



# COFFEE & CODE;

An initiative by the Department of Computer Engineering.

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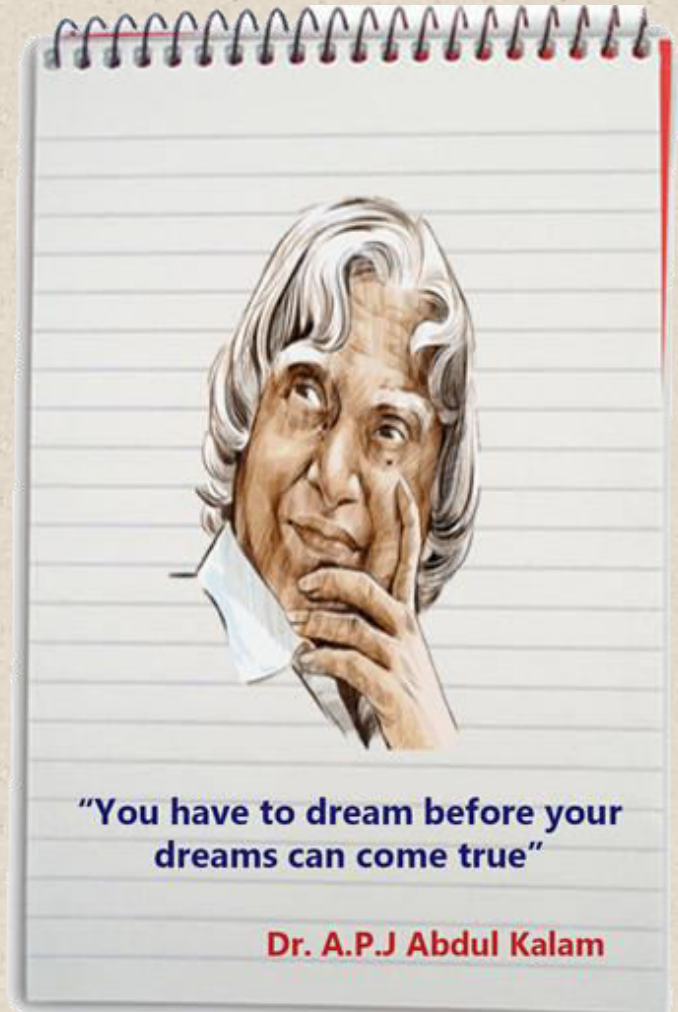
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## VISION

To be recognized as a department that provides quality technical education and research opportunities that eventually caters to helping and serving the community.

## MISSION

- To groom the students to participate in curricular and co-curricular activities by providing efficient resources.
- To motivate the students to solve real-world problems to help the society grow.
- To provide a learning ambience to enhance innovations, team spirit and leadership qualities for students.



**Team** : Mr. Ayush Shetty,  
 Mr. Tejas Gudulekar

**Faculty** : Mr. Sridhar Iyer,  
 Mrs. Hezal Lopes,  
 Ms. Apurva Chaudhari

## Faculty Development Program on Intellectual Property Rights



**DATE :** 21/09/19

**VENUE :** Seminar Hall (1<sup>st</sup> Floor)

**TOPIC :** Intellectual Property Rights

**RESOURCE :** Dr. Prashant Lokhande

**IN ASSOCIATION WITH :** CSI – UCOE Student Chapter

A Faculty Development Programme (FDP) was conducted on 21 September 2019 in association with CSI and with the coordination of **Dr. Dipti Patil**. The speaker for this session was **Dr. Prashant Lokhande** who indeed is a Cyber Crime consultant for the Navi Mumbai police and TPO head of Pillai Engineering College (Navi Mumbai).

The topic covered in this session was “Intellectual Property Rights (IPR)” which is defined as ideas, inventions and creative based on which there is public willingness to bestow the status of property. The main objective of this session was to create awareness among the faculty members, researchers about the benefits of patenting their creative ideas, novel ideas and innovations. With having knowledge of IPR one can have certain exclusive rights for their innovations and creation in order to enable them to reap commercial benefits from their creative/innovating ideas. This session was very informative for all the faculties and attending audience as it covered all topic of IPR that one should know in order to get certain rights for their creations and the speaker also showed a live drafting and submission of Copyrights which made this session even more productive.



## Seminar on React.js

**DATE :** 21/09/19

**VENUE :** Seminar Hall (1<sup>st</sup> Floor)

**TIMING :** 10-12

**TOPIC :** React JS

**RESOURCE :** Mr. Shubham Shirke

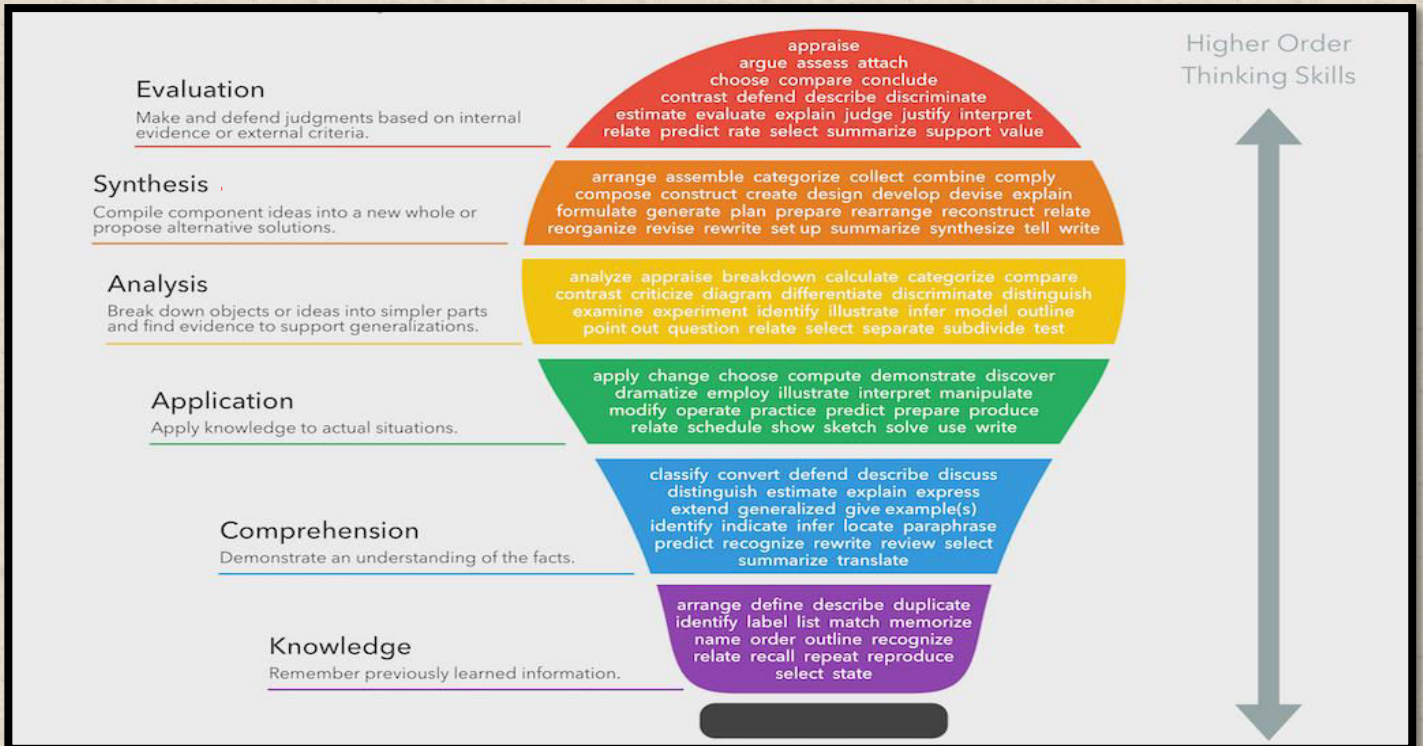
**IN ASSOCIATION WITH :** CESA (Computer Engineering Student Association)



A session on **React.Js** was organized by the CESA (Computer Engineering Student Association) which is a collaboration of computer engineering students where interested students are allowed to conduct seminars/workshops, share their experience and knowledge of the latest trending technologies. The very first session of this committee for this year was conducted by **Mr. Shubham Shirke**, student of TE-COMPS where the topic for the session was "React JS". React is a front-end library developed by Facebook. It is used for handling the view layer for web and mobile apps. It is currently one of the most popular javascript libraries and has a strong foundation and large community behind it. In this session, Shubham Shirke shared his experience about React and told why one should learn React and its benefits. So as Shubham covered all the basics of React that one should know before getting started to learn React and even showed some of the practical coding of React JS. The session was very informative and encouraging which leads many students gaining interest in learning react and using them in their projects. As a next step for learning React, Shubham and CESA coordinators are planning to conduct a hands-on workshop in which they will teach to create a dynamic web application using React JS and firebase. The event was coordinated by **Mrs. Ankita Kadu**.



# Session on Bloom's Taxonomy



**DATE : 17/08/19**

**VENUE : 219**

**TOPIC : Bloom's Taxonomy**

**RESOURCE : Dr. Dipti Patil**

**IN ASSOCIATION WITH : CESA (Computer Engineering Student Association)**



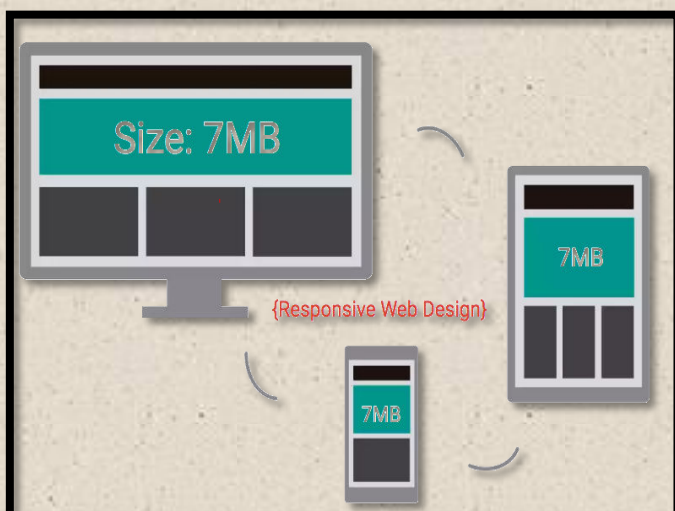
On 17th August 19, an NBA awareness program and Blooms taxonomy training session was held for the faculties of UCOE. The program and session were carried out by **Dr. Dipti Patil** of the Computer Engineering Department.

Bloom's Taxonomy is a hierarchical ordering of cognitive skills that can, among countless other uses, help teachers teach and students learn.

For example, Bloom's Taxonomy can be used to:

- create assessments
- plan lessons (see 249 Bloom's Taxonomy Verbs For Critical Thinking)
- evaluate the complexity of assignments
- design curriculum maps
- develop online courses
- plan project-based learning
- self-assessment, more

## Workshop on Progressive Web Apps



**DATE :** 04/10/19

**VENUE :** Computer Center

**TOPIC :** Progressive Web Apps

**RESOURCE :** Mr. Sridhar Iyer

**IN ASSOCIATION WITH :** IETE- UCOE  
Student Chapter

A 2 hour introductory workshop session on **Progressive Web Apps (PWA)** was conducted by **Mr. Sridhar Iyer** for the IETE Student Chapter Members of UCOE.

The session was mainly aimed to focus on the latest technology (PWA) touted as a replacement of existing native mobile apps.

A brief introduction of PWA was followed by a complete hands-on session on creating a progressive web app from scratch and even hosting it online for sharing purpose.



PWA's make use of **Node.js**, an open-source, cross-platform, JavaScript runtime environment that executes JavaScript code outside of a browser. PWA's enjoy the advantages of both a website and a native app by providing "best of both world" like experience to the user.

Many big organisations like the Flipkart itself uses a PWA instead of a traditional web app indicating the career opportunities.

This session was the first of the many such sessions to be conducted in the near future under the IETE Student chapter.

## CSI TECHNEXT 2019 AWARD WINNERS



## · Congratulations ·

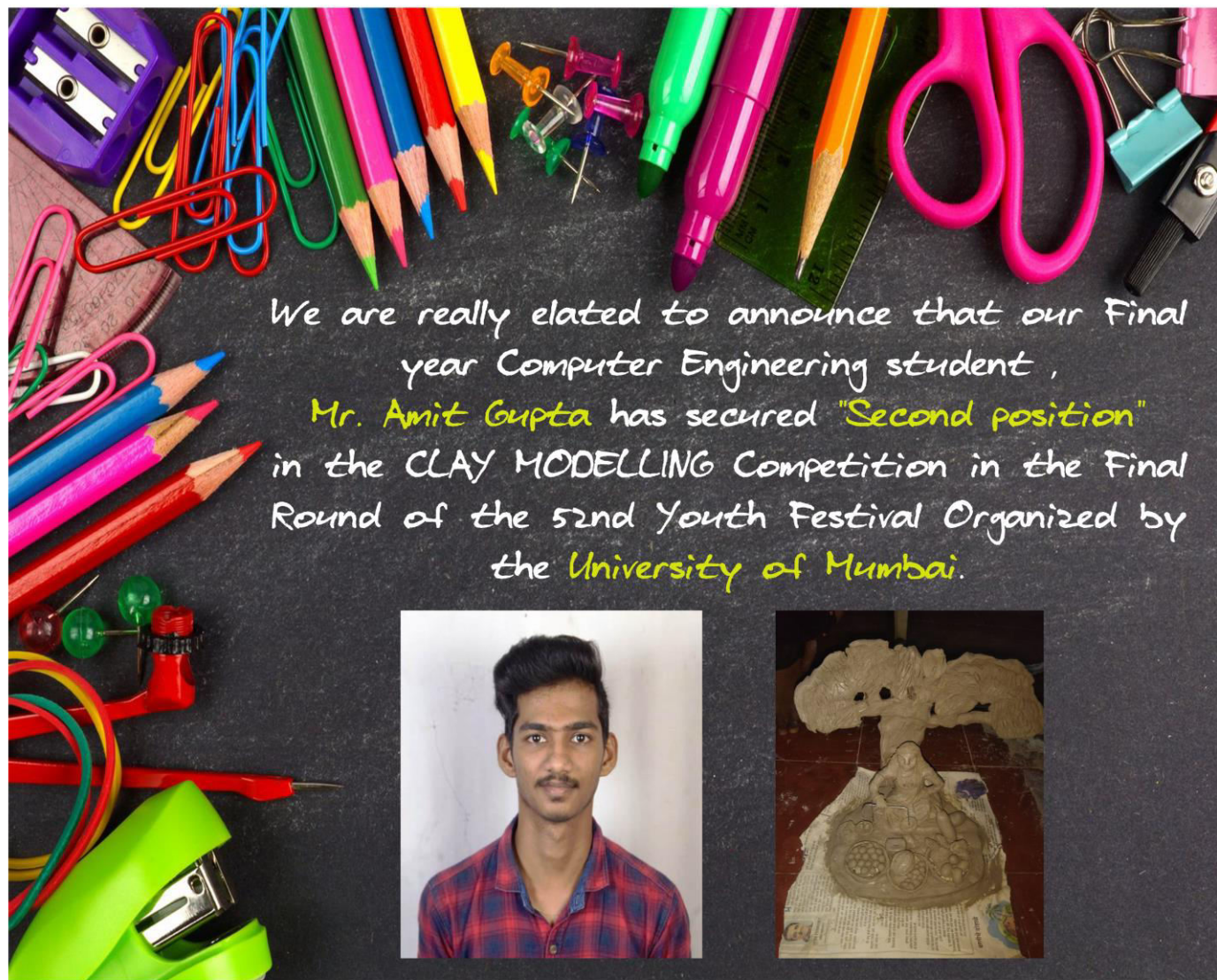
Universal College of Engineering has bagged three awards at the Prestigious TechNext 2019 organized by the Computer Society of India (CSI).

1. Best Institute of the year award under the sub category  
“Tech and Innovation Ecosystem”
2. Best Faculty of the Year - **Mr Sridhar Iyer** in the sub category  
“Authoring books in Contemporary Subjects”
3. Best Social Impact Project - **Mrs. Kanchan Dabre and Mr. Aniket Kore**

## Winner at 52<sup>nd</sup> Youth Festival University Round

This year, we saw an enthusiastic participation by our college students at Mumbai University's 52nd Youth festival celebration. The competition witnessed performances by our students in as many as thirty unique events.

Not only did our students made their presence felt at the district level round of the competition but many also qualified for the Inter-Zonal level round. Among them Mr. Amit Gupta (BE Comps A) secured 2nd prize in the Inter-Zonal (University Level) for the Clay Modeling Competition held at the Department of Student Welfare, University of Mumbai, Churchgate. Our heartiest congratulations to Amit.



SEND YOUR ARTICLES AT : [codecoffeeucoe@gmail.com](mailto:codecoffeeucoe@gmail.com)

## Article on Singapore India Hackathon

The Singapore-India Hackathon, an initiative of Prime Minister Narendra Modi commenced its second edition on the 28th of September and concluded on the 30th of Sept Monday. Twenty teams took part in the 36-hour long hackathon. Each team had three students from both countries for the exchange of culture and ideas.

Indian Prime Minister Narendra Modi, Minister of Human Resource Development Ramesh Pokhriyal, and Singapore's Education Minister Ong Ye Kung presented prizes to the winners of the Singapore-India Hackathon at Indian Institute of Technology Madras (IIT Madras) in Chennai, Tamil Nadu.

Prime Minister Narendra Modi while congratulating the winners of Singapore-India Hackathon in Chennai appreciated an idea given by the students and said that he would discuss the idea with the Speaker as it would help in Parliament. The idea given by the students involves the monitoring of people sitting through activity and helps to detect who is paying attention and who is not.

"My young friends here have solved various problems today, I especially liked the solution about cameras to detect who is paying attention, and know what will happen you know? I will talk to my Speaker in Parliament and I am sure it will be very useful to Parliament," the Prime Minister said as the audience at the prize distribution ceremony of Singapore-India Hackathon at IIT-Madras laughed and clapped.

The top prize of \$10,000 went to a team for their innovative solution to monitor air impurities through an array of sensors installed in a potted plant. Upon detecting high levels of impurities, small fans will automatically switch on to circulate clean air from the base of the plant. Another team presented a sustainable and safe solution to prevent accidental usage of used medical syringes, through an automated disposal system that crushes the syringe, and a colour-dye system that turns blue if the syringe had been used.





## Reducing Costs and Commutes with a 5G-Based Software-Defined ITS

Smoother traffic flows and safer roads could be around the corner with Intelligent Transportation Systems, or ITS, a technology that uses the Internet of Things (IoT) to gather and provide data on traffic speeds, car distances and potential hazards to drivers. While this technology has existed for some time, current deployments are costly and time consuming. To address these constraints, researchers have proposed a 5G-based software-defined network architecture that could reduce the expenses and time associated with ITS deployment.

In the ITS concept, all vehicles on the road would be in constant communication with other vehicles and with the infrastructure. This requires on-board equipment and roadside units (RSUs) to provide directions and alerts to drivers.

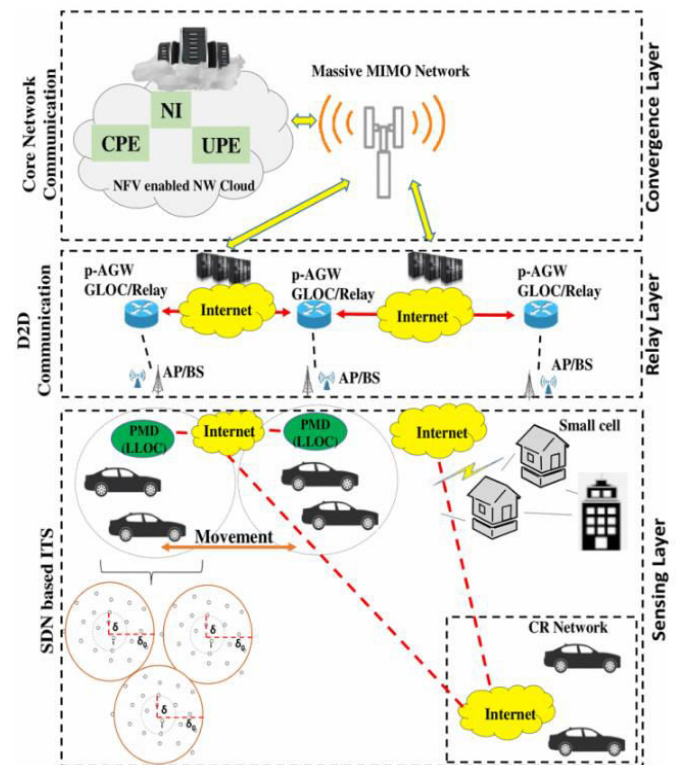
The new system minimizes ITS deployment costs by using an architecture incorporated with both 5G – mobile communication that uses less energy and offers expanded system capacity – and software defined-networking (SDN). SDN is a cloud computing architecture where a control plane is physically separated from a forwarding plane that sends off any commands the control plane provides.

With the new ITS architecture, a 5G network gathers and transmits data while the SDN processes data collected by the system. 5G provides more bandwidth and higher data rates to handle the large amounts of data generated by the ITS, and the SDN architecture provides flexibility and easier data management.

The 5G network involves three function layers: the convergence, relay and sensing layer. The core network of the system makes up the convergence layer, and its job is to send out and process data transmitted by a 5G-enabled Multiple-In Multiple Out (MIMO) Network that can handle transmitting multiple data packets at one time.

The relay layer's role is to assist in communication to individual vehicles in the ITS. Multiple interconnected RSUs disseminate data between

the sensing and convergence layers using device-to-device communications. The sensing layer gathers data through IoT-based devices embedded into vehicles as well as IoT sensors dispersed throughout smart cities. With this data, the sensing layer can provide traffic information to drivers after the core network processes data.

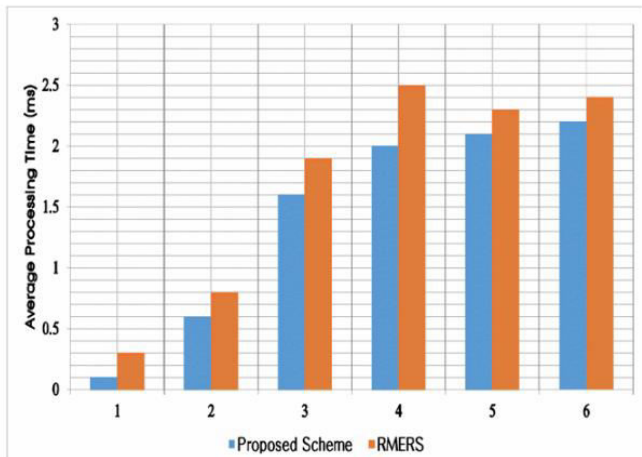


Within the 5G architecture, the SDN-core network is used to process the data aggregated by the IoT sensors. The SDN-core network uses a SDN controller to optimize data collection and transmission. The controller employs a traffic engineering method to determine the priority of routers in the network based on traffic congestion. This allows the network to provide directions and vehicle positions in real time.

To process data, the SDN core network uses an algorithm within the Hadoop data system to more efficiently process large amounts of data by adjusting network node use if certain nodes aren't needed.

The SDN is also programmed to classify traffic events and generate decisions after filtering out unnecessary data.

“The main purpose of our architecture is to provide constant connectivity between vehicles and the SDN controller,” said Syed Hassan Ahmed, assistant professor, Georgia Southern University. “Big data always requires a large amount of time and processing power, which makes the idea of a real-time ITS cost prohibitive. Our novel architecture provides low-cost implementation with high bandwidth and less end-to-end delay.”



To test their system, the researchers ran simulations using C programming language to compare their architecture’s performance against RMERS, an existing ITS architecture. The results showed their system produced more traffic data than the other system, and revealed the researchers’ system consistently required less processing time for queries than RMERS.

Following these positive results, the team wants to move their proposed architecture to real-time implementation. The researchers are also exploring if they can incorporate big data analytics to their system by adding deep learning algorithms to the 5G architecture.

While more development is needed, this research is a major step toward making the ITS more efficient and economical. Soon these developments will enable ITS to create safer and more efficient roads and highways.

SOURCE : <https://bit.ly/2VxWyPp>

## Image Recognition Method Based on Deep Learning

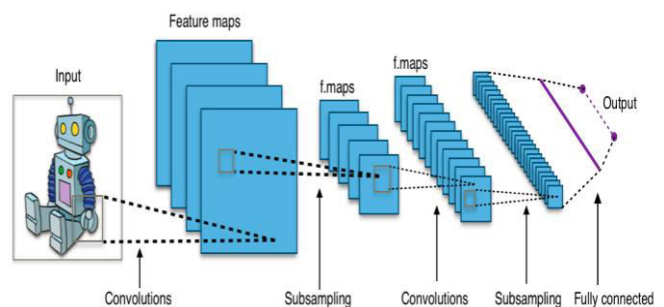
**ABSTRACT:** Deep learning algorithms are a subset of the machine learning algorithms, which aim at discovering multiple levels of distributed representations. Recently, numerous deep learning algorithms have been proposed to solve traditional artificial intelligence problems. This work aims to review the state-of-the-art in deep learning algorithms in computer vision by highlighting the contributions and challenges from recent research papers. It first gives an overview of various deep learning approaches and their recent developments, and then briefly describes their applications in diverse vision tasks. Finally, the paper summarizes the future trends and challenges in designing and training deep neural networks.

**RECENT DEVELOPMENTS:** In recent years, deep learning has been extensively studied in the field of computer vision and as a consequence, a large number of related approaches have emerged. Generally, these methods can be divided into four categories according to the basic method they are derived from:

Convolutional Neural Networks (CNNs), Restricted Boltzmann Machines (RBMs), Autoencoder and Sparse Coding.

### CONVOLUTIONAL NEURAL NETWORKS (CNNs):

The Convolutional Neural Networks (CNN) is one of the most notable deep learning approaches where multiple layers are trained in a robust manner. Generally, a CNN consists of three main neural layers, which are convolutional layers, pooling layers and fully connected layers. Different kinds of layers play different roles.



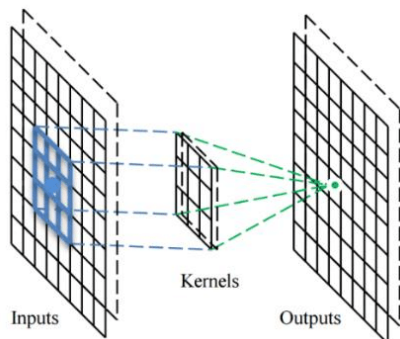
There are two stages for training the network: a forward stage and a backward stage. First, the main goal of the forward stage is to represent the input image with the current parameters (weights and bias) in each layer. Then the prediction output is used to compute the loss cost with the ground truth labels.

Second, based on the loss cost, the backward stage computes the gradients of each parameter with chain rules. All the parameters are updated based on the gradients, and are prepared for the next forward computation. After sufficient iterations of the forward and backward stages, the network learning can be stopped.

Generally, a CNN is a hierarchical neural network whose convolutional layers alternate with pooling layers, followed by some fully connected layers.

### Convolutional Layers:

In the convolutional layers, a CNN utilizes various Kernels to convolve the whole image as well as the Intermediate feature maps, generating various feature maps.



### Pooling Layers:

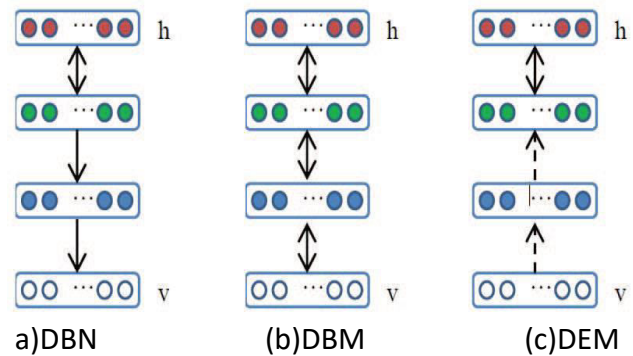
Generally, a pooling layer follows a convolutional layer, and can be used to reduce the dimensions of feature maps and network parameters. Similar to convolutional layers, pooling layers are also translation invariant, because their computations take neighbouring pixels into account. Average pooling and max pooling are the most commonly used strategies.

### RESTRICTED BOLTZMANN MACHINES (RBMS)

A Restricted Boltzmann Machine (RBM) is a generative stochastic neural network and was

proposed by Hinton et al. in 1986.

An RBM is a variant of the Boltzmann Machine, with the restriction that the visible units and hidden units must form a bipartite graph. This restriction allows for more efficient training algorithms, in particular the gradient-based contrastive divergence algorithm. Utilizing RBMs as learning modules, we can compose the following deep models: Deep Belief Networks (DBNs), Deep Boltzmann Machines (DBMs) and Deep Energy Models (DEMs).



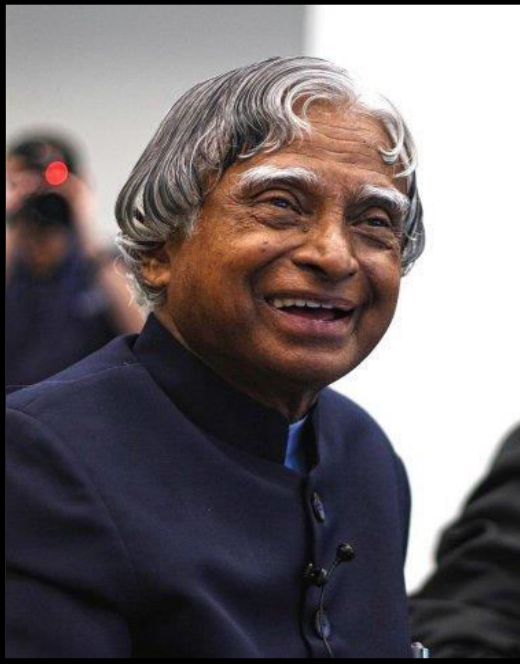
### AUTOENCODER:

The auto-encoder is a special type of artificial neural network used for learning efficient encodings. Instead of training the network to predict some target value  $Y$  given inputs  $X$ , an auto-encoder is trained to reconstruct its own inputs  $X$ , therefore, the output vectors have the same dimensionality as the input vector. Auto-encoder is often trained with a variant of back-propagation, e.g. the conjugate gradient method. Though often reasonably effective, this model could become quite ineffective if errors are present in the first few layers. This may cause the network to learn to reconstruct the average of the training data. A proper approach to remove this problem is to pre-train the network with initial weights that approximate the final solution. There are also variants of auto-encoder proposed to make the representation as "constant" as possible with respect to the changes in input.

### CONCLUSION:

This paper describes the challenges and summarizes the new trends in designing and training deep neural networks, along with several directions that may be further explored in the future.

## Reminiscing the “MISSILE MAN OF INDIA”



27 July 2015 will remain one of the saddest days for the country, as, on this very day, the country's powerhouse of inspiration left his mortal body for heavenly abode. He was delivering his last lecture at IIM, Shillong when he suffered a cardiac arrest.

Avul Pakir Jainulabdeen Abdul Kalam was an aerospace scientist who served as the 11th President of India from 2002 to 2007. He was born on 15<sup>th</sup> October 1931, raised in Rameswaram, Tamil Nadu and studied physics and aerospace engineering

From the very beginning, Avul Pakir Jainulabdeen Abdul Kalam was a hardworking boy. Apart from focussing on his studies, he also had delivered newspapers to further support his family. No wonder this humble boy turned out to be so successful as we all know, with hard work cometh great success.

Once, during an interview, Kalam was asked how he would love to be remembered by the nation, to which he replied that he wants to be remembered as a teacher first. While taking his last breath, he died while doing what he loved.

Asking about his secret of success, Kalam replied: "Have an aim in life, acquire knowledge through all possible sources, work hard and never accept defeat by the problem, always defeat the problem and succeed". The 'Missile Man' of India gained immense success with his satellite launch vehicle technology and warhead carrying capable ballistic missiles.

Kalam earned love and respect from everywhere. Not just in India, but also the whole world was mesmerized by his determination and personality. As a token of respect and honour, NASA named a new organism after the much-loved A.P.J Abdul Kalam. The bacteria is called *Solibacillus kalamii*, which has been only traced at International Space Station(ISS) and not on earth.

On an important note, Kalam's visit to Switzerland is commemorated as Science Day in the country. The Swiss government declared this in his honour after the demise of this magnificent personality. In an effort to pay respect to India's most favourite president and scientist, the country renamed the Wheeler Island, situated off the coast of Odisha, to Dr Abdul Kalam Island on 4 September 2015. This island hosts the Integrated Test Range missile testing facility, marking it as the missile test facility for most missiles of India. Speaking about corruption in India, Kalam beautifully stated that the 'reform' has to start from our home itself. Therefore, if a home is corruption free, our village and city will be corruption free, gradually our state will be corruption free and the nation as well.

Kalam for long believed in charity; his entire presidential salary was donated to a trust named PURA (Providing Urban Amenities to Rural Areas), which was also formed by himself. The list of his good deeds is innumerable and invaluable. APJ Kalam has always been an important asset to the country, trying to help the nation in as many ways he can. Even before his death, Kalam had given a piece of advice to the DRDO chief Satheesh Reddy, which is to work on reusable missiles system that can deliver a payload and launch it, come back and take another payload.