



# **Deep Fake Detection Using Machine Learning**

**Group no : 14**

**Department of CSE**

**Jyothi Engineering College**

**Thrissur**

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## **Vision of the Department**

- Creating eminent and ethical leaders in the domain of Computational Sciences through quality professional education with a focus on holistic learning and excellence.

## **Mission of the Department**

- To create technically competent and ethically conscious graduates in the field of Computer Science and Engineering by encouraging holistic learning and excellence.
- To prepare students for careers in Industry, Academia and the Government.
- To instill Entrepreneurial Orientation and research motivation among the students of the department.
- To emerge as a leader in education in the region by encouraging teaching, learning, industry and societal connect.

## Course Outcomes

C410.1 The students will be able to analyse a current topic of professional interest and present it before an audience.

C410.2 Students will be able to identify an engineering problem, analyse it and propose a work plan to solve it.

C410.3 Students will have gained thorough knowledge in design, implementations and execution of Computer science related projects.

C410.4 Students will have attained the practical knowledge of what they learned in theory subjects.

C410.5 Students will become familiar with usage of modern tools.

C410.6 Students will have ability to plan and work in a team



## CO Mapping to POs

	POs											
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
C410.1	3	2	3	2	3	3	2	3	3	2	3	3
C410.2	2	3	3	3	3	3	2	3	2	3	3	3
C410.3	3	2	3	3	3	2	3	3	2	3	3	3
C410.4	3	3	3	2	3	3	3	2	3	3	3	3
C410.5	2	3	2	3	2	3	2	3	2	3	2	2
C410.6	3	3	3	2	2	3	2	3	2	3	2	2
Average	2.67	2.67	2.83	2.5	2.67	2.83	2.33	2.83	2.33	2.83	2.67	2.67





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## Introduction

- Deep Fake videos are AI generated videos that look real but are actually fake
- Smartphone and desktop applications like FaceApp and FakeApp are built upon this process
- Deep fake videos can have an adverse effect on a society
- These videos can challenge a person's integrity



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## Literature Survey





## DeepFake Video Detection Using Recurrent Neural Network

- Machine learning based free software tool has made it easy to create deepfakes that leave few traces of manipulation
- These realistic fake videos are used to create political distress, fake terrorism, etc.
- The proposed system uses a convolutional neural network to extract features.
- These features are then used to train a RNN that learns to classify whether a video has been manipulated or not.



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- LSTM is used to process sequence generated by CNN
- Using convolutional LSTM we can measure whether video is manipulated or not
- 92 % accuracy has been obtained



## Effective & Fast DeepFake Detection Method Based on Haar Wavelet Transform

- Deepfakes are generally created using GAN. By using GAN it became easier to create deepfakes in much realistic manner.
- Proposed method takes advantage of the fact that current algorithms can only generate deepfakes with a certain resolution
- A further distortion and blur is needed to fit the fake face with the background



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- A blur inconsistency detection scheme relied on the type of edge and sharpness analysis using Haar Wavelet is used
- This can determine whether a video has been subjected to manipulation or not
- 90.5 % accuracy has been obtained



## Classification of Real & Fake Images Using One-Class Variational Encoder

- Deepfakes are AI generated videos that look real but are actually fake.
- It requires only real images for training so data scarcity limitation can be solved.
- One class variational encoder consist of encoder and decoder
- At encoder side image is given as input and scaling is done using convolutional layer and mean and variance is calculated.This is given as input into decoder.
- RMSE value is calculated and it will be low for real image and high for fake images
- Eventhough it has 97.5% accuracy, better performance is only on NT and DFD dataset.



## DeepFake Source Detection via Interpreting Residuals with Biological Signals

- Deepfakes are AI generated videos that look real but are actually fake.
- At first DeepFake are made using CNN in which the classification took place between real and fake.
- Source Detection is used in which PPG(Photoplethysmogram) which is present in human which can be identified by using computational methods
- The PPG signals depend on the surroundings lightning, skin tone, opacity etc.
- ROI(Region of Interest) is used for classification of fake and real images
- The main advantage is biological signal is used with an accuracy of 93%.



## Classification of DeepFake Using Mouth Features

- Deepfakes are AI generated videos that look real but are actually fake.
- To build DeepFake two GAN algorithms are used which are encoder and decoder
- Encoder is for dimensional reduction by encoding data from input layer this reduces number of variables
- Decoder reduces variables to create a new output
- CNN is used to export videos and image is used for comparison
- Advantage DeepFake classification using this take less compared to other only take 2 second



## Proposed System

- Here we are using Artificial Neural Networks for Deepfake Detection
- As we are using more than one indicator for checking, it has more accuracy
- The system compare headpose, eyes and mouth features.
- If all the comparisons are true the video will be classified as real
- Else it will be classified as fake

# Functional Requirements

- Detection of deepfake images
- Detection of deepfake images with varied resolution

# Non functional Requirements

- The system should be scalable
- The system should be reliable



## Modules

- Data acquisition module
- Image enhancement module
- Deepfake detection module





## Data Acquisition Modules

- DeepFake dataset collection
- Set sample size



## Image Enhancement Modules

- Noise reduction
- Size correction



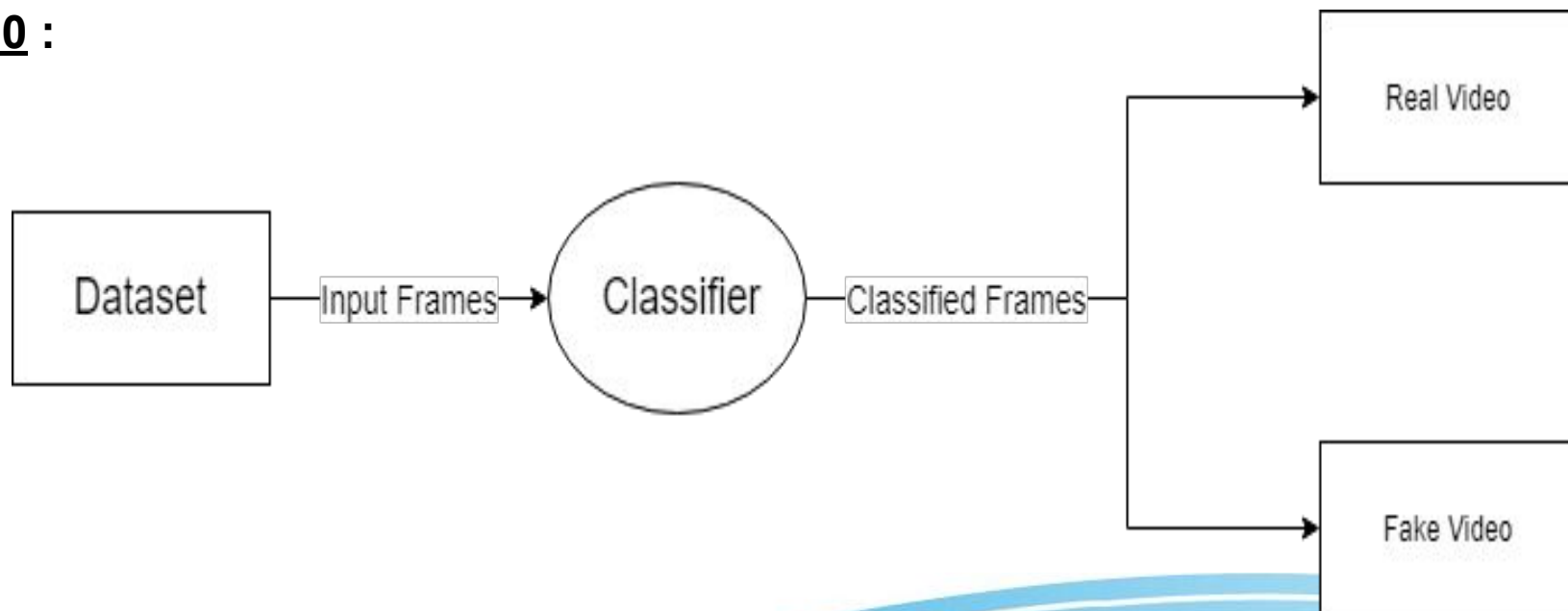
## Deepfake Detection Modules

- Artificial Neural Network is used
- Facial features are extracted
- Images are classified as real or fake



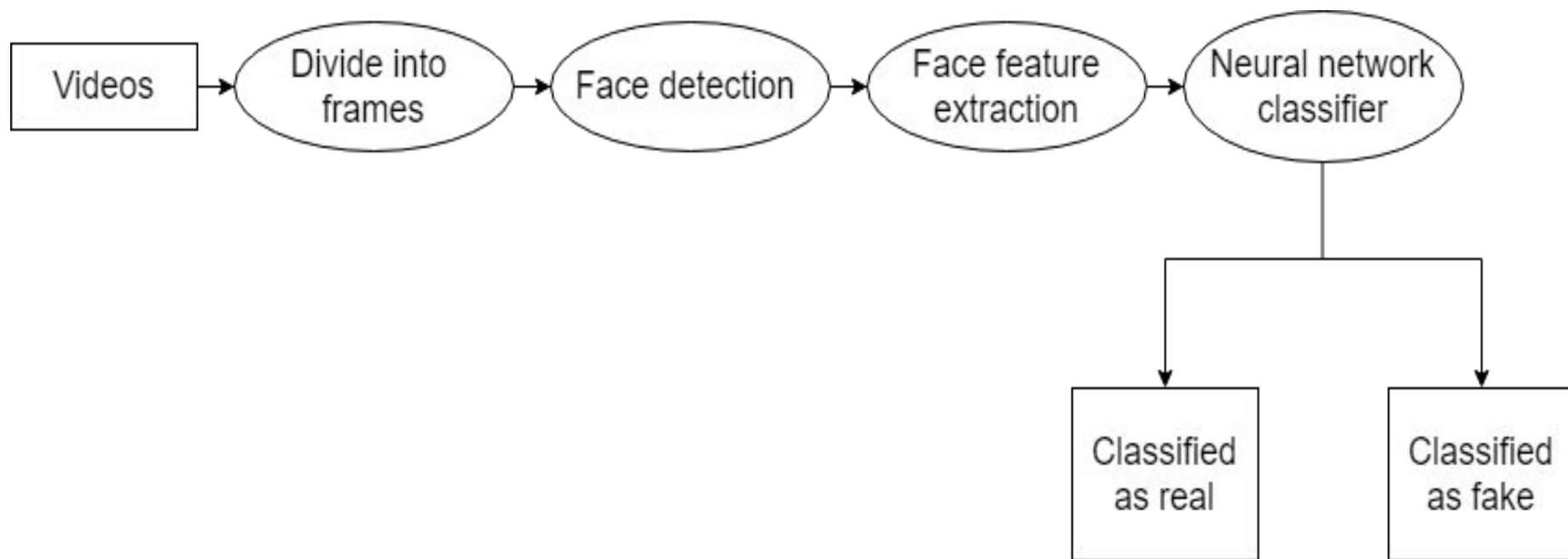
# Data Flow Diagram

## Level 0 :





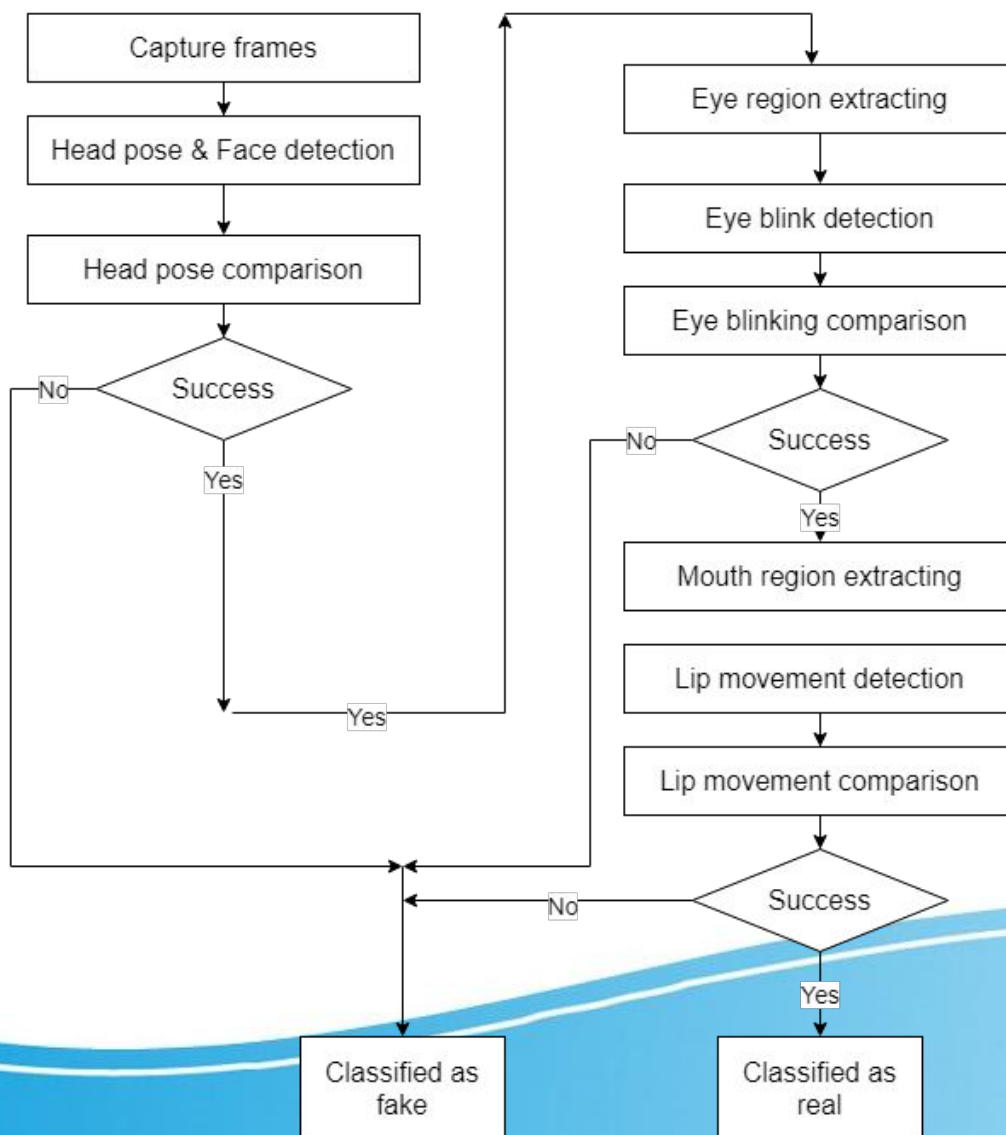
## Level 1 :



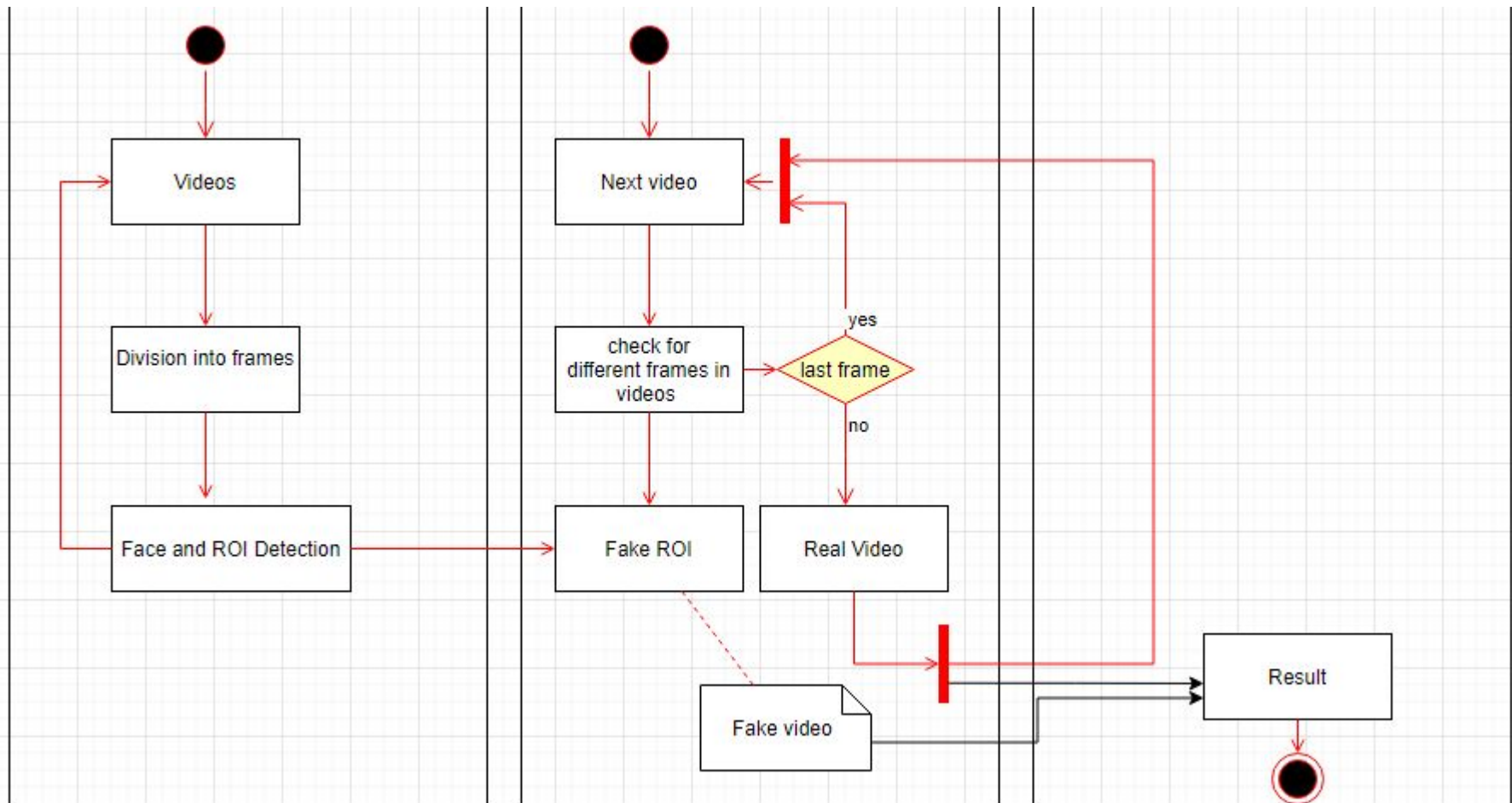




## Level 2 :



# UML Diagram



## ADVANTAGES

- Time Efficient  
Time taken may vary to identify whether video is fake or not is less
- More Accuracy  
comparing to other methods

## DISADVANTAGES

- Require More data sets  
accuracy may become low due to less dataset
- Lack of temporal awareness

## Applications of Proposed System

- Decrease the spread of fake videos so that malicious abuser could not create fake news and mislead public
- Fake videos cannot be used for political distress and blackmailing
- Can be used in cyber crime detection centres
- Protection against fake celebrity pornographic videos

## Conclusion

- In this we compare the features of head movement, mouth, eyes focusing on the variation from the original video
- Our system provides a method to detect these fake videos and thereby preventing the usage of these videos in creating political distress, blackmailing, fake terrorism events, etc.
- It has also increased the time taken to detect, making it more time efficient and resourceful



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## Thank You