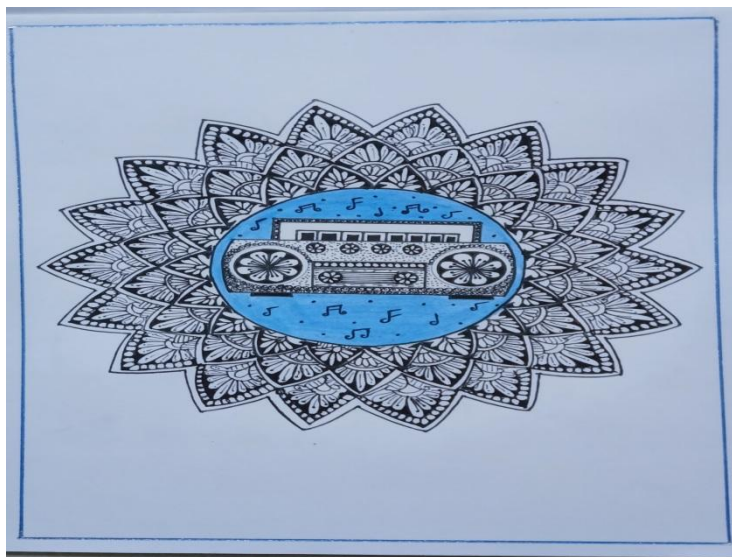


Information technology and Internet



Miss. A. Lakshmi Praba
Third Year, ECE Department
01517741
lakshmiprabaa2001@gmail.com

Is Music Becoming A New Passion For Life?



Miss. K. Snega
Second Year, CSE Department
01517809
snegak30@gmail.com

MAGIC SQUARE

47	58	69	80		12	23	34	45
57	68	79	9	11	22	33	44	
67	78	8	10	21		43	54	56
77		18	20	31	42	53	54	66
6	17		30	41	52	63	65	76
16	27	29	40	51	62		75	5
26	28	39	50	61	72	74		15
36	38	49		71	73	3	14	25
	48	59	70	81	2	13	24	35

Clue : if we add from left to right or top to bottom in any column we get 369



Miss. M. Chandrakala

Second Year, MDE Department

01517860

mchandrakala1242002@gmail.

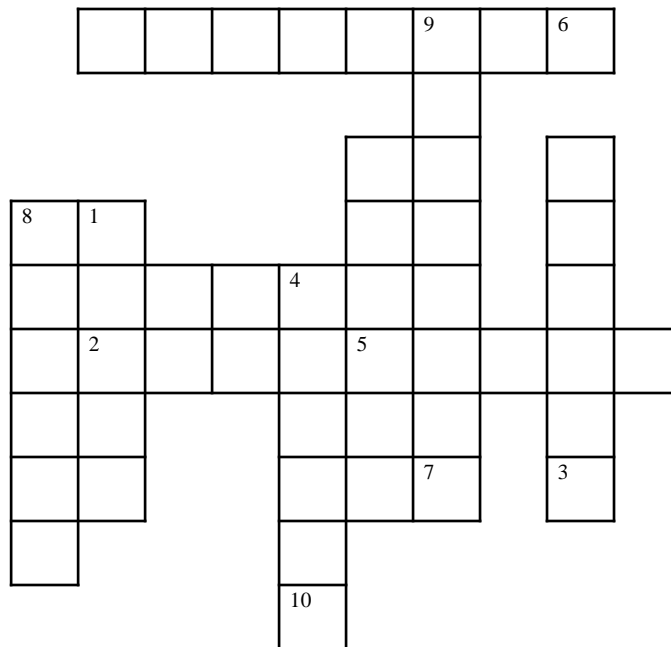
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37	48	59	70	81	2	13	24	35
36	38	49	60	71	73	3	14	25
26	28	39	50	61	72	74	4	25
16	27	29	40	51	62	74	75	5
6	17	19	30	41	52	64	65	76
77	7	18	20	31	42	63	55	66
67	78	8	10	21	32	53	54	56
57	68	79	9	11	22	33	44	46
47	58	69	80	1	12	23	34	45

ANSWER



Word Fun



* Answer will be revealed in the next issue.

Questions :

Up to Down :

1. Which is a type of Electrically-Erasable Programmable Read-Only Memory?
8. The transistorized computer circuits were introduced in ____ generation computer
9. ALU of computer normally contains high speed storage elements called

Down to Up :

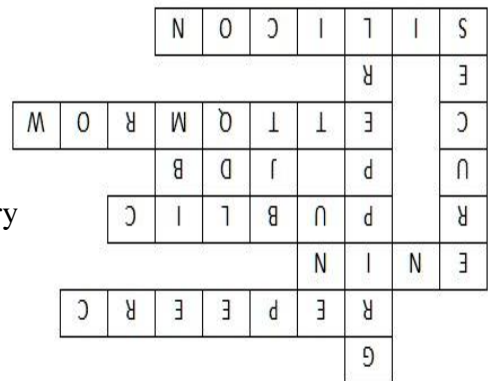
3. Orkut.com is now owned by
5. Google seems to have silently launched a new food delivery and home services
10. A software package to implement a data base is

Left to Right :

2. 'MOV' extension refers usually to what kind of file?.

Right to Left :

4. Genius bars are tech support stations located on the retail stores of which company?
6. What is the first word processor application
7. What is volatile memory in computer system



**PREVIOUS ISSUE
ANSWER FOR**



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Last date for submission

01/03/2020 (Monday)

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srmveccsisb@outlook.com

