Project Synopsis

on

**Real Time Expression Emoji Maker**

Submitted as a part of course curriculum for

**Bachelor of Technology**

in

**Computer Science**



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**2022-2023**

**DECLARATION**

We hereby declare that this submission is our work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

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**CERTIFICATE**

This is to certify that Project Report entitled “**Real Time Expression Emoji Maker**” which is submitted by **MD Faizal, Manish Kumar** **and Harsh Choudhary** in partial fulfilment of the requirement for the award of degree B. Tech. in Department of Computer Science of Dr A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

**Date: 11/11/2022 Supervisor Signature**

Mr. Akash Goel

Assistant Professor

**ACKNOWLEDGEMENT**

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Last but not the least, we acknowledge our friends for their contribution to the completion of the project.

Signature:

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**ABSTRACT**

In Today’s Time Use of different communication Channel increases exponentially. Enhancing the experience of communication emojis plays a significant role. Emoji are the facial expression of human beings. They are immensely helpful in expressing human emotions effectively. In most of the application emojis are predefined and in a 2D format. Today is the era of communication technologies. The Internet and other communication devices made it possible to engage int the fast, dynamic, and affective communication.

Now time have come in which people can make their own emoji according to their face in 3D avatar and express their expression with the help of next level 3D emojis.

It seems very easy to make 3d avatar of the face in real time but it typically requires tens of digital artists to achieve a photorealistic face transformation In Hollywood movies. So, making this process automate is a next level technological challenge.

Computer vision and Deep learning come to rescue in this challenge Researchers have made some models and machine learning techniques which help us to detect the human face and expressions effectively.

we recognize real-time face expression using CNN, OpenCV and Deep Learning we will detect the six main human expressions which include neutral, fear, anger, happy, sad and surprise. After detection of emotion, it will convert this into the 3d Emoji which can further send to the other person.

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**INTRODUCTION**

Communication is an important part of everyday life. Verbal or non-verbal communication allows one to engage in conversations. Today is the era of communication technologies. The Internet and other communication devices made it possible to engage int the fast, dynamic, and affective communication.

Emojis are being used for the visual depictions of human emotions. Therefore, efforts have been put to enhance the experience of communication in human beings. So we are making a android application through which we can send our own emoji in a 3D avatar.

**PROBLEM STATEMENT**

Modifying people's faces is used in Hollywood many times, but it typically requires tens of digital artists to achieve a photorealistic face transformation.

* Tacking a position, shape and movement of the face real time.
* Animation of the 3D models to snap on the tracked face
* Compositing of the rendered CGI images with the live action footage.

“Trying to track faces. It is hard. doing this in real-time is VERY HARD!”

**OBJECTIVE**

The main objective of this project is to Track the position shape and movement of the face relative to the camera in 3D and detect the emotion of the face in real time.

After detecting face convert face into the emoji avatar in real time which can further send to the other person.

**Literature Review**

**1)An Introduction to Machine Learning**

* There have been huge advancements in the field of pharmacometrics and clinical pharmacology as having advancements in Artificial Intelligence and Machine Learning, this paper is supposed to give people in medical sciences an introduction to Machine Learning.
* This paper deals with the mechanisms and procedures by which Machine learning works, and its algorithms.
* In Data and Features section authors discuss what the input data is in the case of clinical settings for instance disease history, blood test results and gene makeup.
* They now move on to explain learning methods, that as Unsupervised Learning, in particular, they discuss the clustering of data, and how it is relevant in clinical practice.
* The authors discuss unsupervised learning methods, identifying what data can be “useful” or can act as training data to obtain output values.
* In the Discussion section, the authors put forth their final thoughts on how AI and ML in their entirety can be used in advancements in patient treatment and clinical practices as predictive methods.
* Conclusions derived: In the age of big data, there are many new opportunities for ML in clinical pharmacology. For example, data generated from wearable devices pose new challenges on how they can be linked to predictive modelling in the future. In addition, access to real-world data could provide strong evidence for covariates, supplement control datasets, and bolster models that have been trained on small datasets.
* The clinical pharmacology community will continue to base their analyses on pharmacological principles and will gradually build new ML elements to their workflow, strengthening their models further. In addition, the clinical pharmacology community will be able to enhance the range of questions they can address by using ML approaches.

# **2)Machine Learning :What it is and why it matters?**

## Machine learning is a method of data analysis that automates analytical model building. It is a branch of [artificial intelligence](https://www.sas.com/en_in/insights/analytics/what-is-artificial-intelligence.html) based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention

## Because of new computing technologies, machine learning today is not like machine learning of the past. It was born from pattern recognition and the theory that computers can learn without being programmed to perform specific tasks; researchers interested in artificial intelligence wanted to see if computers could learn from data.

## The iterative aspect of machine learning is important because as models are exposed to new data, they are able to independently adapt. They learn from previous computations to produce reliable, repeatable decisions and results. It’s a science that’s not new – but one that has gained fresh momentum.

* Resurging interest in machine learning is due to the same factors that have made [data mining](https://www.sas.com/en_in/insights/analytics/data-mining.html) and Bayesian analysis more popular than ever. Things like growing volumes and varieties of available data, computational processing that is cheaper and more powerful, and affordable data storage.
* All of these things mean it's possible to quickly and automatically produce models that can analyze bigger, more complex data and deliver faster, more accurate results – even on a very large scale. And by building precise models, an organization has a better chance of identifying profitable opportunities – or avoiding unknown risks.
* some popular machine learning methods - Supervised learning, Unsupervised learning, Semisupervised learning, Reinforcement learning
* Who's using it?
* [Government](https://www.sas.com/en_in/industry/government.html), Retail , Heathcare, Financial services, [Oil and gas](https://www.sas.com/en_in/industry/oil-gas.html),Transportation etc.

**3) Certification systems for machine learning: Lessons from sustainability**

* This paper discusses the need for standardized certification systems in the area of application as well as the development of Artificial Intelligence. Though some regulations exist in the forms of EU’s AI acts and some similar but highly insufficient acts and legislations.
* The author discusses how these issues can be analyzed using information about software objects, and information about its deployment context and downstream effect.
* The author discusses how private governance can be the key to solving machine learning's adverse footprints in the environment.
* In the last section, the author discusses how we can learn from pre-existing Sustainability certification systems.
* In conclusion, the author reiterates the importance of measurement and regulations of data processing and the likes of processes in carbon footprints.
* The method or framework proposed by the author is divided into three key parameters, being, standard setting, behaviour modification and information collection, to be elaborate,
  + A set of *technical standards* (which can cover management systems, methods of production, outcomes, or some combination therein). These standards answer the question of *what* is being regulated (what behaviour needs to be modified).
  + A *certification process* (which includes monitoring and enforcement) to ensure that the standards are being met/followed. The certification process answers the question of *how* it will be regulated – specific mechanisms for monitoring and enforcement, including appropriate auditors, who are responsible for information collection.
  + A *labelling program* (to provide information on the credence qualities to consumers). This answers the question of *communication* of participation to the “market”.

**4)** **Abusive language detection from social media comments using conventional machine learning and deep learning approaches**

* This paper essentially deals with the rise of Hate speech and abusive language, with the rise of the Internet. Focusing on the Urdu language which is like Hindi.
* The model is trained and tested on two scripts, the first being Urdu and the second being Roman Urdu or rather Romanized Urdu.
* The author describes which are the people at receiving end of this cyberbullying and trolling, namely people from specific religions or nations.
* The authors discuss unsupervised learning methods, identifying what data can be “useful” or can act as training data to obtain output values.
* The author gives different approaches or Deep Learning model methods to detect comments by Machine Learning and Neural Networks like CNN (Convolutional Neural Network), LSTM (Long Short-Term Memory), BLST (Bidirectional long short‑term memory), CLSTM (Convolutional long short‑term memory).
* The authors also apply ML models to detect abusive language and compared the performance of these models with Deep Learning.
  + Naïve Bayes: Uses conditional probability and Bayes theorem.
  + K- Nearest Neighbours (K-NN)
  + Support Vector Machine (SVM)
  + Logistic Regression
* On performing comparisons on the above-mentioned models, the authors derive that CNN or Convolutional Neural Network outperforms the other algorithms on both datasets.
* The Deep Learning Model in general performed better than conventional Machine Learning Models.
* The author gives conclusive remarks about the future direction of this research, which is mainly the generation of more and more datasets, the area of interest for these datasets are various social media websites, for instance, the likes of Facebook and Twitter to detect hate speech. Further, another research direction is to explore hybrid models of DL and ML to detect abusive language

**5)** **Online Social Network Security: A Comparative Review Using Machine Learning and Deep Learning**

* This paper essentially deals with the methods to prevent and recover from various classes of cyber security attacks or threats. This paper comprehensively surveys the evolution of online social networks, their associated risks, and solutions.
* The various security models and state-of-the-art algorithms have been discussed along with a comparative meta-analysis using machine learning, deep learning, and statistical testing to recommend a better solution.
* The authors discuss types of security threats on a social network broadly classified into two categories
  + The First is Risk related to the organization: The threat to the software/application that which organization use for personal or official purposes, any severe attack on any such application may put the network of the entire organization at risk.
  + The second is Risk related to the people: Often than not, people intentionally or accidentally reveal or expose their personal information on their social network.
* The author to achieve security of the said OSN( Online Social Networks) recognize the problem, which is the voluminous data, this huge amount of data makes it incredibly hard to make sense of.
* The authors propose to use High-performance computers, essentially supercomputers to process the data in highly specialized parallel computing algorithms.
* The Quality of service (QoS) is measured on the following parameters, Accuracy (A), Precision (P), Recall (R), and F score (F). The authors then go on to compare the results of 9 different algorithms including SVM, KNN, ANN, AIS, AIS(Artificial Immune System), RS(Rough Sets), RVM(Relevance vector Machines), RF (Random Forest), LR(Logistic Regression).
* Metrics used in the comparative analysis were True positives, True Negatives, False Positives, and False Negatives further converted to A, P, R and F scores.
* The author now compares existing algorithms by the means of statistical techniques like t-test, z-test, F-test and Chi-square test.
* After the analysis it is found that the Random Forest with Time complexity of O (M\*m\*n\* log n), where M is the Number of trees, n is the data size, m is the number of features, is the best technique for the classification in the Online Social Network (OSN).

The author gives conclusive remarks about the future direction of this research, which is that Along with the development of new models and techniques, there is a need to compare the existing models to adopt more robust and secure frameworks. Further, the optimization of the implemented framework, the evolutionary, and other approximation algorithms can be used and scaled up.

**6)** **Plant leaf disease detection using computer vision and machine learning algorithms**

* This paper essentially deals with the detection of plant leaf diseases using computer vision and machine learning algorithm.
* The authors propose a model based on IP ( Image Processing ) and ML ( Machine Learning ) approaches for detection of leaf disease.
* The authors use image processing tools like DWT, PCA and GLCM to extract the informative regions and feature of the samples.
* The authors, in the next stage, as a part of machine learning approaches, use the SVM, KNN and CNN to classify the features and the performance of the model is recorded.
* In the preprocessing stage, K-means clustering is applied on leaf images to find out the infected region. The K-mean clustering is used to get the data center of the image and make the clusters of that image and calculates the center distance from the other cluster.
* Color tracing is performed on digital leaf samples to extract their general shape information. After extracting the contour, its characteristics is analyzed and used for pattern classification.
* In the feature extraction stage, Discrete Wavelet Transform or DWT is applied on enhanced tomato leaf samples to extract useful features.
* Then, GLCM derives several properties for the extraction of leaf features. The most used feature-based features are as listed.
* The features obtained using DWT, GLCM, and PCA are combined to form feature vector which are provided as an input sample to the classifiers to recognize classify the images.
* In the classification section, the techniques such as SVM ( support vector machines ), KNN (K-nearest neighbor) and CNN (Convolutional Neural Network) are used for classifying the samples.
* In the conclusion section of the paper, the author describes the advantages of the proposed method in comparison to other publications and methods. The author argue that the analysis of the proposed model is well suited for CNN are used to distinguish diseased or non-diseased leaf.

**7 ) A Case Study of Image Classification Based on Deep Learning Using Tensorflow**

* image classification is developing and turning into a pattern among technology designers particularly with the development of information in various pieces of industry, for example, online business, car, medical care, and gaming.
* . Facebook presently can distinguish up to 98% precision to recognize your face with just a couple of labelled images and arranged it into your Facebook's collection.
* Machine learning is likewise the continuous frameworks that have been applied toward image classification. Notwithstanding, there are still parts that can be improved inside machine learning.
* .Machine Vision has its setting when it accompanies Image Classification. This technology can perceive individuals, objects, places, activity and writing in images

CHALLENGES IN IMAGE-BASED TAXONOMY IDENTIFICATION

*Massive Number of taxonomy to be Biased*, In this world, there is an enormous number of species accessible like plants, creatures, bugs thus numerous others. It is tough to bias them into the taxonomical structure. Regardless, while restricting the focus to the verdure of an area, a great many vegetation classifications ought to be upheld. Let us take a case of German's Flora shows a large number of blossoming species, and in every single class, there will be numerous different species.

*Variations on Huge Intraspecific,* A few animal groups plants have some unique agriculture attributes like area, dampness, nourishment, life cycle and climatic conditions and so forth These adjustments in cultivation qualities can happen on their estimating units, blossoms, natural products, leaves and at times even entire plants

*Accession process for variation* ,Plants leaves are in 3-d images yet when we catch then it becomes in 2-d, so sine of the highlights change like appearance. By this, enormous contrasts make between unique images and caught images like shape and appearance. Outside states of image catching additionally restricted like zoom, focus, sensor,etc.

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**PROPOSED METHODOLGY**

**ALGORITHM PROPOSED**

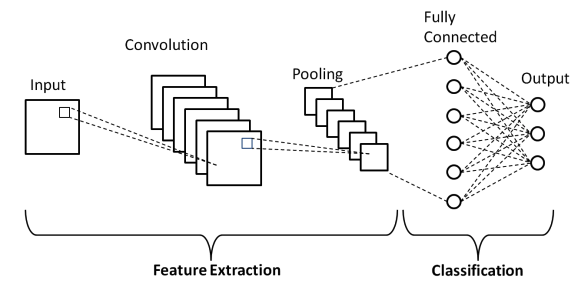
The method is divided into four Stages,

* Stage 1 dealing with Tracking the position, shape and movement of the face relative to the camera in 3D,
* Stage 2 dealing with detecting the emotion of the face,
* Stage 3 dealing with the convert the face and expression into the cartoon emoji,
* Stage 4 dealing with the implementation of this model into the mobile Application.
* **Stage 1**

Tracking the position, shape and movement of the face in real time

* Designing the network

Convolutional Neural Networks are popular for visual analysis of images and commonly used for applications such as object detection and image recognition.



* **Choosing the features to learn**

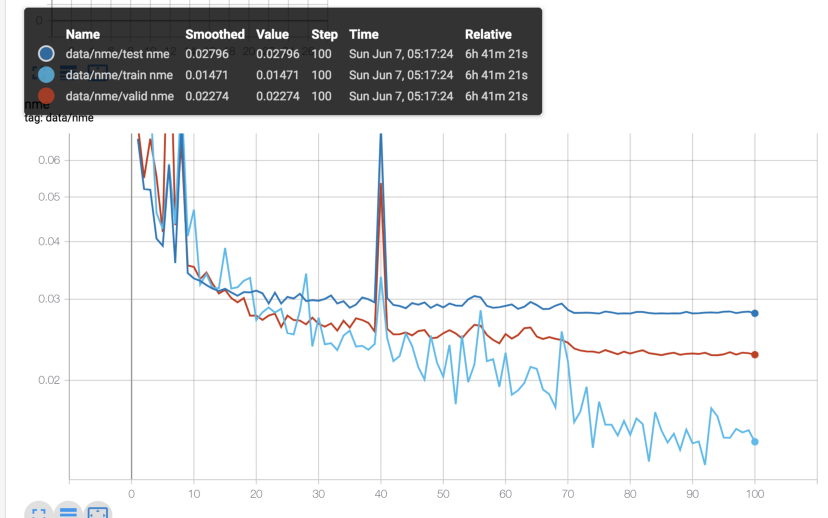
Now I need to find what features the CNN should learn. A common approach is defining a list of anchor points for different key parts of the face, also called ‘facial landmarks.

The points are numbered and associated strategically around the eyes, eyebrows, nose, mouth and jawline. I want to train the network to identify the coordinate of each point, so I can later reconstruct masks or geometric meshes based on them.

* **Stage 2**

## Training the network

The inner training loop processes mini batches of 32 images to maximize the parallel computation on GPU. A learning pass (epoch) processes the entire set of about 60,000 images and takes about 4 minutes. The training converges around 70 epochs, so I let it run overnight for 100 epochs to be safe.



**Technology used**

1. Deep Neural Networks
2. Object Priented Programming(OOPs)
3. Machine Learning
4. Android
5. Python Modules And Principles

**Conclusion**

The crux of the overall introduction provides the general understanding of the emotional recognition to obtain the facial expression using emoji. The most applications of emoji recognition investigate the images of static by the facial expression images. Here, the investigation of application of the CNN for the identification of the emotion recognition. The computational requirements as well as the complexity of the CNN, for the optimization of the efficient frame-by-frame classification have been executed in the emotional recognition for the facial expression.

It has been observed from the study of emoji real time use that detects the human emotions in different scenes, lighting conditions as well as angles in real-time. The application of novel results, that reveals the consolidations of the emoji with superimposed with the subject of faces.

**REFERENCES**

1. Solveig Badillo, Balazs Bandai, Fabian Birzele, lakov I.Davydov, Lucy Hutchinson.**Published** in Clinical Pharmacology & Therapeutics Volume 107, Issue 4 2020.

Kira J.M. Matus, Michael Veale.**Published in** Regulation & Governance 2021

1. **Thomas H. Davenport**, Analytics thought leader  
   excerpt from The Wall Street Journal
2. Muhammad Pervez Akhter, Zheng Jiangbin, Irfan Raza Naqvi **,published** in Multimedia Systems2021
3. Chanchal Kumar, Taran Singh Bharati, Shiv Prakash,**Published in Neural Processing Letters** 2021,**Via**: Springer.
4. Sunil S. Harakannanavar , Jayashri M. Rudagi b , Veena I Puranikmathb , Ayesha Siddiquaa , R Pramodhini a**, published** in Global Transitions Proceedings, **Via**: Science Direct
5. ubin Dipakkumar Kothari Department of Information Technology, Campbellsville University, Campbellsville, Kentucky Vol. 6, Issue 4, April 2018