



# Facial Emotion Detection using Convolutional Neural Network and Transfer Learning

Prof. JAYA SUBALAKSHMI R | Scope

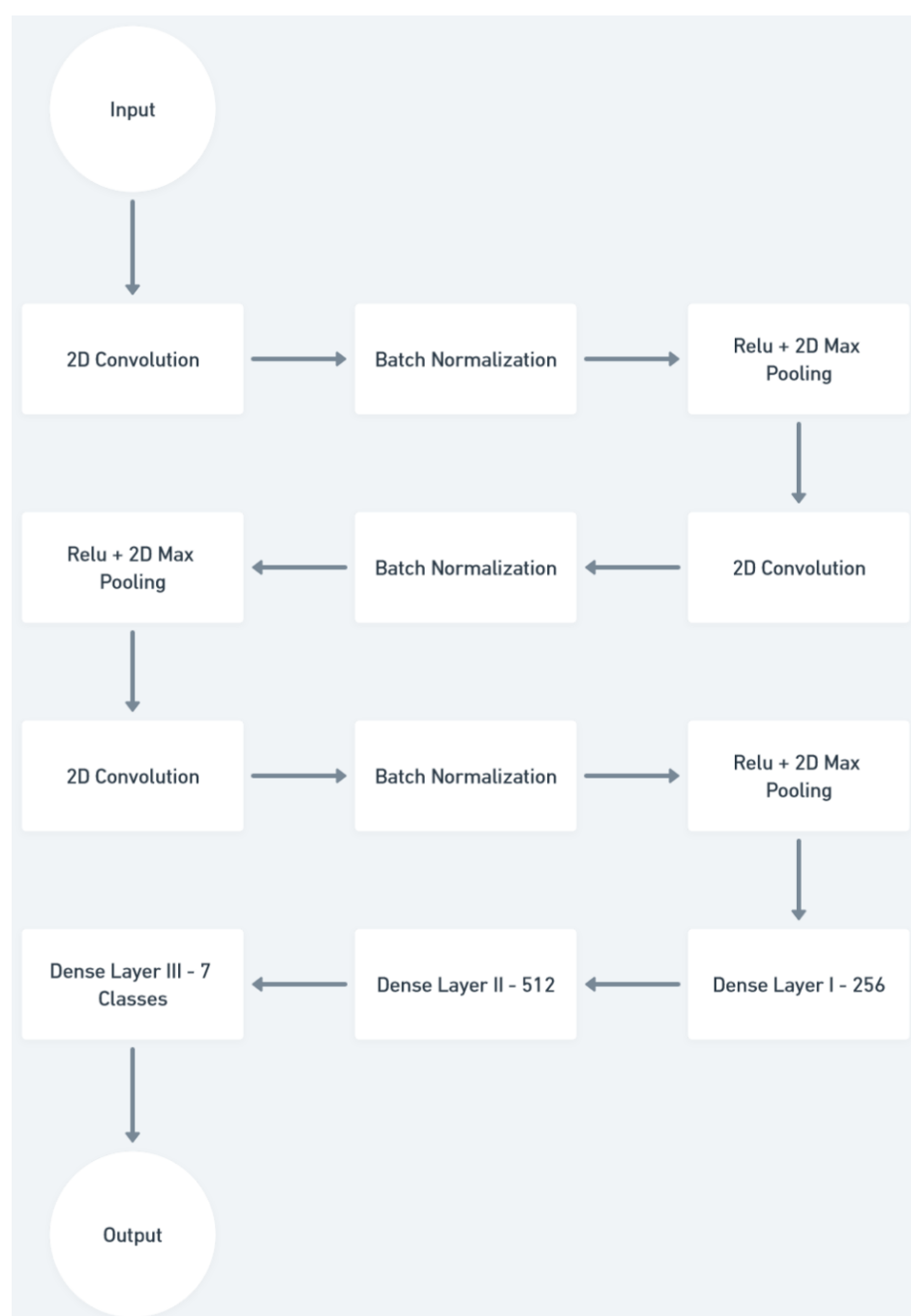
## Introduction

Facial expressions are important in recognizing human emotions, yet attributing emotions to them can be difficult. Deep learning advances using Convolutional Neural Networks (CNNs) have enabled emotion recognition from facial expressions. This work focuses on utilizing CNNs to recognize six different types of expressions: anger, happiness, fear, sadness, disgust, and neutral. The study intends to explore current strategies, assess their efficacy, and address obstacles and limitations in AI and ML for emotion recognition. The goal is to create more accurate and efficient emotion detection models for understanding human emotions in a variety of businesses.

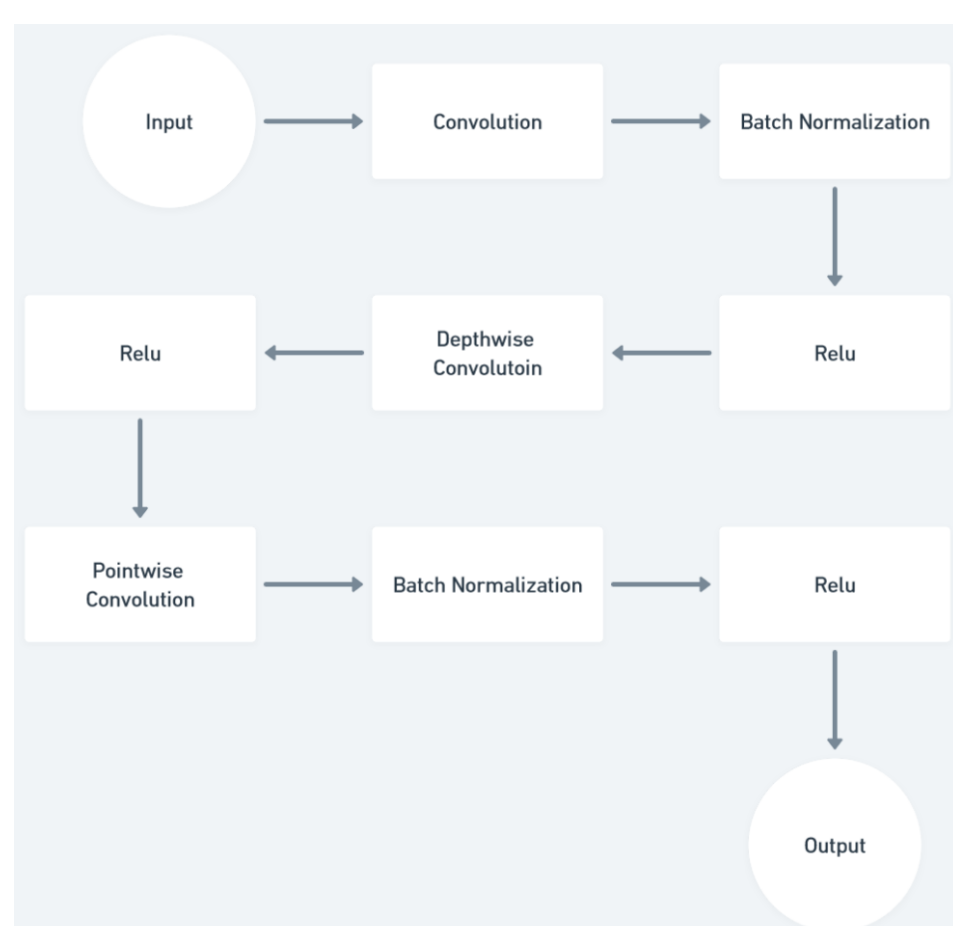
## SCOPE of the Project

The paper covers the increasing demand for AI and machine learning in emotion detection, which has applications in a variety of industries. Deep learning algorithms, specifically CNNs, have demonstrated promising outcomes. To acquire insights into human emotions in many businesses, the project intends to analyze present methodologies, overcome problems, and develop more accurate and efficient emotion detection models.

## Methodology

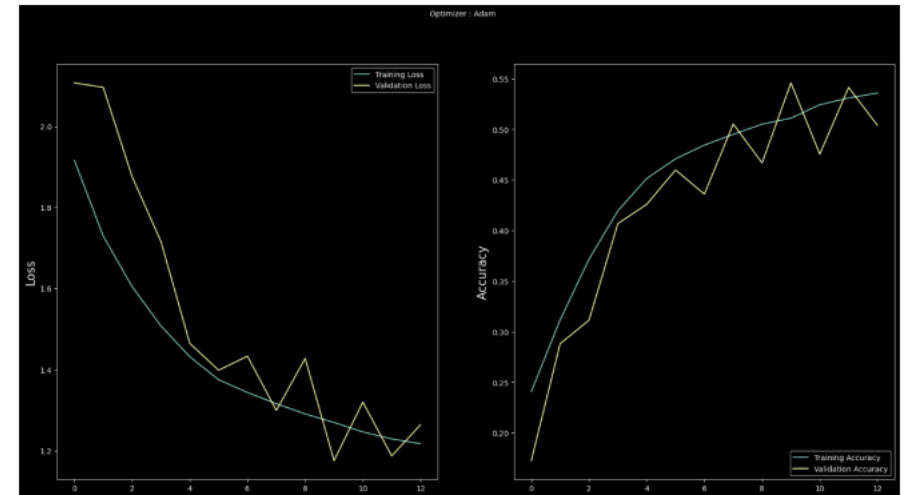


Architecture of basic CNN model

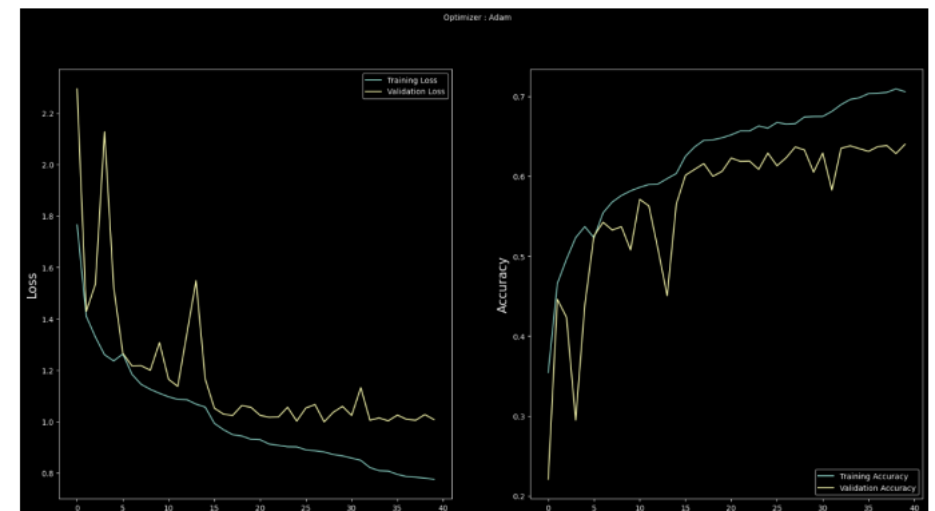


Architecture of MobileNet model used with Transfer Learning to Improve facial emotion detection.

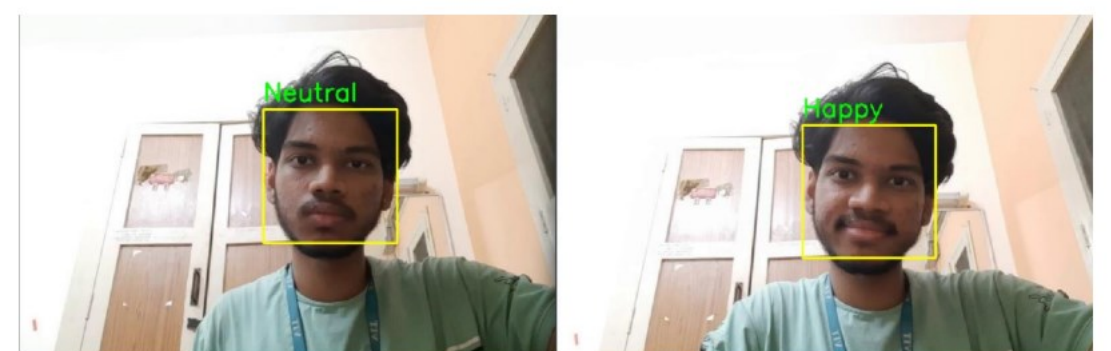
## Results



fig(a) - Accuracy and Loss graph for the CNN model that we had built



Fig(b) - Accuracy and Loss graph for the CNN model built using Transfer Learning and MobileNet pretrained model



Above picture shows a emotion portrayed by a person classified properly using our ML model

## Conclusion

A facial emotion recognition model that combines Convolutional Neural Networks with Transfer Learning accurately detects emotions from facial expressions, surpassing state-of-the-art models while being computationally inexpensive. The concept can improve healthcare, education, and entertainment services and has applications in human-computer interaction, psychology, and emotional computing. The study shows the power of integrating CNNs and Transfer Learning for emotion identification, paving the path for more advanced emotion recognition systems.

## References

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