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Contents

A Survey For Medical Image Encryption Techniques in Tele-medicine and E-healthcare

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Abstract—In this pandemic situation, radiological Images are the biggest source of information in healthcare and, at the same time, one of the foremost troublesome sources to analyze. Clinicians now-a-days must depend to a great extent on therapeutic image investigation performed by exhausted radiologists and some of the time analyze and filter themselves. Due to overflow of patients, transmission of these medical data becomes frequent and maintaining confidentiality turns out to be one of the most important aspects of security along with Integrity and availability. Due to varied features of image data, different algorithms are used to protect data from unauthorized access. This paper basically center on the distinctive cryptographic techniques used for the image encryption and decryption of the medical image data within the field of information security. In addition, a comparative analysis is carried out among the parameters used to measure security of the existing literatures.

Keywords—*Information security,Image Encryption,Middle East Respiratory Syndrome (MERS-CoV) , severe acute respiratory illness (SARS-CoV)*

I. INTRODUCTION

Digital medical images are becoming increasingly vital in modern hospitals for detecting and treating diseases, and as a result, they are attracting greater attention.If unauthorised accesses steal, view, or exploit these confidential photographs, disastrous accidents may ensue. A hacker or a rogue database administrator, for example, could utilise the unauthorised photographs for personal gain, such as medical marketing and false insurance claims, posing a life-threatening risk.As a result, safeguarding medical pictures is critical.

Generally, images utilized in bio medical field are treated as delicate data within the bio data frameworks. To transmit these sorts of medical image through network, a secure encryption calculation is required [18], [19], [20]. Researchers have proposed a part of picture encryption calculation for the final few decades. Information Encryption Standard

calculation is most popular algorithm used for encryption which needs minimum time for fetched computations [21], [22], [23], [24]. By applying either symmetric or asymmetric algorithm, a secure image encryption can be exhausted exceptionally viable way[25], [26], [27], [28], [29]. Image encryption is considered exceptionally successful whereas it can give way better result against common attack- known-plain text as well as cipher text attack[30], [31], [32]. In medical image encryption, to upgrade security, Cipher Input Mode is utilized to scramble the image[39], [40], [41], [42]. Many technologies have been developed to safeguard various types of photos, including medical images, up to this point. Among these technologies, encryption is the most intuitive and successful method of transforming images into ones that are not recognised [3], [4].We propose an image encryption technique to overcome the issues with existing medical picture encryption schemes. The well-known substitution-permutation network is used. First, random values are added into the image's surroundings.

In this paper we study some of the methodologies proposed in the recent and a comparative analysis is made among Several techniques depending on the parameters like size of the images, algorithmic techniques that are used and the security parameters (PSNR, SSIM etc) that are used to measure the efficiency of the algorithm.

The remainder of this work is arranged in the following manner. Section 2 introduces the current research for different medical image encryption scheme; Section 3 presents the proposed encryption scheme's simulation results and discusses its properties; Section 4 assesses the comparison of the results for several classical medical image encryption schemes; and Section 5 conclusion of the whole survey work.

II. Literature Survey

Some of the recent contributions on the same field is collected and discussed in the below section.

(Omar.et.al (2021)) [3], the encryption technique proposed for Encrypting chest computed tomography (CT) coronavirus (COVID-19) images into encrypted images to safely transmit real-world data of infected patients. The main point is to obtain integrity and the security of the COVID-19 persistent information employing a modern Hash-based BBS (HBBS) pseudo-random bit generator. This leads to a novel method to create pseudo-random bit-strings in arrange to provide a high level of security based on HBBS generator and hash operations. The proposed method is given to scramble COVID-19CT images to encrypted images for secure actual transmission. Specifically, a secure hash calculation (SHA-256) used to generate a hash value that is used for the agility and haphazardness of freed pseudo-random bits that generate various key streams. In this paper, the key stream bit string generated by the proposed HBBS is used to encrypt four COVID-19 images of chest CT scan, namely 'front', 'lung', 'side' and ' top side. These Images are randomly selected from public data sets [33] these four generic images are of size 256 × 256, with each pixel value representing a number between 0 and 255 at 8 bits. These encryption techniques provide a high level of encryption. Designed to provide secure encrypted data The original and encrypted image is shown in figure 1 using three HBBS keystream values. These entropy values are very similar to the theoretical value = 8, indicating that all encrypted image pixels are likely to occur. As a result, password image data leaks can be ignored and protected from entropy-based attacks.

(Barsha Bose, 2020) [4] This paper proposes encryption of medical images in order to achieve security over insecure network. The medical images of the patient's data are encrypted before transmission and the encryption process involves non-systematic cyclic coding. The work has been performed Cyber attacks in the frequency and spatial domains are also as expected with the results of the unaffected correlation coefficient. The proposed method is suitable for encrypting multiple medical images in the field of very high speed remote care.In this study, medical images was encrypted using the well-known circular coding and convolution coding. In general, there are two types of circular coding: non-systematic and systematic circular coding. They have used unsystematic circular coding. A well-known generator polynomial was selected in the encoding and decoding process. The first selected image was multiplied by the generator polynomial for encryption and decrypted at the receiving end using the reverse process. Their work was mainly in the frequency domain. Therefore, cyber attacks in some spatial domains are ineffective. In the proposed method, the decoding of a particular image depends on the choice of the appropriate generative polynomial. To verify the safety of the tour technique, they applied it to a selective ciphertext attack, which is the method of the very popular cyberattack. The correlation coefficient is one of the effective tools for measuring the effectiveness of image encoding processing. In both cases, the correlation coefficient gives a satisfactory result.

(Arindam Sarkar 2020) [12] This paper addresses the security risks in the use of telehealth during this COVID-
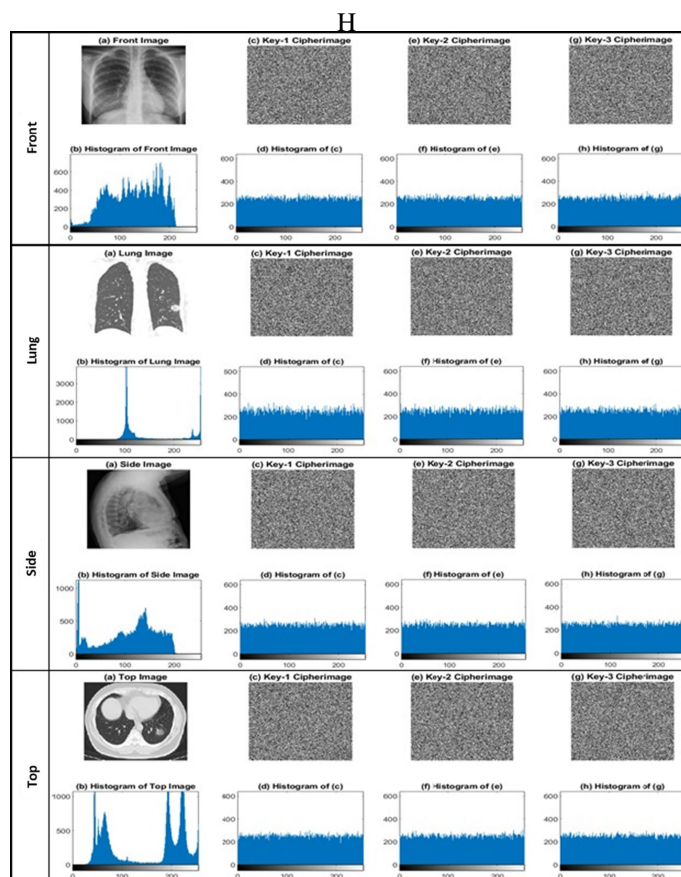

Fig. 1. Histogram of 4 CT normal images and corresponding cipher images. It contains 3 key streams: Key-1, Key-2, Key -3. using the state of the art method [3]

19 pendamic scenario where telehealth plays an important role in e-health.This paper presents a guide to the original secret sharing system, TPM (Tree Parity Machine), for patient privilege-based security sharing. The proposed method produces compelling results showing that this method achieves a high level of protection, reliability, and efficiency and can be compared to existing secret sharing methods. Became clear. This system is a highly secure online information transmission module that can be integrated with all existing telemedicine systems. Analysis of histogram: Histogram analysis was performed in which both initial and encrypted clinical signals were accessed by the proposed program. If this method is successful, it will be displayed as a uniform distribution along with a random histogram of similar values. If the histogram is uniform, the cryptographic algorithm has excellent statistical properties. Figures 2,3 show histograms of general and encrypted information, respectively. Since the histogram of the encrypted information is uniform, the proposed method is robust against histogram-based statistical attacks.

(Xiuli Chai, 2019) [5] This paper provides a new medical image encryption technology that combines Latin Square and a chaos system. A permutation and diffusion architecture is adopted. Using Latin rectangles and general image information to provide general images and permutations based on Latin squares (PPILS), mixing general image pixels into other rows and columns for strong correlation between adjacent
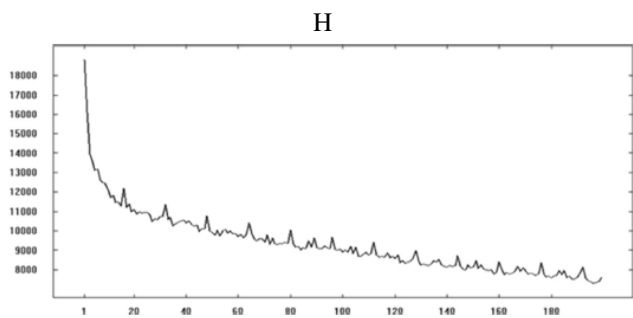
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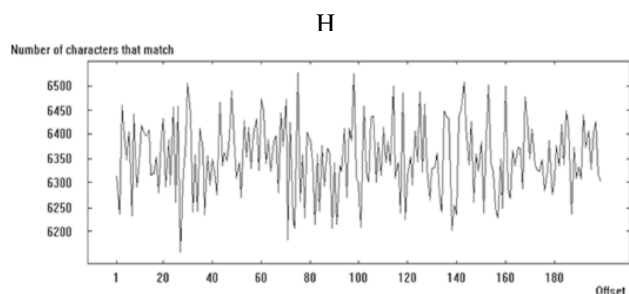Fig. 2. Autocorrelation of the plaintext signal using using the state of the art method [11]

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Fig. 3. Autocorrelation of the encrypted signal using using the state of the art method [11]

pixels It effectively weakens the relationship and makes the other images different. Permutation effect. To enhance the effectiveness of encryption, we propose bidirectional adaptive diffusion with little change in the normal image over the pixels of the encrypted image. Since the chaos sequences used for permutation and diffusion are generated by the 4D memristive chaos system and the initial values are calculated with the SHA 256 hash value of a normal image, the proposed algorithm is known general text and can withstand selective permutation attacks.

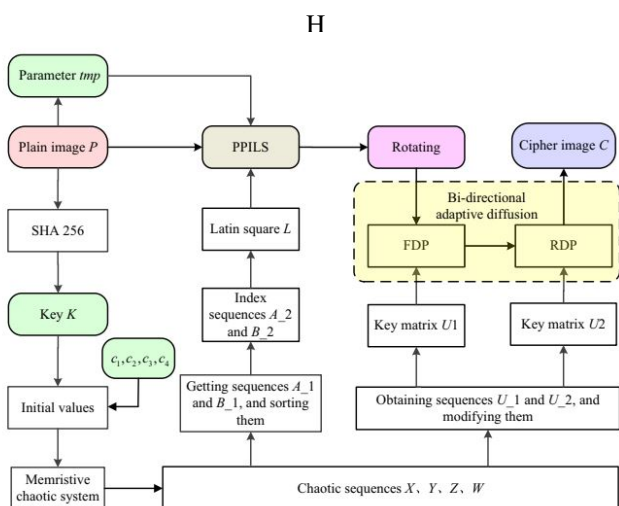The flowchart of the proposed encryption algorithm

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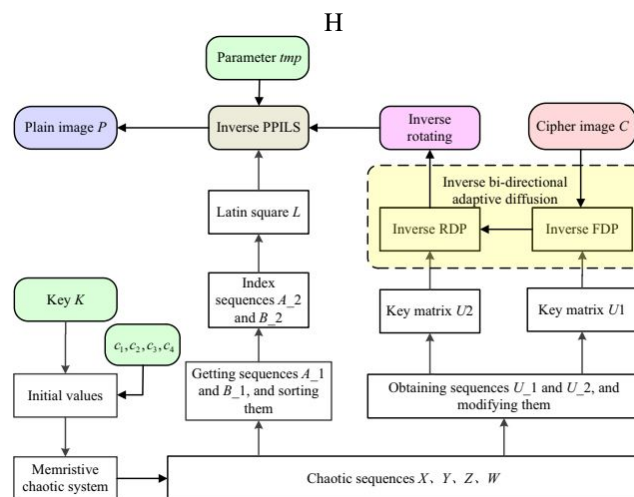Fig. 4. Autocorrelation of the plaintext signal using using the state of the art method [11]

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Fig. 5. Autocorrelation of the encrypted signal using using the state of the art method [11]

in [5] is shown in Figure 6 For the general image, first mix the general image with in a permutation based on Latin Square (PPILS), then rotate the permutation image 180 degrees clockwise to the next bi-direction adaptive diffusion. Is to change the pixel value in order to generate the encrypted image.of each step in the encryption process. Before decryption, the secret key K, parameter c1, c2, c3, c4, tmp should be sent to the receiver through the secure communication channel. The decryption process is illustrated in Figure 5

Xiaoyi Zhou,2021 [8] This paper mainly focuses on the security issues which have increased due to the increasing demand of the Telemedicine during this COVID-19 period. This paper proposes novel Reversible watermarking (RRW) algorithm based on the discrete wavelet transform to remove the limitations over embedded capacity, robustness and imperceptibility. The author explains the principle of reversibility using the Haar wavelet transform and discusses the use of some Zernike moment coefficients for image correction. they elaborated the steps of embedding and extracting in the robust reversible watermarking scheme and presents the experimental results of this scheme for watermark reversibility, robustness, imperceptibility, and embedding capacity. The proposed methodology is capable of preventing common and geometric attacks. Despite of having high embedding capacity, the algorithm is able to produce distortion free images. The paper contributes towards improving the security of medical images in tele-medicine and e-healthcare.

(Fares Kahlessenane, 2020) [10] The paper proposes a blind and robust approach in the field of Telemedicine and e-health care. The strategy comprises of the patient's information which are embedded with the image acquisition data. The clinical reading for both the original image and the watermarked image should be similar and the whole experiment has been accomplished in frequency domain. As a result spatial domain attacks can be avoided. The four transforms are utilized in their experiment 1. Discrete wavelets transform. .2. Non-subsampled Contourlet transform 3. Non-subsampled
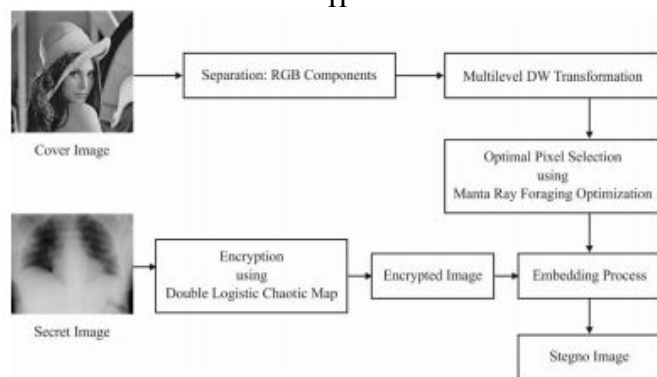
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Fig. 6.   Block diagram of the EIS-SDT model proposed in [44]

shearlet transform. 4. Discreet cosine transform. Further, Schur decomposition was combined with these four transform and the watermark bits were integrated in the upper triangular matrix.

(V. Pavithra, 2018) [2] This paper presents an investigation into the encryption technology used in medical imaging. In this paper, we introduce a comparative study of medical image encryption and expand the scene that is obvious to researchers by examining various existing statistics such as PSNR (maximum signal-to-noise ratio) and MSE (mean squared error). Encryption technology for medical images. This includes analyzing the security level, requirements, and purpose of medical image encryption. This investigation is helpful for researchers comparing the various cryptographic techniques implemented so far.

(Subhaluxmi Sahoo, 2020) In this paper, the author proposed a methodology in the spatial domain where COVID-19 X-Ray images are experimented [43]. In this approach, Dual Encryption is employed on the input Image data in addition with the generation of the Baconian Ciphers by using Encrypted DNA technique. This data was then inserted into the LSB of the image using logical operations. The insertion was performed in the LSB window of the image with the lowest average intensity. The final image is then reconstructed in the bit plane. The author has used Normalized Cross relation (NCC), Root Mean Square difference (RMD), and Average Difference (AD) for analysing the correlation between the original and the cipher image.

(Sultan Alkhliwi, 2021) [44]This paper proposes a novel encryption technique keeping an eye to achieve a secured data Transmission in this COVID-19 pendamic situation. The encryption process involves image steganography model(EIS-SDT) using a multilevel discrete wavelet transform. Further, Manta Ray Foraging Optimization (MRFO) algorithm has been employed for optimal pixel selection. To gain additional level of security, Double Logistic Chaotic map is used in the EIS-SDT model. Performance analysis like MSE and PSNR are used to measure the security of the proposed algorithm. Figure 6 shows the workflow included in the EISSDT model. Initially, the cover image is decomposed using a multi-level DWT, and the optimal pixel is selected by the MRFO algorithm. In addition, the secret image is encrypted by applying the DLCM model. The resulting Stego image reconstruction process is reversibly transferred to different hospitals.

III.   Results Comparison

The various parameters used in different literature are taken into considerations to create the Table 1. The main factors of comparisons are Size of the image/Signals, the strategy or algorithms used and the security parameters those are used to quantify the strength of the algorithms. The primary aim of most of the literature are to provide algorithms which are robust, secured even in unsecured network and preserving quality of the images throughout the encryption and decryption process. So for evaluating the image with these factors, the different metrics used in some of the literature are illustrated in the table 1.

IV.   Conclusion

Due to the on rise demand of the transmission of the patient's data over network, it is very much important to study the encryption techniques that can be used in this pandemic situation to ensure not only the security but also time-effectiveness. In medical imaging apart from security, data integrity also plays a vital role as chance of data loss is always there during Encryption and decryption process and as a result it may lead to false diagnosis of the patient. In this paper, a detailed review is discussed of the encryption techniques which involve COVID-19 medical images and the various information accompanying it.

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TABLE I.   COMPARISON ANALYSIS AMONG 6 STATE OF THE ART METHODS BASED ON SIZE OF IMAGE AND SECURITY PARAMETERS LIKE PSNR , MSE, UACI ETC.

References	Author	Image size	Algorithm used	Security parameters
[3]	Omar et al.	256 X 256	BBS	Correlation coefficient, Entropy, PSNR, MSE, NPCR, UACI
[4]	Barsa.et.al	512 X 512	Non Systematic Cyclic coding	Correlation coefficient, PSNR
[12]	Arindam Sarkar,2020			Correlation, Information Entropy
[5]	Xiuli Chai 2019	256 × 256, 512 × 512, 400 × 400	Permutation based on plain image and Latin square (PPILS)	Correlation coefficient, Histogram Analysis, NPCR, UACI
[8]	Xiaoyi Zhou,2021	512 × 512	Novel Reversible watermarking (RRW)	MSE,PSNR
[10]	Fares Kahlessenane, 2020	1024 × 1024	Blind and Robust Approach	PSNR, SSIM,NVC,STD,NCC
[43]	Subhaluxmi Sahoo, 2020	352x262,352x288,348x288, 334x288,337x288	DNA based Double Encryption Technique	Normalized cross-correlation (NCC), Root mean square difference (RMD), and Average difference (AD)
[44]	Alkhliwi, 2021		EIS-SDT	PSNR, MSE

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"Moodify"– Listen To Music Based On Your Mood

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Abstract

It is regularly confounding for individuals to choose which music they need to tune in from a monstrous assortment of existing choices. There have been a few systems accessible for music, eating, and relying on the state of one's mind. The fundamental goal of our music proposal framework is - to give ideas to the clients that fit the client's inclinations. The investigation of the look/client feeling might prompt understanding the current enthusiastic or psychological condition of the consumer. Music is one locale with a vast opportunity to endorse bountiful decisions to customers considering their tendencies and recorded data. By fostering a suggestion framework, it could help a client settle on a choice in regards to which music one ought to pay attention to, assisting the client with decreasing their feelings of anxiety. The client would not need to burn through any time in looking or to turn upward for tunes. The best match of the song according to the client's mindset is identified, and tunes would be displayed to the client as indicated by their state of mind. The client's image is taken, and afterwards, according to the state of mind/feeling of the client, a proper melody from the selected list of the music is shown, which matches the client's prerequisite.

Keywords.
Music System,Neural Networks, Image Processing, Face-recognition

1. Introduction

Individuals will often express their feelings fundamentally by their facial expressions. Music has been the time known to adjust the temperament of a person.

Catching and perceiving the feeling being voiced by individual and showing suitable tunes matching the one's mindset can progressively quiet a client's brain and generally wind up giving a satisfying impact. The project

expects to catch the feeling communicated by an individual through facial expressions. A music player is intended to catch human feeling through the web camera interface accessible on processing frameworks.

The task expects to ease up the state of mind of the client by playing melodies that match the necessities of the client by catching the picture of the client. Since time unknown, the best type of demeanor examination known to humanity is looking acknowledgement. The ideal way individuals will generally investigate or finish up the feeling or the inclination, or the musings that another individual is attempting to communicate is by look. At times, temperament modification may likewise help beat circumstances like despondency and pity. With the guide of articulation examination, numerous well-being dangers can be kept away from, and there can be steps taken that help carries the state of mind of a client to a superior stage. Facial expressions are significant in working with human correspondence and collaborations. Additionally, they are an essential instrument in social examinations and clinical recovery.

2. Literature Survey

Ekman and Friesen[1] fostered the expression of facial activity coding framework (FACS) to quantify mood conduct. These codes of FACS distinctive the facial developments right into the Action Units (AU) in light of basic solid actions, which produce quick swaps of the look. A reaction is perceived correctly through analyzing the AU or amalgamation of action units related to a particular response.

Various other researchers [2–10] have already been involved in the neuronal organizations for the mood arrangement. This presentation of the neuronal organization relies upon a few variables, including the underlying irregular loads, the preparation information; the enactment work utilized, that organization's construction along with the quantity of stowed away surface neurons, and so forth.

Reddy and Buch [11], Das et al. [12], Gopinath and Reddy [13], Srirao et al. [14] and Reddy et al. [15] fostered those idea concerningneuronal council organizations wherein countless organizations are prepared. It is dependent on the embryonic testing with the data gained from the topic, which are not used in training, and hardly networks are enlisted into a conference. From the issues which are not used in training or in embryonic testing, the final or last assessment of the conference is managed with the data gained.

3. Problem Statement

The work is all about detecting the face from a given image and predicting their emotions. As different

faces will have different emotions attached with it. Hence, authors have proposed respective songs for each detected mood, which helps them light up their mood.

4. Methodology

4.1 Algorithm – Pseudocode

1. Start.
2. Unzipping training dataset for Emotion Recognition.
3. Import the dataset.
4. Import numpy,pandas, and matplotlib libraries &Keras.
5. Working a with pre-trained model.
6. Initialize base model to input-shape of img (224, 224,3) and include top= false
7. Import mode 2 to use functional API
8. Use Dense, to take different layers here. Dense units =7, i.e., 7 layers into model. Or 7 emotions.
9. Training Model for loss & Accuracy.
10. Given, Zoom_range = 0.2, shear range=0.2, rescale= 1./285,Horizontal_flip = True.
11. Import train model to the directory with tanget_size=(224,224) Batch Size = 32 (tells how many times it is going to run the cycle).
12. Use Keras inbuilt function for generating images from run dataset. Use "Image Data Generator" for validating the model. Label& plot the images with different emotions.
13. Check for Early stopping & model check point, Use "Epoch" same as "Batch Size".
14. Load the best fit model or "h5 model".
15. Check Accuracy & Loss of the model through plotting. Lesser the difference between Accuracy of ValAccuracy, moreStable will be the model, Same for loss.
16. Now time to map the Output Values.
17. Give the image path (downloaded image). and. the list of songs. Check for Emotion of image & play the song respectively.
18. END

4.2 Flowchart of the Moodify
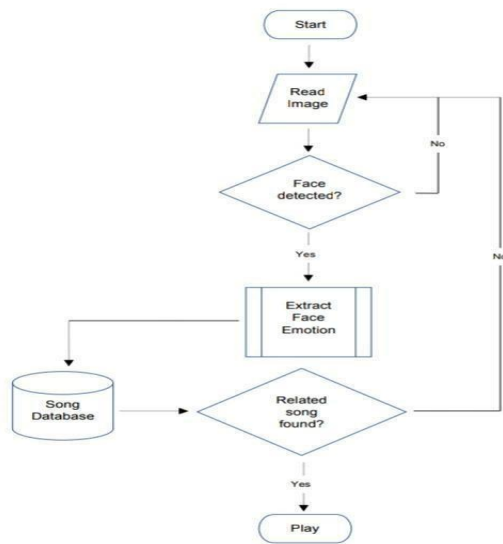
**Figure 1: Flowchart of how Moodify works**

4.3 LIBRARIES USED

Pandas - which is a python library for data analysis
Numpy - which is a library to be used for arrays or matrices.
Keras - is a open source software library that provides an interface to work with neural networks.
 Matplotlib – used as plotting library for the python programming language

5. RESULT AND ANALYSIS

5.1 ACCURACY AND LOSS ANALYSIS:
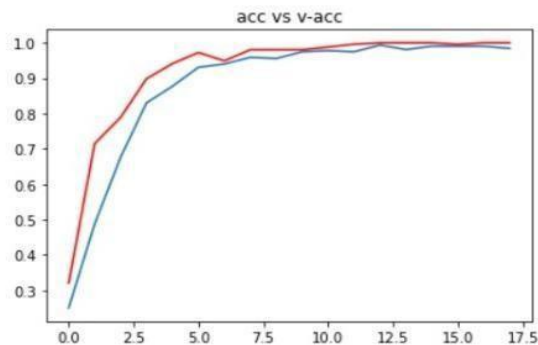
Figure 2: Graph of accuracy versus validate accuracy.
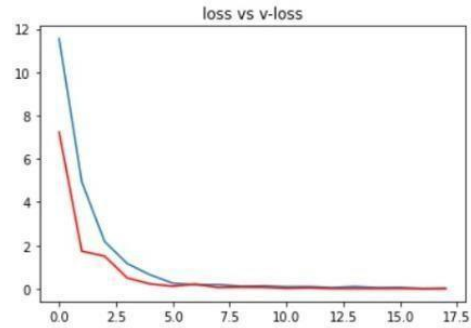
Figure 3: Graph of loss versus validate loss.

Modify software can recognize mood by using a face detection algorithm. Usually we find the distance between the forehead and chin or length between nose and lips, which leads to detecting the facial points using artificial neural networks. Here songs are already given in a database for different moods.
The result: This software can get your facial signature, and then it can play songs as per your mood.

6. Conclusion

6.1 Limitation and Advantages of Facial Expressions Detection

As we know, technology has both benefits and disadvantages. Among them, a few advantages of facial recognition are speed, ease, quality, and the fact that it is fraud-proof. On the other hand, the disadvantages include the chances of misreading one's appearance. Any significant difference in physical appearance will change the technology's ability to distinguish the face accurately. Although facial recognition is an upcoming and demanding field, it is yet perfected to have more designs. Also, the fear for privacy must be one of the main factors of improvement, as ethics play an enormous role in the implementation part.

Detecting emotions by facial recognition has become one of the significant subjects of exploration and has accumulated a lot of consideration before. It is seen that the issue of emotion detection with the help of image processing calculations has been expanding step by step. Specialists are ceaselessly dealing with ways of settling this with the help of various types of highlights and image processing strategies. The uses of image processing calculations in both clinical science and human science are vital.

Constantly new ways and techniques are being created which utilize image processing calculations to get the Emotion of the client and with the help of the extracted Emotion to treat the client. Emotion recognition has acquired a ton of significance in all walks of life and assuming a robust calculation carried out which can precisely characterize the emotions of the individual, then, at that point, a lot of progression in the business can be accomplished with the assistance of this. The framework has effectively had the option to catch the Emotion of a client. It has been tried in a continuous climate for this predicate. It must be tested in various lighting conditions to decide the vigour of the created framework. The framework has likewise had the option to get the new pictures of the client what's more fittingly updating its classifier and preparing dataset. The framework was planned to utilize the facial tourist spots plot and was tried under different situations for the outcome that would be gotten. It is seen that the classifier has an exactness of more than 80% for the majority of the experiments, which is very great precision as far as emotion order. Likewise, it is seen that the classifier can precisely anticipate the client's statement in a continuous situation when tried live for a client.

6.2 Future Scope
• We can use OpenCV for detecting faces utilizing the webcam.
• We can create front end architecture for giving it an exciting outlook
• This can be treated as primary Medicare for any little distressed people.

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Desktop Voice Assistant Using Artificial Intelligence

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Abstract

To make calls, send emails and texts, search things online, give directions, fold and unfold apps, set appointments on our calendars, and initiate or complete various tasks. For those in the e-Commerce industry, there is a great way to thrill customers, by providing them with the ease of online shopping on any device using voice assistant technology-enabled chatbots.Sometimes consumers requires assistant at odd hours, but it's not possible to send them such assistance physically. At these situations, the virtual voice assistants help a lot by solving the problems of the consumers. While interacting with people or with some organization online, most people have to deal with language barriers. Personal assistant technology integrated with automatic translation helps to break the language barrier. Artificial intelligence assistant technology helps your business or start-up to up to date

regular operations. Things such as remembering important appointments, deadlines, arrangement etc. can be all triggered using specific voice commands. AI is capable of picking up teasing indications required to combine the data and give results at a moment's notice. Moreover, the voice feature frees up your arms so that we can complete tasks simultaneously. The car voice assistant experience has enabled drivers to have a safe hands-free experience: making and receiving phone calls, managing music, and navigation, taking out orders, booking services, and scheduling appointments. Voice assistant helps disabled persons (like persons who have issues with upper limb mobility or eyesight) to perform various tasks. Recruiting a personal voice assistant gives you enough time to alleviate, take a check and get a grip on your life by finding balance. Once you embark on an enterprising venture family time is restricted to those occasional family trips. Get ample amount of time every day to sit at the dinner table and have a proper conversation with your family by hiring a virtual voice assistant.

KEYWORDS: Artificial Intelligence, Python, VS Code, Voice desktop Assistant, **Pyttsx3** Libraries.

I. Introduction

Anything that makes a machine act more intelligently can be called Augmented Intelligence or Artificial intelligence. AI should not attempt to replace human experts, but rather extend human capabilities and accomplish tasks that neither humans nor machines could do on their own. Keeping this objective of Augmented intelligence or Artificial Intelligence, one of the best things that are created to extend the capabilities of a human being is known as a Virtual voice assistant that can be present on the desktop, mobile phone or can be used as a different device.

A virtual voice assistant using AI is an application program that understands natural language voice commands and completes tasks for the user. Google Assistant or Alexa can be considered the most famous application of virtual voice assistant.

II. LITERATURE SURVEY

The history of AI contains different and various periods, like-the Maturation of Artificial Intelligence (1943-1952), The boom of AI (1980-1987), and The emergence of intelligent agents (1993-2011). So, The phases start with the maturation period of AI.

The year 1943: The first work which is now recognized as AI was done by Warren McCulloch and Walter pits in 1943. They proposed a model of artificial neurons. Year 1949: Donald Hebb demonstrated an updating rule for modifying the connection strength between neurons. His rule is now called Hebbian learning. Year 1950: The Alan Turing who was an English mathematician and pioneered Machine learning in 1950. Alan Turing publishes "Computing Machinery and Intelligence" in which he proposed a test. The test can check the machine's ability to exhibit intelligent behaviour equivalent to human intelligence, called a Turing test. Then there comes the golden years which were filled with Early enthusiasm (1956-1974). The year 1966: The researchers emphasized developing algorithms which can solve mathematical problems. Joseph Weizenbaum created the first chatbot in 1966, which was named ELIZA. The year 1972: The first intelligent humanoid robot was built in Japan which was named WABOT-1

Then there happened a boom of AI (1980-1987)Year 1980: After AI winter duration, AI came back with "Expert System". Expert systems were programmed that emulate the decision-making ability of a human expert. In the Year 1980, the first national conference of the American Association of Artificial Intelligence was held at Stanford University. After that the emergence of intelligent agents (1993-2011) were invented.Year 1997: In the year 1997, IBM Deep Blue beats world chess champion, Gary Kasparov, and became the first computer to beat a world chess champion.Year 2002: for the first time, AI entered the home in the form of Roomba, a vacuum cleaner. Year 2006: AI came in the Business

world till the year 2006. Companies like Facebook, Twitter, and Netflix also started using AI. Then there started a new era of artificial intelligence with the invention of Deep learning, big data and artificial general intelligence (2011-present) Year 2011: In the year 2011, IBM's Watson won jeopardy, a quiz show, where it had to solve the complex questions as well as riddles. Watson had proved that it could understand natural language and can solve tricky questions quickly. Year 2012: Google has launched an Android app feature "Google now", which was able to provide information to the user as a prediction. Year 2014: In the year 2014, Chatbot "Eugene Goostman" won a competition in the infamous "Turing test." Year 2018: The "Project Debater" from IBM debated on complex topics with two master debaters and also performed extremely well.

[1] Most of the scientists believe that an intelligent system is not capable of representing human emotions like love or hate, and on the second thought there is also no need for a system to willfully become generous or vengeful. Following are the ways to discuss the above statement-

1. AI systems that are programmed to destroy human lives i.e. Autonomous arms. If the wrong persons get their hands on these kinds of weapons then they would be able to cause mass mortalities easily.
2. An AI weapon race will hastily head towards an AI war that is also going to head towards mass mortalities. Well, in order to pilot clear of the thought of being captured by the enemies, these weapons are programmed to be extremely difficult to simply turn off, and that is the reason why human beings are most likely to lose control of such a situation.
3. The second type of case happens whenever we fail to properly orient the AI's goal with ours, which is richly labourious. If you ask a well trained intelligent car to take you to a particular destination as fast as it can, then it might get you there doing literally what you have asked for. If a super intelligent system is tasked with an ambitious geoengineering

project, it might create destruction in our ecosystem.
4. Now as we discussed the above two scenarios, we can say that our concern for the advanced AI isn't avenging but capacity.
5. A striking well informed AI system will be exceptionally satisfying at performing its goals but we do have to align those goals with ours

[2] The ultimate goal is to keep the concussion of Artificial Intelligence in favor to the society which in turn results in triggering the research in many areas like control and security, validation and verification and even also law and economics. Following are the points to justify the above statement-

1. Let's just assume that a system gets crashed down then it will be hard to explain. Now, when it comes to an AI system it becomes really important that the intelligent system does what we have asked it to do specially when it comes to systems lie vehicles such cars, airplane or a power grid or an automated trading system or may be a pacemaker.

2. One of the major short length challenges in order to maintain the safety is to take provision from an Arms Race in Lethal Autonomous Weapons.

3. On the other hand, when we consider the long term impact, a magnificent question arrives that if we succeed in the chase of strong Artificial Intelligence and if an AI becomes more sophisticated than humans could not be able to think what will happen.

4. In 1965 I.J. Good pointed that conniving a wise intelligent system is itself a challenging task. The achievement of such systems could result in provoking an intelligence detonation which will leave the human intelligence way too far behind.

5. By designing radical latest technologies, and thus produced super intelligent system might be able to help us wipe out poverty, disease or may be even war. But so the creation of such a strong AI system might also be the last, until and unless we learn to align our goals with that of the Artificial Intelligence.

6. Now as we know that an AI has the capability to turn into more intellectual than any human ever, we cant predict how its going to behave. We wont be able to use previous developments in technologies because of the ability to outsmart us willingly or unwillingly.

III. PROBLEM STATEMENT

[6]There are many individuals around us who uses desktop, laptop and other devices. But

1. Many of them are suffering from problems like- some of them have issues with upper limb mobility. It's difficult for them to complete tasks on the desktop without any assistance.

2 [3]There are people who have very poor eyesight, Visual Impairment which is a barrier for them because for this they can't type in the keyboard properly.

3. [4]People with acquired brain injury and autism spectrum disorder are not able to type properly to fulfil their requirements

4. While [7]travelling abroad, while interacting with different people as well as organizations online, most people have to deal with language barriers just because the language and culture may differ from one place to another.

5. People with spinal cord injury [8](SCI) and Muscular dystrophy are not able to accomplish their tasks in desktops or laptops without assistance.

So, these are the real life problems faced by many people around us.

IV. Proposed solution

A proposed solution is an important communication tool because it examines an issue from multiple angles. Here is a solution proposed by us to solve all those real-life problems.

In the above-mentioned problem, all the people who are mostly suffering from different kinds of disabilities are our main focus. As it's not possible for them to operate a desktop or laptop without any assistance, that assistance can be physical or virtual.

So, to solve this kind of problem, we have created a virtual desktop assistant using Artificial Intelligence. This desktop assistant works based on the given voice commands. That means it must contain speech recognition technology. Since speech recognition technology uses the spoken word as its motive power, it can be of extra benefit for those disabled persons to some extent. They can use their personalized desktop voice assistant which will accomplish the tasks given in their own language.

V. Result

[9]So, we have made our personalized A.I based desktop voice assistant using python. There are the following steps we have followed while creating the assistant.

- The first step is opening a Python interpreter. Anyone can use any kind of interpreter, but we used VS Code.
- Install different libraries, some were default libraries, but some were not. Install and import them. [5]The first such library was pyttsx3, it's a library that will help us to convert text to speech. In short, it is a text-to-speech library.
- Use Microsoft-developed speech API- which is SAPI5.
- Write speak() function to convert text to speech. After that create a main() function, and inside this main() Function call speak function.

- Now, we will make a wishme() function that will make the assistant wish or greet the user according to the time of computer or pc. To show the right time, import a module called datetime which is inbuilt library.
- Define take command(), With the help of the takeCommand() function, the A.I. assistant will return a string output by taking microphone input from the user.
- Then we started defining the tasks for the assistant. The tasks we included in it are- searching Wikipedia, opening google, opening youtube, and telling us the right time.

Input-
" *Good Morning. Hello I am Ritu.*
How may I help you?
Listening…
Recognizing…
User Said: Show me the time
Output- The assistant speaks- "It's 11 hours 30 minutes 42 seconds."

VI. Conclusion

This system is designed in such a way that the user can accommodate it in an effortless manner. Our proposed solution – Ritu: The desktop voice assistant using Artificial intelligence using a speech recognition system makes the whole process more secure and more user-friendly. Voice control applications enhancement to all applications running on a system by synthesizing commands set by the user.

Speech recognition technology is a key technology which will provide a new way of human interaction with machines or tools. The advantage of voice commands over advanced devices saves time by pointing to the correct search. The sending of Emails and reading of News can be possible by blind people also. This can do a variety of tasks like tell you the time, open applications, organized files, can give

updates of matches, play game, tell you the location, open hackathons on google .com, do calculations, and updates about the news via Wikipedia and the endless tasks for the user.

Thus making one's life comfortable and at the same time remotely accessible via voice commands.

VII. Future of cyber security

1. [10]Using Artificial Intelligence and the android app development system this project can be compiled into an easy-to-use application. So that with one touch people can use the assistant to solve their problems.
2. In this project we will expand the features of social media for the young generation.
3. Using voice authentication technology the application will provide more security to your device as well as your personal information such that your password, texts, bank details etc.
4. Further adding face authentication technology will be a more secure and more robust overdue time of course.
5. Adding databases such as MongoDB, etc will reduce the no. of lines of codes so that future developers can access it more efficiently.

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Modern Attendance System - A New Way For Taking Attendance by Face Recognition

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1 Abstract

In this digital era, face recognition system plays a vital role in almost every sector. Face recognition is one of the mostly used biometrics. It can used for security, authentication, identification, and has got many more advan- tages. Despite of having low accuracy when compared to iris recognition and fingerprint recognition, it is being widely used due to its contactless and non-invasive process. Furthermore, face recognition system can also be used for attendance marking in schools, colleges, offices, etc. This system aims to build a class attendance system which uses the concept of face recognition as existing manual attendance system is time consuming and problematic to maintain. And there may be chances of proxy attendance. Thus, the need for this system increases. Faces are detected and recognized from a camera placed inside the classroom.

1.1 Keywords
Deep Learning, Face Recognition, Face Detection, Attendance system.

2 Introduction

Face recognition is the process of identifying an individual based on their facial features. Such a system can be used in photos or videos, or in real-time machines. The objective of the present study is to provide a simple and easy method in machine technologies. With the help of this technique one can easily detect the faces by the help of datasets in similar matching appear- ances of a person. The present method is useful in many areas such as the military, security, schools, colleges, and universities, airlines, banks, online web applications, and gaming etc. This system utilizes powerful Python algorithms through which the detection and identification of faces is very easy and efficient. [1]
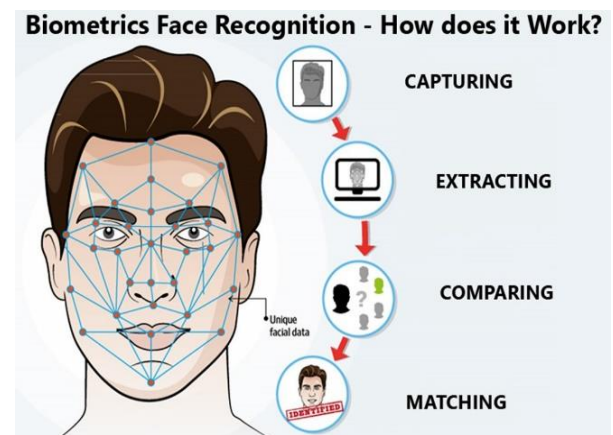

2.1 Problem Statement
The existing attendance system requires students to login to the Attendance website every time they attend a class. This includes the more time consumed by the students to login in to the site, Write the attendance code, fill up the form and sometimes it's possible that due to network issue the student couldn't fill up the attendance. For avoiding this problem, we have developed a Face Recognition Attendance system.

3 Literature survey
In this Project, the idea of two technologies namely Student Attendance and Face Recognition system has been implemented with a machine learning ap- proach. This system detects the student's face and maintains the student's attendance. Therefore, the attendance of the student can be made available by recognizing the face. On recognizing, the attendance details are

obtained in a separate file.
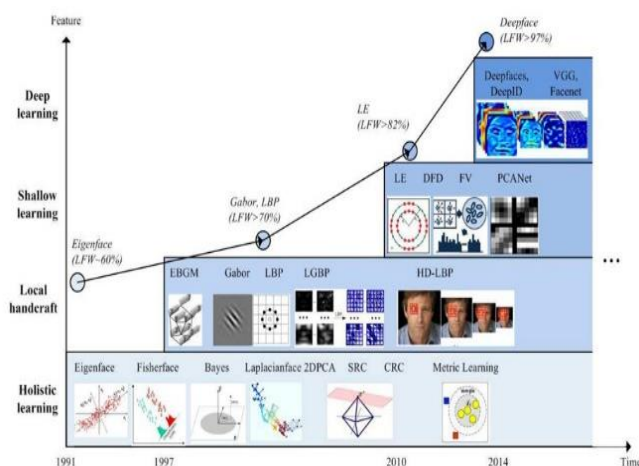
4 Methodologies

Deep learning evolved recently in the process of the understanding, systems. Hence, deep learning along with the facial recognition, together work as deep metric learning systems. In short, deep learning in facial detection and recognition will broadly work on two areas the first being accepting the solidary input image or any other relevant pictures and the second, being given the best outputs or the result of the images of the pictures. We would be using dlib face recognition framework that would be the easy and simple way to organize the face evaluation. The two main significant libraries used into the system are dlib and face recognition. Python being a very powerful programming language and one of the programming languages that is being used all over the world has proven to provide best results in the face recognition and detection systems. Together face recognition and detection becomes very easy and productive with the help of python. [2]

4.1 Need of an automated system

Due to the rising demand for the systems that can help in the areas of surveillance as well as security, this type of individual authentication can no more be done using simple handmade techniques hence there is a rising requirement of the automated systems that could easily rectify the faults as well as process the human face recognition in an efficient manner. When the work is performed by machines, it can perform tasks efficiently within very less duration of time thus cutting off the major mistakes occurred due to manual processing. A real time based facial recognition system built can ease the work of face detection and could be achieved in various ways.

5 Conclusion

Face recognition work is currently made easier by the association of face recognition systems with numerous, leading technical enterprises and sectors. It is a simpler and more practical instrument or system that can be created by anyone in accordance with their requirements thanks to the usage of Python programming, OpenCV, and face-recognition. The user-friendly and cost-effective method that is proposed in this project will be helpful to many people. Therefore, the face recognition system can be created for a variety of purposes by using Python,OpenCV and face-recognition. [3]

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UTILIZATION OF THREE.JS AND UNITY TO MAKE A WEBGL API TO PERFORM 3D IMMERSIVENESS IN WEB

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Abstract

Hats off to Prometheus, who stole fire from heaven. From fire to WebGL, it's a long journey. But in today's world, WebGL is said to be the world's greatest invention. This paper is on the inquiry of the Web3D visualization methods in WEB. Three.js is a perfect 3D graphics engine out of many We- bGL frameworks that has a lot of built-in lights and materials. Meanwhile, it provides many convenient functions for this study. In addition, this research can be applied to the customization of LED lights and lanterns, interior de- sign, etc. This article introduces a kind of Web3D technology along with Unity 3D engine, that combines great advantages in GPU acceleration in fields of game designing and visual effects. The basic scene setup is a bit different from Three JS and Babylon JS because Unity has its own editor. All the basic things like creating a scene, adding mesh and lights can be done directly from the editor without coding a single line. This is a very ba- sic Unity feature and anyone with a little experience with the program can easily do this by adding the necessary objects to the scene from the Unity menus. Unlike Three.JS and Babylon.JS, Unity does not require the creation of a rendering loop, which is done automatically by the game engine.

Keywords:

three.js, Immersiveness, augmented reality, virtual reality, unity 3d engine.

Introduction

Three.js is a 3D JavaScript library that allows developers to create 3D environments for the web. It works with WebGL, but we can also do it with SVG and CSS. WebGL is a JavaScript API that renders triangles on the canvas at remarkable speed. It is compatible with most modern browsers and is fast because it uses the graphics processing unit (GPU) of the visitor.

For the sake of the tutorial, WebGL can draw more than triangles and can also be used to create 2D experiences, but we'll focus on 3D experiences using triangles for the sake of understanding.

A GPU can perform thousands of parallel calculations. Imagine we want to render a 3D model and that model consists of 1000 triangles - which, when I think about it, isn't that many. Each triangle contains three points. When we want to render our model, the GPU will have to calculate the position of these 3000 points.
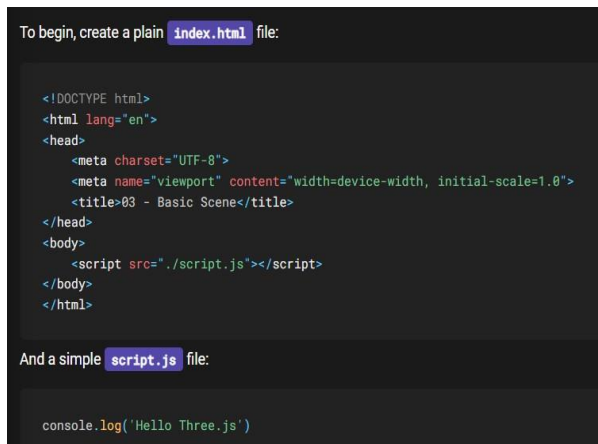
Once the model points are well positioned, the GPU must draw every visible pixel of these triangles. Again, the GPU can handle thousands and thousands of pixel calculations at once.

The instructions for placing points and drawing pixels are written in what we call shaders. Shaders are hard to master. We also need to provide some data to these shaders. For example: how to place points according to model transformations and camera properties. These are called matrices. We also need to provide data to help colour the pixels. If there is a light and the triangle is pointing towards that light, it should be brighter than if the triangle is not.

And that's why native WebGL is so hard. Drawing one triangle on the canvas would take at least 100 lines of code.

However, native WebGL benefits from existing at a low level, very close to the GPU. This allows for superior optimization and greater control.

SETTING UP A SCENE
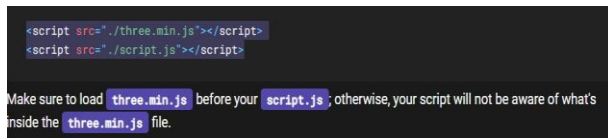
Fig: 1. Setting up a scene

Now we need to load the Three.js library.

Fig: 2. Loading the three.js library

WE NEED A CAMERA RENDERER AND THE DOM ELEMENT CANVAS

ANIMATIONS

We created a scene that we rendered once at the end of our code. That is already good progress, but most of the time, you'll want to animate your creations.

Animations, when using Three.js, work like stop motion. You move the objects, and you do a render. Then you move the objects a little more, and you do another render. Etc. The more you move the objects between renders, the faster they'll appear to move.

PHYSICS

Physics can be one of the coolest features you can add to a WebGL experience. People enjoy playing with objects, see them collide, collapse, fall and bounce. There are many ways of adding physics to your project, and it depends on what you want to achieve. You can create your own physics with some mathematics and solutions like Raycaster, but if you wish to get realistic physics with tension, friction, bouncing, constraints, pivots, etc. and all that in 3D

space, you better use a library CANNON JS , OMIO JS ,AMMO JS(An additional library for three js).

SHADERS

A shader is, in fact, one of the main components of WebGL. If we had started WebGL without Three.js, it would have been one of the first things we would have to learn, and this is why native WebGL is so hard.

A shader is a program written in GLSL that is sent to the GPU. They are used to position each vertex of a geometry and to colourize each visible pixel of that geometry. The term "pixel" isn't accurate because each point in the render doesn't necessarily match each pixel of the screen and this is why we prefer to use the term "fragment" so don't be surprised if you see both terms.

Then we send a lot of data to the shader such as the vertex coordinates, the mesh transformation, information about the camera and its field of view, parameters like the colour, the textures, the lights, the fog, etc. The GPU then processes all of this data following the shader instructions, and our geometry appears in the render.

There are two types of shaders, and we need both of them.

Vertex shader

The vertex shader's purpose is to position the vertices of the geometry. The idea is to send the vertices positions, the mesh transformations (like its position, rotation, and scale), the camera information (like its position, rotation, and field of view).

Fragment shader

The fragment shader purpose is to colour each visible fragment of the geometry.

The same fragment shader will be used for every visible fragment of the geometry. We can send data to it like a color by using uniforms —just like the vertex shader, or we can send data from the vertex shader to the fragment shader. We call this type of data —the one that comes from the vertex shader to the fragment shader— varying. We will get back to this later.

IMPORTING OWN MODEL

When you do a render in a 3D software like Blender, it usually looks better than the model you import into Three.js, no matter how hard you try to get the exact same lighting and colors. This is because of the technique used while making the render.

We can start by loading the model. We are going to keep the cube in the scene to make sure that everything is working. Once we can see our portal scene, we will get rid of the cube.

Load the model after the loaders part and test the result in the console.

SETUP

Obtaining the Library

The Three.js project is hosted on GitHub at https://github.com/mrdoob/three.js. The latest release can be downloaded from https://github.com/mrdoob/three.js/downloads. Or if you are familiar with git, you can clone the repository:

git clone: https://github.com/mrdoob/three.js.git.

The library is under active development, and changes to the API are not uncommon. The latest complete API documentation can be found at the URL mrdoob.github.com/three.js/docs/latest/, which will redirect to the current version. There is a wiki page at https://github.com/mrdoob/three.js/wiki/, and there is no shortage of demos that use Three.js or articles about Three.js development on the Web. Some of the better articles are listed in Appendix D.

Directory Structure

Once you download or clone the repository, you can place the files within your active development folder. The directory structure shows the following folder layout:

/build compressed versions of the source files

/docs API documentation

/examples examples

/gui a drag-and-drop GUI builder that exports Three.js source

/src source code, including the central Three.js file

/utils utility scripts such as exporters

Within the src directory, components are split up nicely into the following subfolders:

/src

/cameras camera objects

/core core functionality such as colour, vertex, face, vector, matrix, math definitions, and so on

/extra utilities, helper methods, built-in effects, functionality, and plugins

/lights light objects

/materials mesh and particle material objects such as Lambert and Phong

/objects physical objects

Conclusion

Hence from this paper we conclude that the three.js library is a really useful library which can be used for video game development using Unity or any other game engine. It is really easy to use and we have shown several practices of how-to setup the scenes in different game engines using WebGL component.

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