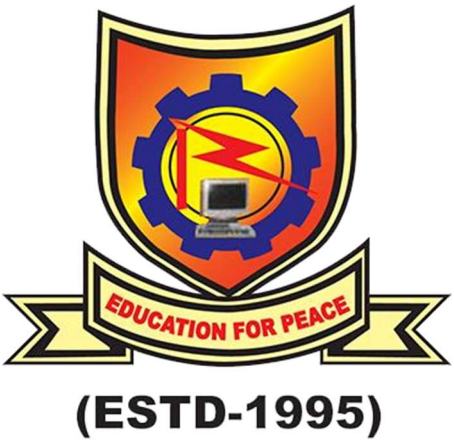
RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)
NANDYAL



EDITORIAL BOARD

About RGMCET

Rajeev Gandhi Memorial College of Engineering and Technologywas founded in the year 1995. It is located in a 32.04 acresprawling campus on NH-40 (old NH-18) at Nandyal, Kurnool(Dist), Andhra Pradesh.

It is the dedicated commitment and efforts of our Chairman,the man with vision "Vidyarathna" Dr. M. Santhiramudu, whostarted the institution with a motto "EDUCATION FOR PEACE". RGMCET is a road of elegant educational journey, yet path breaking in different dimensions.

Rajeev Gandhi Memorial College of Engineering & Technology (Autonomous) is Ranked in the band of 251-300 in Engineering category as per National Institutional Ranking Framework (NIRF) - 2020, Ministry of Human Resource Development (MHRD), Govt. of India.

RGMCET Vision

- To develop this rural based engineering college into an institute of technical education with global standards.
- To become an institute of excellence which contributesto the needs of society.
- To inculcate value based education with noble goal of " Education for peace and progress".

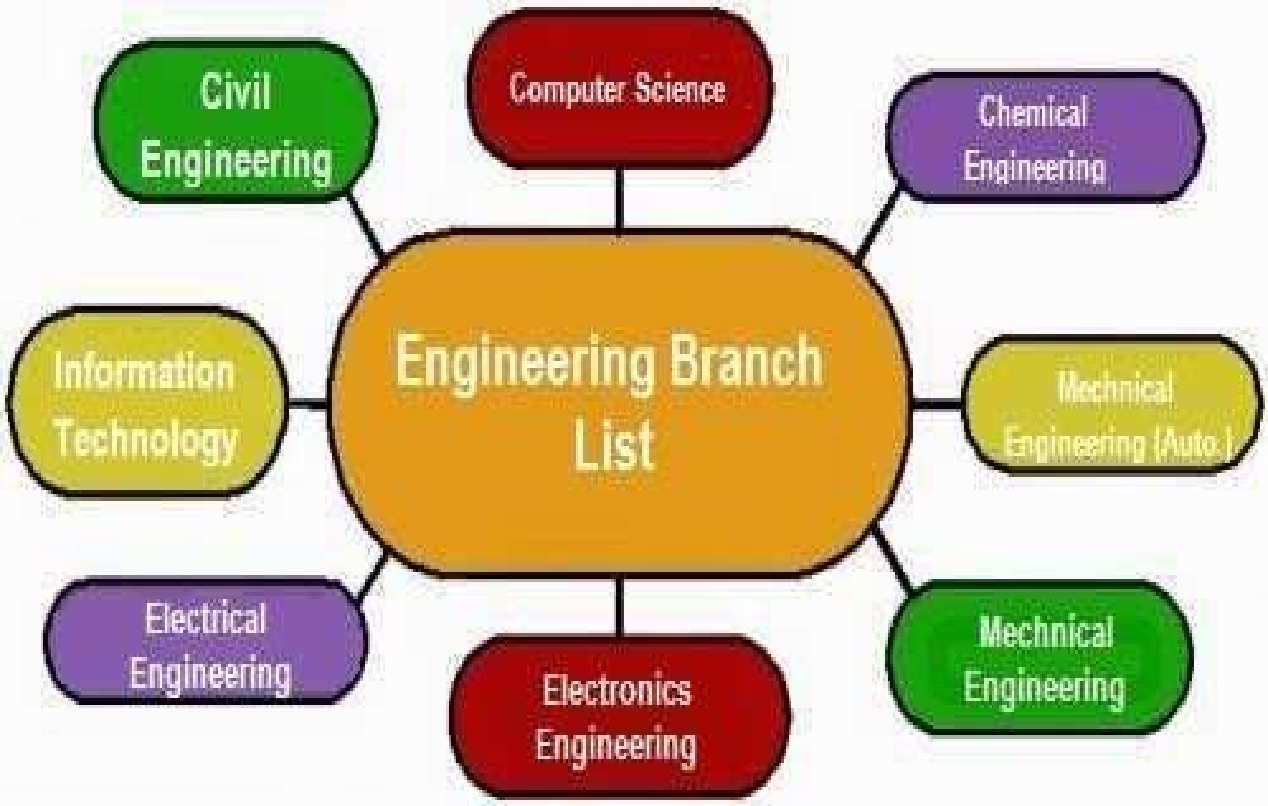
RGMCET Mission

- To build a world class undergraduate program with all required infrastructure that provides strong theoretical knowledge supplemented by the state of art skills.
- To establish postgraduate programs in basic and cuttingedge technologies.
- To create conductive ambiance to induce and nurture research.
- To turn young graduates to success orientedentrepreneurs.
- To develop linkage with industries to have strong industry institute interaction.
- To offer demand driven courses to meet the needs of the industry and society.

- To inculcate human values and ethos into the educationsystem for an all-round development of students.

RGMCET Quality Policy

- To improve the teaching and learning.
- To evaluate the performance of students at regular intervals and take necessary steps for betterment.
- To establish and develop centers of excellence for researchand consultancy.
- To prepare students to face the competition in the market globally and realize the responsibilities as true citizen to serve the nation and uplift the country's pride.



About COMPUTER SCIENCE AND ENGINEERING

CSE Department Vision

- To empower students with cutting edge technologies in computerscience and engineering.
- To train the students as entrepreneurs in computer science and engineering to address the needs of the society.
- To develop smart applications to disseminate information to ruralpeople.

CSE Department Mission

- To become the best computer science and engineering departmentin the region offering undergraduate, post graduate and researchprograms in collaboration with industry.
- To incubate, apply and spread innovative ideas by collaborating with relevant industries and R & D labs through focused researchgroups.
- To provide exposure to the students in the latest tools and technologies to develop smart applications for the society.

Program Specific Outcomes (PSO's)

1. Students will have the ability to understand the principles and working of computer systems to assess the hardware and softwareaspects of computer systems.

2. Students will have the ability to understand the structure and development methodologies of software system, that possess professional skills and knowledge of software design process.
3. Students will have the ability to use knowledge in various domainsto identify research gaps and hence to provide solution to new ideas and innovations.

Program Educational Outcomes (PEO's):

1. To Pursue a successful career in the field of Computer Science& Engineering or a related field utilizing his/her education and contribute to the profession as an excellent employee, or as an entrepreneur.
2. To be aware of the developments in the field of Computer Science & Engineering; continuously enhance their knowledge informally or by pursuing graduate studies.
3. To Engage in research and inquiry leading to new innovations and products.
4. To be able to work effectively in multidisciplinary and multicultural environments.
5. To be responsible members and leaders of their communities, understand the human, social and environmental context of theirprofession and contribute positively to the needs of individuals and society at large.

Program Outcomes (PO's) - Engineering Graduates will be ableto:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specializationto the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature,and analyze complex engineering problems reaching substantiatedconclusions using first principles of mathematics, natural sciences,and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processesthat meet the specified needs with appropriate consideration forthe public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments,analysis and interpretation of data, and synthesis of theinformation to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriatetechniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activitieswith an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal andcultural issues and the consequent responsibilities relevant to theprofessional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethicsand responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations,and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles andapply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Incipience:

A short note for readers... We want to thank all ofthose who supported us in Compass Magazine. We will alwaysbe gratified to the faculty who supported us through this journey.

The essential purpose of Compass Magazine is to inform, engage, inspire and entertain a diverse readership including faculty, staff, students and other friends ofRGMCET.

Our magazine glides you through a series of queriesyou get during the phase of B.Tech and we tried to possiblyfind answers and solutions for your queries and problems.

You will get to know how the scope of Computer Science and Engineering has in present society and what are the important guidelines you need to follow in order to embellish your success in stream of your choice. So we wish you a happy experience and good luck with your future.

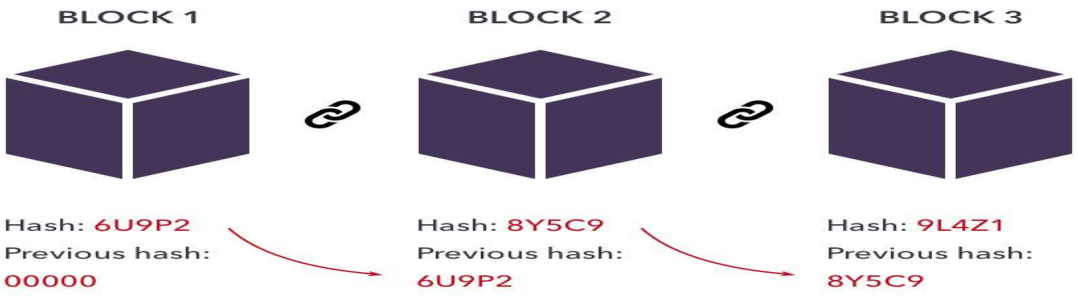
A Quick Glimpse:

Block Chain Technology

Blockchain:

A blockchain is "a distributed database that maintains a continuously growing list of ordered records, called blocks." These blocks "are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data.

- A block is a set of transactions that happen over the network.
- The chain is where blocks are linked to each other in a way that the next block contains hash of the previous one.
- Even a small change in the previous block can change its hash and break the whole chain, making it difficult to tamper data
- The data which is stored inside a block depends on the type of blockchain.



Contents of a Block:

Each block in the blockchain stores the following information in it:

- **Index:** Position of the block in blockchain. Index of genesis block is 0.
- **Time stamp:** The time when that particular block was created.
- **Hash:** Numeric value that uniquely identifies data just like our fingerprints.
- **Previous hash:** Hash value of the previous block. For genesis block, this value is 0.
- **Data:** Data stored on the node. For example, transactions.
- **Nonce:** It is a number used to find a valid hash. To generate this number, the processing power is used.

How Does Blockchain Technology Work?

Blockchain Transaction Process

- Some person requests a transaction. The transaction could be involved cryptocurrency, contracts, records, or other information.
- The requested transaction is broadcasted to a P2P network with the help of nodes.
- The network of nodes validates the transaction and the user's status with the help of known algorithms.
- Once the transaction is complete, the new block is then added to the existing blockchain. In such a way that is permanent and unalterable.

Properties/Pillars of Blockchain Technology

The three main properties of Blockchain Technology are:

- **Decentralization:** In a decentralized system, the information is not stored by one single entity. In fact, everyone in the network owns the information.
- **Transparency:** Because every node or participant in Blockchain has a copy of the Blockchain data, they have access to all transaction data.
- **Immutability:** It means that once something has been entered into the blockchain, it cannot be tampered with.

Key Characteristics / Benefits of Blockchain Technology:

- **Open:** Anyone can access blockchain.
- **Distributed or Decentralised:** Not under the control of any single authority.
- **Efficient:** Fast and Scalable.
- **Permanent:** Once a transaction is done, it is persistent and can't be altered.

- **Time-saving:** No central Authority verification needed for settlements making the process faster and cheaper.
- **Cost-saving:** A Blockchain network reduces expenses in several ways. No need for third-party verification. Participants can share assets directly. Intermediaries are reduced.
- **Tighter security:** No one can temper with Blockchain Data as it shared among millions of Participant. The system is safe against cybercrimes and Fraud.
- **Secure:** There is no unauthorized access to Blockchain made possible through Permissions and Cryptography.
- **Transparent:** Because every node or participant in Blockchain has a copy of the Blockchain data, they have access to all transaction data.

Distributed Ledger Technology(DLT):

DLT stands for **Distributed Ledger Technology**. It is also known as a "shared ledger". DLT originates from the peer-to-peer networkIn any P2P network, peers communicate with each other without the need for a centralized entity. Technically, a distributed ledger technology is possible through a peer-to-peer network.

The decentralization feature also provides better **security, transparency, and trust among parties using it**.

Key Points:

1. It is a decentralized technology and every node will maintain the ledger, and if any data changes happen, the ledger will get updated.
2. Even small updates made to the ledger are reflected and the history of that change is sent to all participants in a matter of seconds.
3. DLT is a decentralized database managed by multiple participants.
4. All the nodes in this technology have equal status in terms of authority.

The voting or participation of all the nodes depends on the rules of that ledger. In the case of bitcoin, the Proof of Work consensus mechanism is used for the participation of each node.

Blockchain Types:

Public:

In this type of blockchain, ledgers are visible to everyone on the internet. It allows anyone to verify and add a block of transactions to the blockchain. Public networks have incentives for people to join and are free for use. Anyone can use a public blockchain network.

Private:

The private blockchain is within a single organization. It allows only specific people of the organization to verify and add transaction blocks. However, everyone on the internet is generally allowed to view it.

Consortium:

In this Blockchain variant, only a group of organizations can verify and add transactions. Here, the ledger can be open or restricted to select groups. Consortium blockchain is used cross-organizations. It is only controlled by pre-authorized nodes.

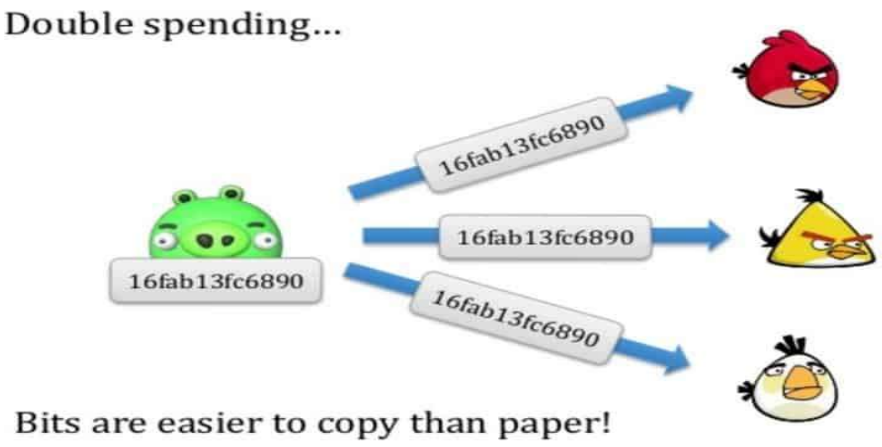
ISSUES in Block Chain Technology:

Double Spending:

Double spending means spending the same money twice.

As we know, any transaction can be processed only in two ways. One is offline, and another is online.

- **Offline:** A transaction which involves physical currency or cash is known as an offline transaction.
- **Online:** A transaction which involves digital cash is known as an online transaction.



How Bitcoin handles the Double Spending Problem?

Bitcoin handles the double-spending problem by implementing a **confirmation mechanism** and maintaining a **universal ledger** called blockchain.

Let us suppose you have 1 BTC and try to spend it twice. You made the 1 BTC transaction to Alice. Again, you sign and send the same 1 BTC transaction to Bob.

Both transactions go into the pool of unconfirmed transactions where many unconfirmed transactions are stored already. The unconfirmed transactions are transactions which do not pick by anyone.

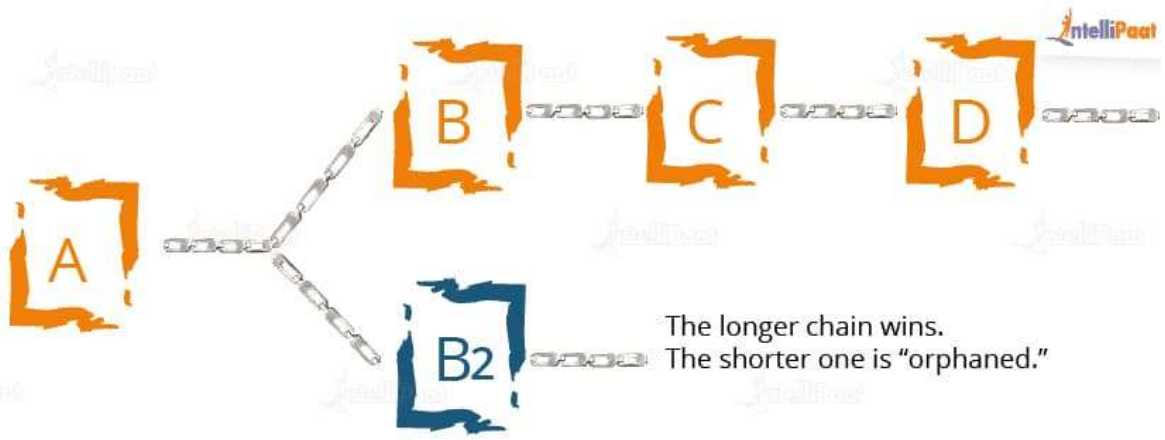
Now, whichever transaction first got confirmations and was verified by miners, will be valid. Another transaction which could not get enough confirmations will be pulled out from the network.

Forking:

A fork is **a change to the blockchain protocol.** It is essentially a divergence from the previous version of blockchain.

The decentralized nature of public blockchains means that the participants on the network must be able to agree as to the **shared state** of the blockchain. The unanimous consensus among the network nodes results in a single blockchain that **contains verified data that the network asserts to be correct.**However, many times, the nodes in the network cannot come to a unanimous consensus regarding the **future state of the blockchain**. This event leads

to **forks**, meaning that it leads to a point in which the ideal single chain of blocks is split into two or more chains, that are all valid.



Types of Forks

There are two types of forks:

- Hard forks
- Soft forks

Hard Forks

When there is a change in the software that runs on full nodes to function as a network participant, the new blocks mined based on the new rules in the blockchain protocol are not considered valid by the old version of the software. When hard forks occur, new currency comes into existence. An equivalent quantity of currency is distributed to the full nodes that choose to upgrade their software so that no material loss occurs. The final decision to join which chain rests with the full nodes. If the full nodes choose to join with the new chain, the software is upgraded to make newer transactions valid, while the nodes that do not choose to upgrade their software continue to work the way they used to work.

Soft Forks

When there is a change in the software that runs on full nodes to function as a network participant, new blocks are mined **based on new rules in the blockchain protocol** and are also **considered valid by the old version of the software**. This feature is also called backward compatibility.

Why and how do BlockChain Forks Occur?

There are three major reasons why blockchain forks occur:

- Adding new functionalities
- Fixing security issues
- Reversing transactions

Bitcoin Mining:

Bitcoin mining is a process that helps verifying bitcoin transactions, and creating new bitcoin.

How to Start Mining Bitcoin

- Choose Your Bitcoin Mining Hardware
- Decide Between Solo and Pooled Mining
- Install and Configure Bitcoin Mining Software
- Begin Mining for Bitcoin
- Monitor and Fine Tune Your Mining Rig
- Wallet

How Bitcoin mining works

- To successfully add a block, Bitcoin miners compete to solve extremely complex math problems that require the use of expensive computers and enormous amounts of electricity.
- To complete the mining process, miners must be first to arrive at the correct or closest answer to the question.
- The process of guessing the correct number (hash) is known as proof of work.
- Miners guess the target hash by randomly making as many guesses as quickly as they can, which requires major computing power.
- The difficulty only increases as more miners join the network.

Cryptographic Hash

A cryptographic hash is a function that outputs a **fixed-size digest** for a variable-length input.

From the above picture, it is clear that even the slightest change in an alphabet in the input sentence can drastically change the hash obtained. Therefore hashes can be used to **verify integrity**.

Message Digest (MD)

Secure Hash Function (SHA)

Properties of Cryptographic hash functions:

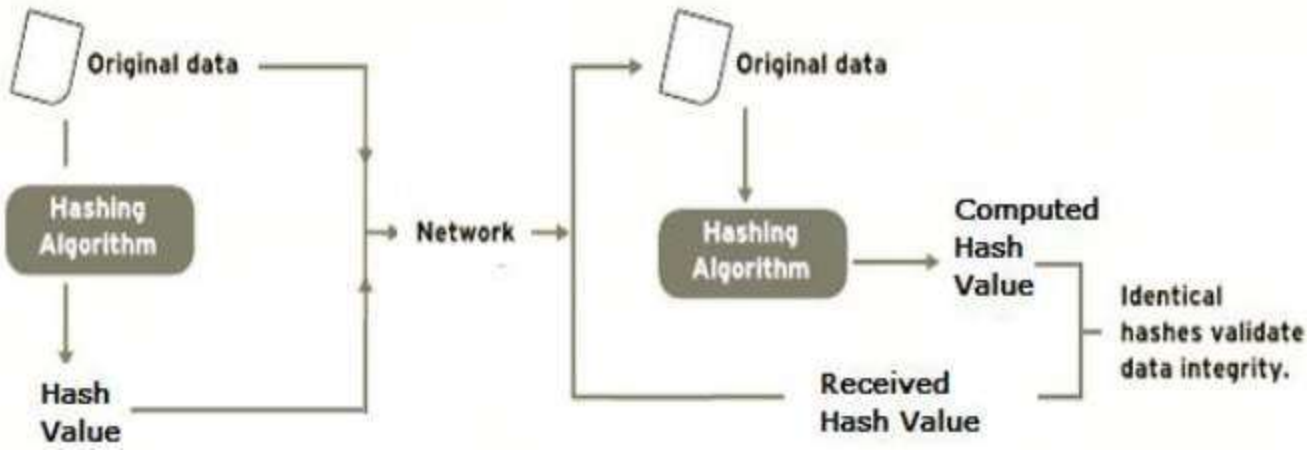
- **Non-reversibility, or one-way function:** A good hash should make it very hard to reconstruct the original password from the output or hash.
- **Diffusion, or avalanche effect:** A change in just one bit of the original password should result in change to half the bits of its hash.
- **Determinism**: A given password must always generate the same hash value or enciphered text.
- **Collision resistance:** It should be hard to find two different passwords that hash to the same enciphered text.
- **Non-predictable:** The hash value should not be predictable from the password.

Applications of Hash Functions

There are two direct applications of hash function based on its cryptographic properties.

Password Storage

Data Integrity Check



Cryptographic Nonce:

- A cryptographic nonce is a randomly generated number designed to keep communications private and protect against replay attacks (**Replay attacks are when an attacker intercepts authentication data in transit and uses it later to gain access to the protected network**).
- Nonce in cryptography means **"number once"** and this number is only used one time in a cryptographic communication.
- A nonce often includes a **timestamp**, which means it is only valid during a specific amount of time.

What is Zero-Knowledge Proof?

A zero-knowledge proof (ZKP) is a mathematical technique to verify the truth of information without revealing the information itself.

Properties of Zero-Knowledge Proofs

- **Completeness:** If the information provided by the prover is true, then a ZKP method must enable the verifier to verify that the prover is telling the truth.
- **Soundness:** If the information provided by the prover is false, the verifier won't be convinced in any scenario (even if the prover says that the statement is true for some small probability).
- **Zero-Knowledge:** In both cases, verifier won't be able to know any information beyond that the statement is true or false.

Types of Zero-Knowledge Proof:

- **Interactive zero-knowledge proofs:** In this type of ZKPs, the prover and the verifier interact several times. The verifier challenges the prover who provides replies to these challenges until the verifier is convinced.
- **Non-interactive zero-knowledge proofs:** In this type of ZKPs, proof delivered by the prover can be verified by the verifier only once at any time. This type of ZKPs requires more computational power than interactive ZKPs.

Consenses Algorithm:

- It is a procedure through which all the peers of the blockchain network reach a **common agreement about the present state of the distributed ledger.**
- It is a process used to **achieve agreement on a single data value among distributed systems**. These algorithms are designed to achieve reliability in a network involving multiple nodes

Types of consensus Algorithms:

- *Proof of work*
- *Proof of Stake*
- *Round Robin*
- *Proof of Authority*
- *Proof of Elapsed Time*

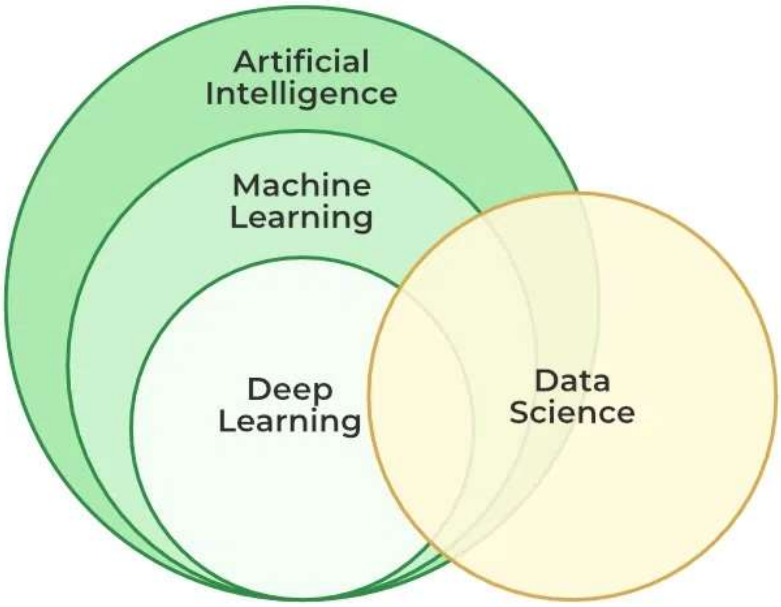
-M. Pranay Kumar Reddy

III year CSE

Deep Learning

What is Deep Learning?

Deep learning is a method in artificial intelligence (AI) that teaches computers to process data in a way that is inspired by the human brain. Deep learning models can recognize complex patterns in pictures, text, sounds, and other data to produce accurate insights and predictions. You can use deep learning methods to automate tasks that typically require human intelligence, such as describing images or transcribing a sound file into text.



Concepts of Deep Learning:

Today Deep learning has become one of the most popular and visible areas of machine learning, due to its success in a variety of applications, such as computer vision, natural language processing, and Reinforcement learning.

Deep learning can be used for supervised, unsupervised as well as reinforcement machine learning. it uses a variety of ways to process these.

Supervised Machine Learning: Supervised machine learning is the machine learning technique in which the neural network learns to make predictions or classify data based on the labeled datasets. the neural network learns to make predictions based on the cost or error that comes from the difference between the predicted and the actual target, this process is known as backpropagation. Deep learning algorithms like Convolutional neural networks, Recurrent neural networks are used for many supervised tasks like image classifications and recognition, sentiment analysis, language translations, etc.

Unsupervised Machine Learning: Unsupervised machine learning is the machine learning technique in which the neural network learns to discover the patterns or to cluster the dataset based on unlabeled datasets. Deep learning algorithms like autoencoders and generative models are used for unsupervised tasks like clustering, dimensionality reduction, and anomaly detection.

Reinforcement Machine Learning*:* Reinforcement Machine Learning is the machine learning technique in which an agent learns to make decisions in an environment to maximize a reward signal. Deep learning can be used to learn policies, or a set of actions, that maximizes the cumulative reward over time. Deep reinforcement learning algorithms like Deep Q networks and Deep Deterministic Policy Gradient (DDPG) are used to reinforce tasks like robotics and game playing etc.

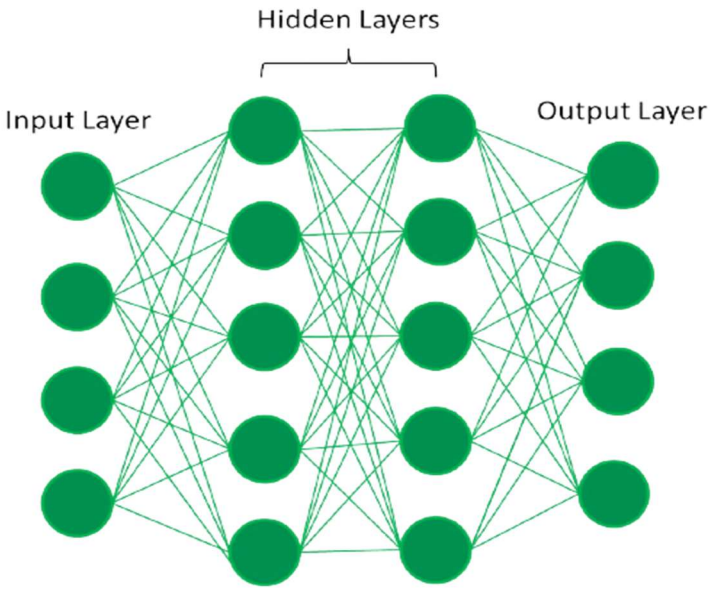
Pillars of Deep Learning

The four pillars of deep learning are

- *artificial neural networks*
- *backpropagation*
- *activation functions*
- *gradient descent*

Artificial neural networks

Artificial neural networks are built on the principles of the structure and operation of human neurons. An artificial neural network's input layer, which is the first layer, receives input from external sources and passes it on to the hidden layer, which is the second layer.. These connections are weighted, which means that the impacts of the inputs from the preceding layer are more or less optimized by giving each input a distinct weight. These weights are then adjusted during the training process to enhance the performance of the model.



Back Propagation

The Backpropagation algorithm looks for the minimum value of the error function in weight space using a technique called the delta rule or gradient descent. The weights that minimize the error function is then considered to be a solution to the learning problem.

Backpropagation Algorithm:

initialize network weights (often small random values)

do

for Each training example named ex

prediction = neural-net-output (network, ex) *// forward pass*

actual = teacher-output(ex)

compute error (prediction - actual) at the output units

compute {display style Delta w_{h}} for all weights from hidden layer to output layer *// backward pass*

compute {display style Delta w_{i}} for all weights from input layer to hidden layer *// backward pass continued*

update network weights *// input layer not modified by error estimate*

until all examples classified correctly or another stopping criterion satisfied

return the network

The Canvas of Courage: A Journey to Unearth Passion

Story

In a bustling city filled with the cacophony of hurried footsteps, honking cars, and distant chatter, there lived a young woman named Maya. Maya had always harbored a deep-seated passion for art, but the demands of a pragmatic society led her to pursue a career in finance, where numbers and spreadsheets replaced the colors and canvases she loved.

As the years passed, Maya's spirit dampened. She felt like a bird with clipped wings, constrained by the rigid expectations of a conventional life. Each day felt like a monotonous repetition of tasks that drained her of the vibrancy she once possessed. Yet, a tiny spark within her refused to be extinguished—a flicker of artistic longing that yearned for expression.

One fateful day, while walking through a bustling art district, Maya stumbled upon a quaint gallery. The vibrant strokes and vivid hues of the paintings spoke to her soul, rekindling the flame that had been suppressed for far too long. A chance encounter with the gallery owner, a wise and elderly artist named Mr. Sullivan, changed the trajectory of Maya's life.

Mr. Sullivan, sensing Maya's unspoken desires, encouraged her to embrace her true calling. He shared stories of his own journey, the struggles he faced, and the ultimate fulfillment he found in pursuing his passion against all odds. Inspired by his words, Maya made a life-altering decision to rediscover her artistic self.

Despite the challenges that lay ahead—financial uncertainties, societal expectations, and self-doubt—Maya enrolled in art classes, dedicating herself to honing her craft. She painted during lunch breaks, sketched during late nights, and immersed herself in a world where her creativity knew no bounds. The more she painted, the more alive she felt, as if each

stroke of the brush was a step toward reclaiming her true identity.

As Maya's art began to blossom, so did her sense of purpose. Her paintings told stories of resilience, self-discovery, and the beauty that could emerge from pursuing one's passions. People were drawn to her work, not just for its aesthetic appeal but for the powerful narratives it conveyed.

Maya's story became an inspiration for others who felt trapped in the monotony of their lives. They witnessed the transformative power of embracing one's true calling and the courage it took to defy societal expectations. The gallery that once showcased Maya's art became a haven for dreamers and a testament to the profound impact of pursuing one's passions.

Moral:

The moral of Maya's story is a reminder that life is too short to be lived on someone else's terms. It encourages us to listen to the whispers of our hearts, follow our passions, and summon the courage to break free from the constraints that stifle our true selves. Maya's journey teaches us that the pursuit of our dreams may be challenging, but the fulfillment it brings is worth every obstacle faced along the way. In the canvas of life, we have the power to paint our own masterpiece, with each brushstroke representing the authentic expression of who we are meant to be.

"In the gallery of life, courage paints the most vibrant strokes on the canvas of our dreams."

Written By: P.Suryanarayana

Effective Facial Feature Extraction Using Local Binary Patterns

Abstract- Imaging in life and materials sciences has become completely digital and this transformation of visual imagery in to mathematical constructs has made it common place for researchers to utilize computers for their day-to-day image analysis tasks. The main objective of the paper is extracting the facial features of an image. In this paper presents a survey on the recent use of Local Binary Patterns (LBPs) for face recognition. It is becoming a popular technique for face representation. In the existed system we are using LBP. It is a non-parametric kernel which summarizes the local special structure of an image and it is invariant to monotonic gray-scale transformations. Here, we describe the LBP technique and different approaches proposed in the literature to represent and to recognize faces but it is having some limitations like it is not suitable for shadow images and low contrasted images. To overcome those problems in this project we are proposing 2D principles of component analysis (2D-pca) to extract the facial features of an image. Here we are using our own data bases to extract the facial features.

I. INTRODUCTION

For any one, from the start of the day involves in plenty of emotions till the end, hence the emotions play a key role in decision making [1]. The emotion is recognized by only with the help of expressions. The person can recognize the expressions by seeing them directly because every emotion has its own expression but person to person a little bit of variation may exist. The system which implements the recognition of the human facial expressions is called facial recognition system. The facial emotion recognition system involves in the following steps: Face Detection, Face Recognition, Face Emotion Recognition system.

II. FACE DETECTION

It determines the locations and sizes of the faces in an input Image. Face detection can be regarded as specific case of object-class detection. In an object class detection, the task is to find the locations and the sizes of all objects in an image that belong to a given Class. Face detection can be regarded as a more general case of face localization. In face localization, the task is to find the locations and sizes of a known number of faces (usually one). In face detection, one does not have this additional information.

Early face-detection algorithms focused on the detection of frontal human faces, whereas newer algorithms attempt to solve the more general and difficult problem of multi-view face detection [3]. That is, the detection of faces that are either rotated along the axis from the face to the observer (in-plan rotation), or rotated along the vertical or left-right axis (out-of-plane rotation), or both. The newer algorithms take into account variations in the image or video by factors such as face appearance, lighting, and pose. Face detection is used in biometrics, often as a part of a facial recognition system. It is also used in HCI and image database management. Face detection is gaining the interest of marketers. Face detection is also being researched in the area of energy conservation [13]. ***An efficient Facial Features extraction Technique for Face Recognition system uses Local Binary Patterns***

Fig: 1 **face detection to determine size & location**

III. FACE RECOGNITION

A recognition system is computer application that automatically identifying or verifying a person from a digital image. One of the ways to do this is by comparing selected facial

features from the image and a facial database. Face recognition accuracy depends heavily on how well the input images have been compensated for pose, illumination and facial expression. The variations of facial appearances caused by illumination, the appearances are classified into four main components: diffuse reflection, specular reflection, attached shadow and cast shadow [4].Variations among images of the same face due to illumination and viewing direction are almost always larger than image variations due to change in face identity.

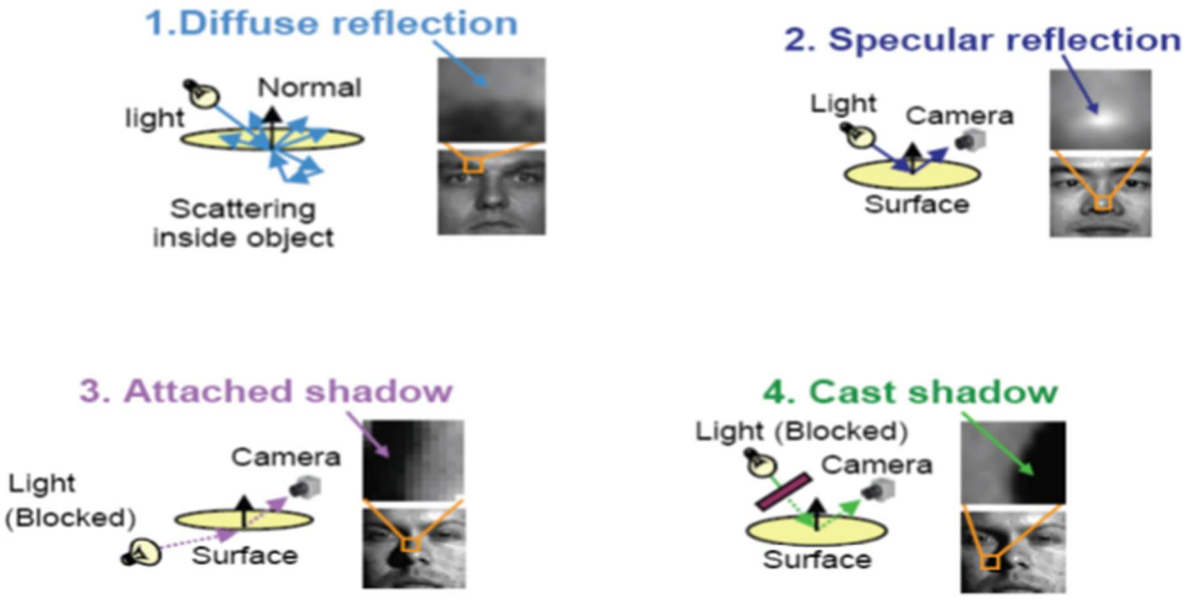


Fig: 2 Face recognition

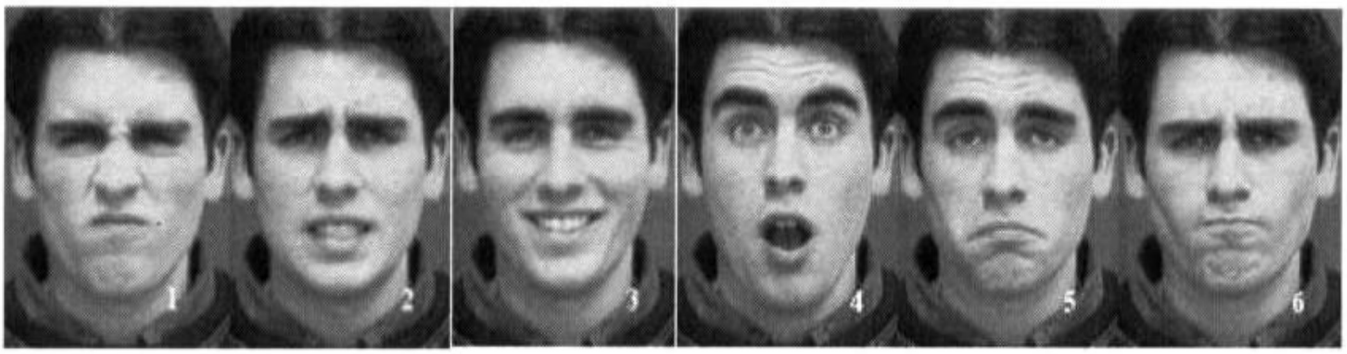
For instance, illumination changes caused by light sources at arbitrary positions and intensities contribute to a significant amount of variability. The image often includes a human face together with a background. Thus, the face has to be extracted from the background

under variety of light

sources called illumination. Some facial recognition algorithms identify facial features by extracting landmarks [9], or features, from an image of the subject's face. These features are then used to search for other images with matching features in this recognition system.

IV. FACIAL EMOTION RECOGNITION SYSTEM

It is a computer system that attempt to automatically analyze and recognize facial emotions. For example, although facial expressions can convey emotions, they can also express intention, cognitive processes, physical effort, or other intra or interpersonal meanings [5]. Some examples of feelings that can be expressed are



Disgust fear Joy Surprise Sadness Anger

Fig: 3 Facial Emotions

V. EXISTED AND PROPOSED SYSTEM

Local Binary Pattern (LBP) is a simple yet very efficient texture operator which labels the

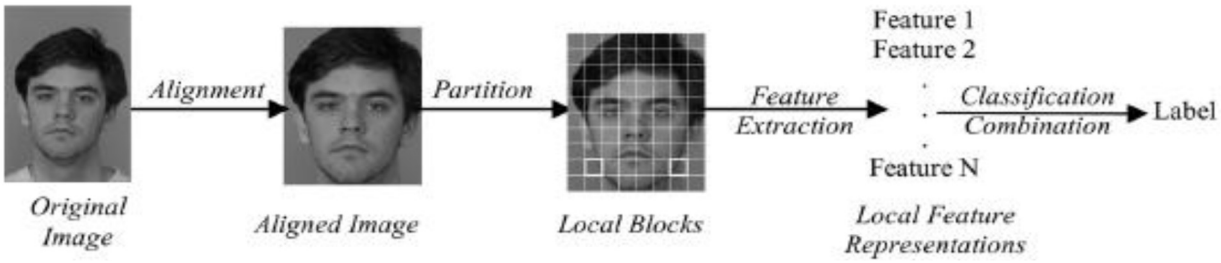


Fig:4 Proposed Methodology

pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number. Due to its discriminative power and computational simplicity, LBP texture operator [6] has become a popular approach in various applications. It can be seen as a unifying approach to the traditionally divergent statistical and structural models of texture analysis. Perhaps the most important property of the LBP operator in real-world applications is its robustness to monotonic gray-scale changes caused, for example, by illumination variations.

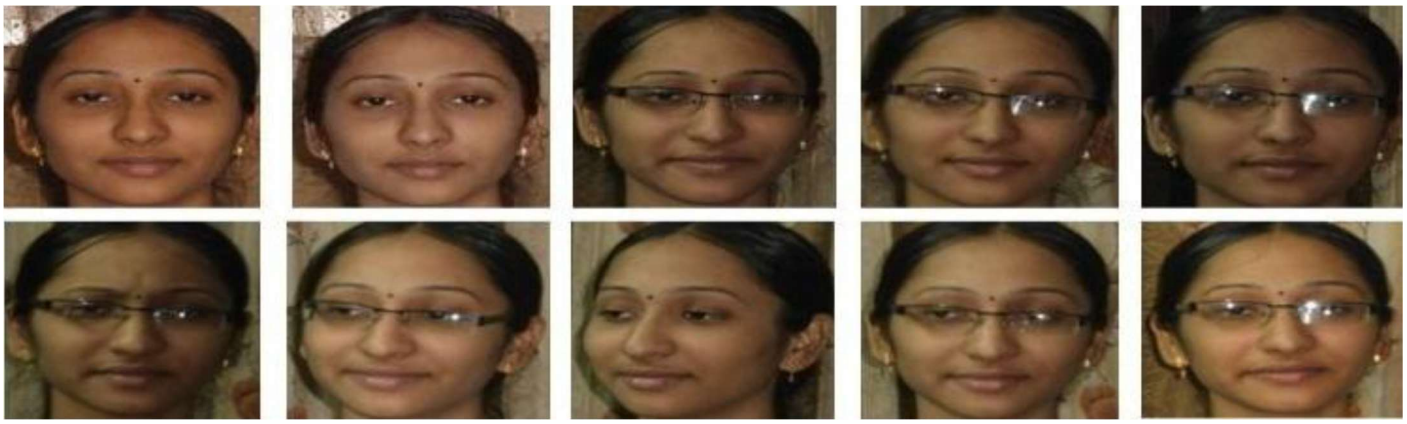
Another important property is its computational simplicity [11], which makes it possible to analyze images in challenging real-time settings. The drawbacks in this system are it is highly sensitive to glasses and it is time consuming process.

To overcome the drawbacks of existing system, a new method is proposed i.e. 2D-PCA (Principal Component Analysis). A kernel **principal component analysis** (PCA) was previously proposed as a nonlinear extension of a PCA. The basic idea is to first map the input space into a feature space via nonlinear mapping and then compute the principal components in that feature space. This article adopts the kernel PCA as a mechanism for extracting facial features. Through adopting a polynomial kernel, the principal components can be computed within the space spanned by high-order correlations of input pixels making up a facial image, thereby producing a good performance.

It is a way of identifying patterns in data, and expressing the data in such a way as to highlight their similarities and differences. The other main advantage of PCA is that once you have found these patterns in the data, and you compress the data, i.e. by reducing the number of dimensions [13], without much loss of information.

VI. EXPERIMENTAL RESULTS

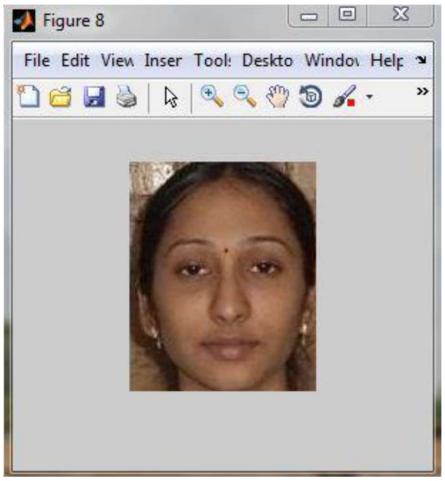
Input images

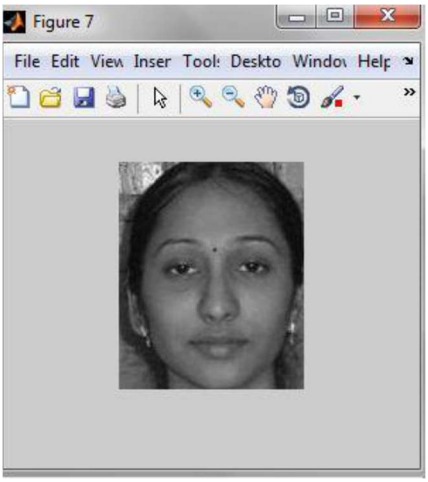


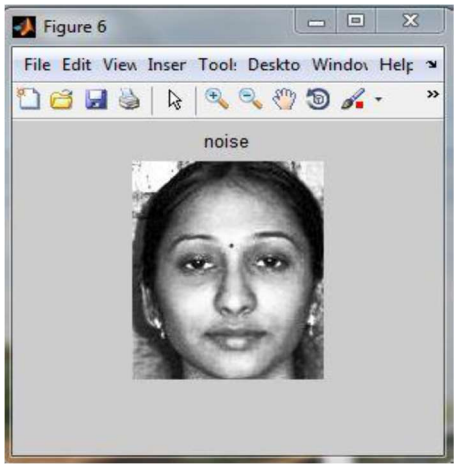
Query image a1

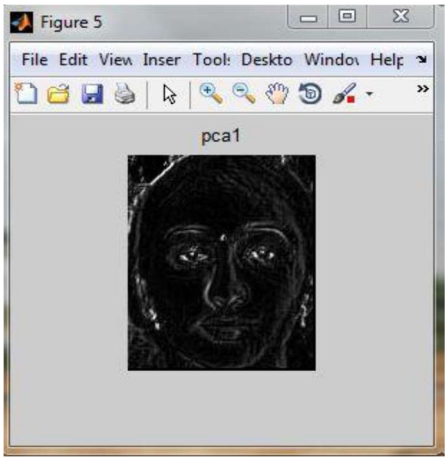
a1 **a2** **a3** **a4** **a5**

a6 **a7** **a8** **a9** **a10**









VII. CONCLUSION AND FUTURE SCOPE

In this project we have taken own database images from a1 to a10. Among those images a1 is taken as query image and the a1 is compared with remaining other images. Here we have applied 3 techniques on these images, they are Original LBP, Extended LBP, Principal Component Analysis. The image a4 is very nearer to query image a1 in pca As per the experimental results if we observe a4 image has glasses whereas a1 image does not have glasses. In case of glasses, the image quality does not change. PCA improves the accuracy of the emotion recognition even in case of experimental results as per the experimental result. The proposed method i.e. Principal Component Analysis also has some limitations like it is time consuming and some important features are missing. To overcome this limitation, we are using Color Filter Array Interpolation Techniques. Edge strength filter output is utilized both to improve the channel interpolation and to improve the quality of image.

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- INVOLVE STUDENTS IN DIFFERENT FORMS OF PEER-LEARNING
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- BRING OUT THE LEADERSHIP SKILLS AMONG INDIVIDUALS BY PROVIDING THEM SUFFICIENT EXPOSURE TO UTILIZE THE SKILLS ACQUIRED.
- HELP STUDENTS RECOGNIZE THE IMPORTANCE OF SMART-WORK & THINKING OUTSIDE THE BOX, THUS INCULCATE CREATIVE THINKING.
- CONTRIBUTE TO ALL ROUND DEVELOPMENT OF INDIVIDUALS THROUGH LEARNING OUTSIDE THE CLASSROOM.