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Title: Genre Recognition of Artworks Using Convolutional Neural Network

Authors:

Md. Kamran Hosain , Harun-Ur-Rashid,
Tasnova Bintee Taher, Mohammad
Masudur Rahman

Presented by
Md. Kamran Hosain

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Introduction

According to the objects and depicted themes, artworks can be divided by genre. In this research, Explanation from Variation of artworks has been conducted by images.

Motivation



Post- Impressionism

Motivation

**For reducing the
difficulties to identify
artworks genre**

**For knowing
the meaning
of artworks**

Objective

- Delineate artworks features: Identify artworks features and themes of artworks.
- Automate this problem: Make this problem automated.
- Accuracy: Identify the genre with better accuracy.

Challenges

1. Dataset Gathering
2. Data Pre-processing
3. Make Variation of model according to dataset perspective

Dataset Overview



Baroque



Impressionism



Impressionism, Post-
Impressionism

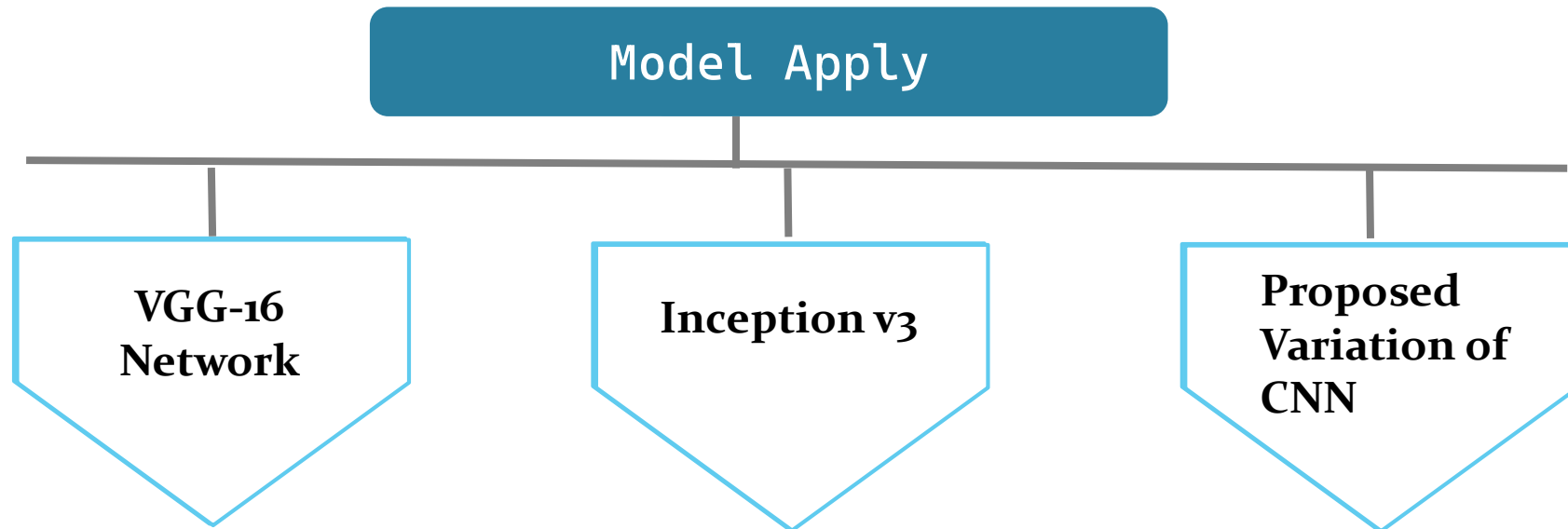


Social
Realism, Muralism

Dataset Overview

Train	Validation	Size of Dataset	Format	Resolution
2893	322	3215	.jpg	1920*1080

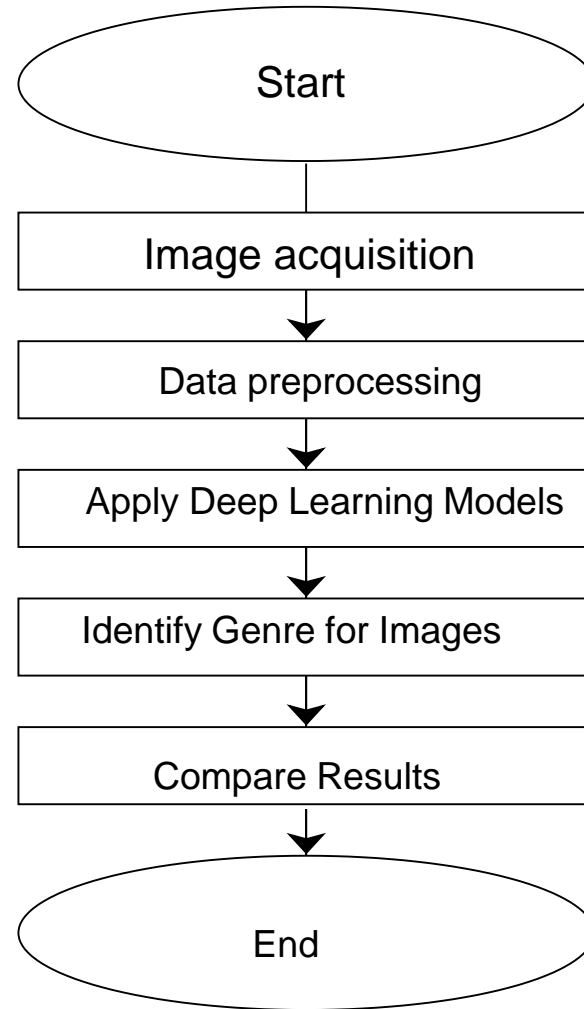
Methodology



Working Process

- Preprocess Datasets
- Apply Deep learning models
- Apply Proposed Variation of CNN Model
- Compare the models
- Data Visualization

Working Process



Proposed Variation of CNN Model

- ▶ 5 Convolutional layer
- ▶ Relu as activation Function
- ▶ Dropout set to 25%
- ▶ Classifier as Softmax

Proposed Variation of CNN Model

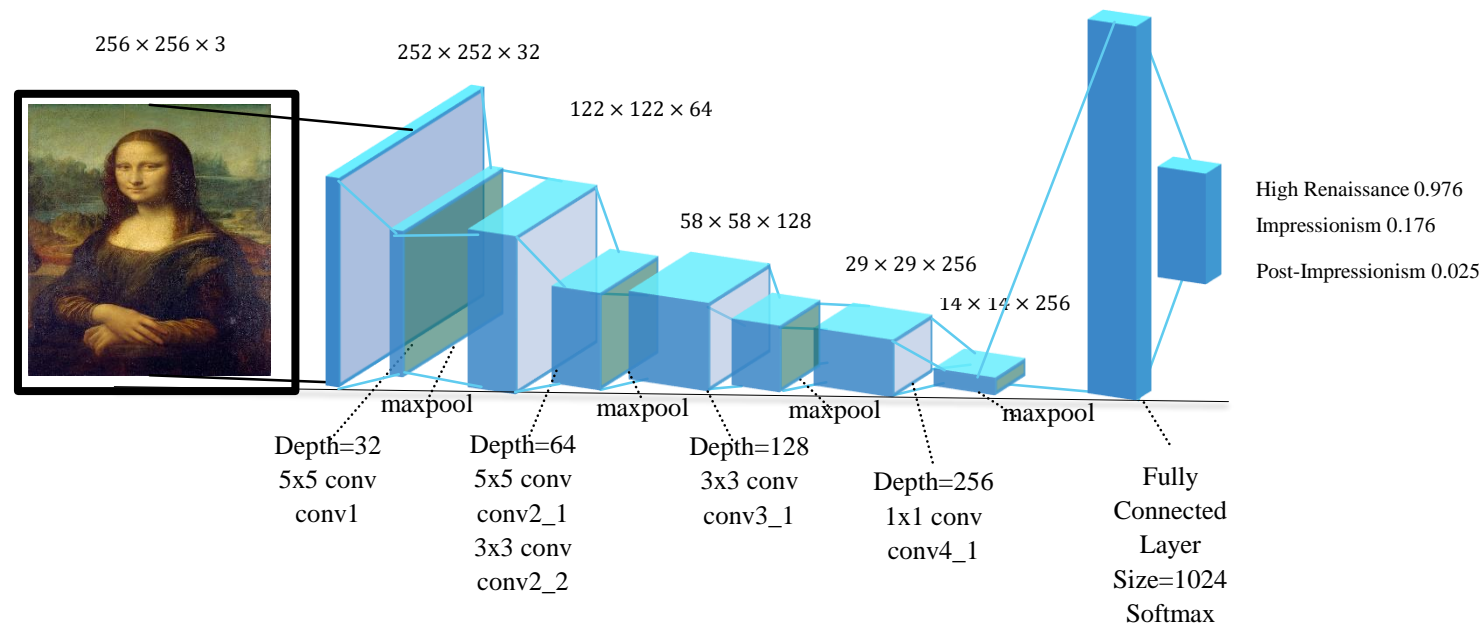
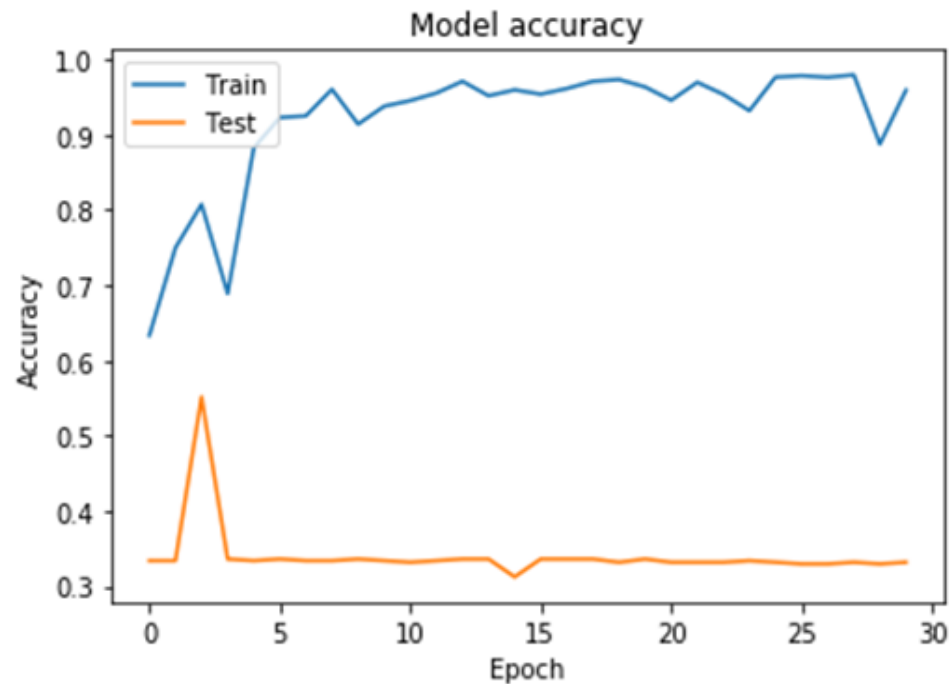


Figure: Proposed Variation of CNN model

VGG-16 Model

The VGG-16 Model was trained on the ImageNet database. It has a lot of hidden layers and parameters and its gives quite a good performance in image datasets for its extensive feature.

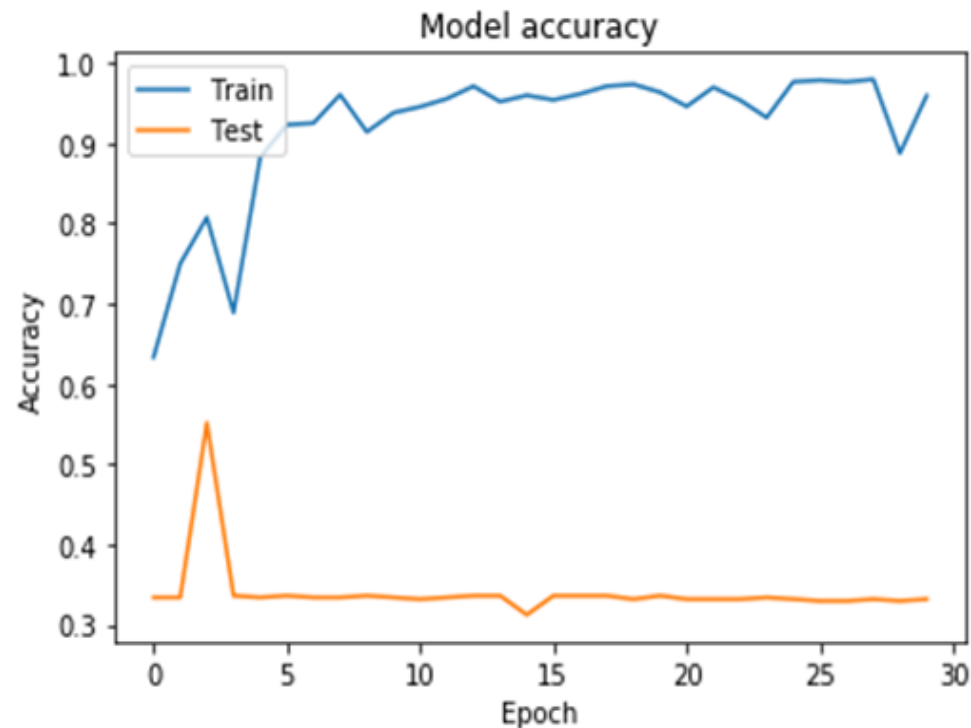
- ▶ **Training Loss:** 0.1263
- ▶ **Training Accuracy:** 0.9264
- ▶ **Validation loss:** 10.3640
- ▶ **Validation accuracy:** 0.3570



Inception_V3 Model

Inceptionv3 is a Convolutional neural network for assisting in image analysis and object detection and got its start as a module for Google net.

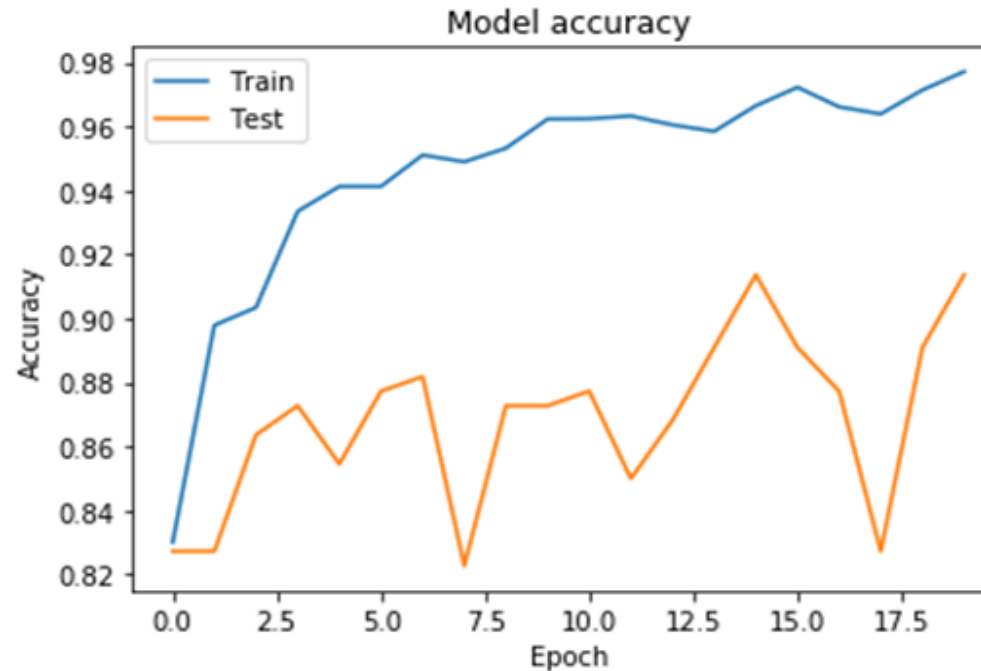
- ▶ **Training Loss:** 0.7283
- ▶ **Training Accuracy:** 0.9594
- ▶ **Validation loss:** 11.0284
- ▶ **Validation accuracy:** 0.3319



Proposed Variation of CNN Model

In this model we have modified the kernels , paddings and all of its features so that the defected images can easily be extracted for not defected images.

- ▶ **Training Loss:** 0.1043
- ▶ **Training Accuracy:** 0.9689
- ▶ **Validation loss:** 0.4306
- ▶ **Validation accuracy:** 0.9136

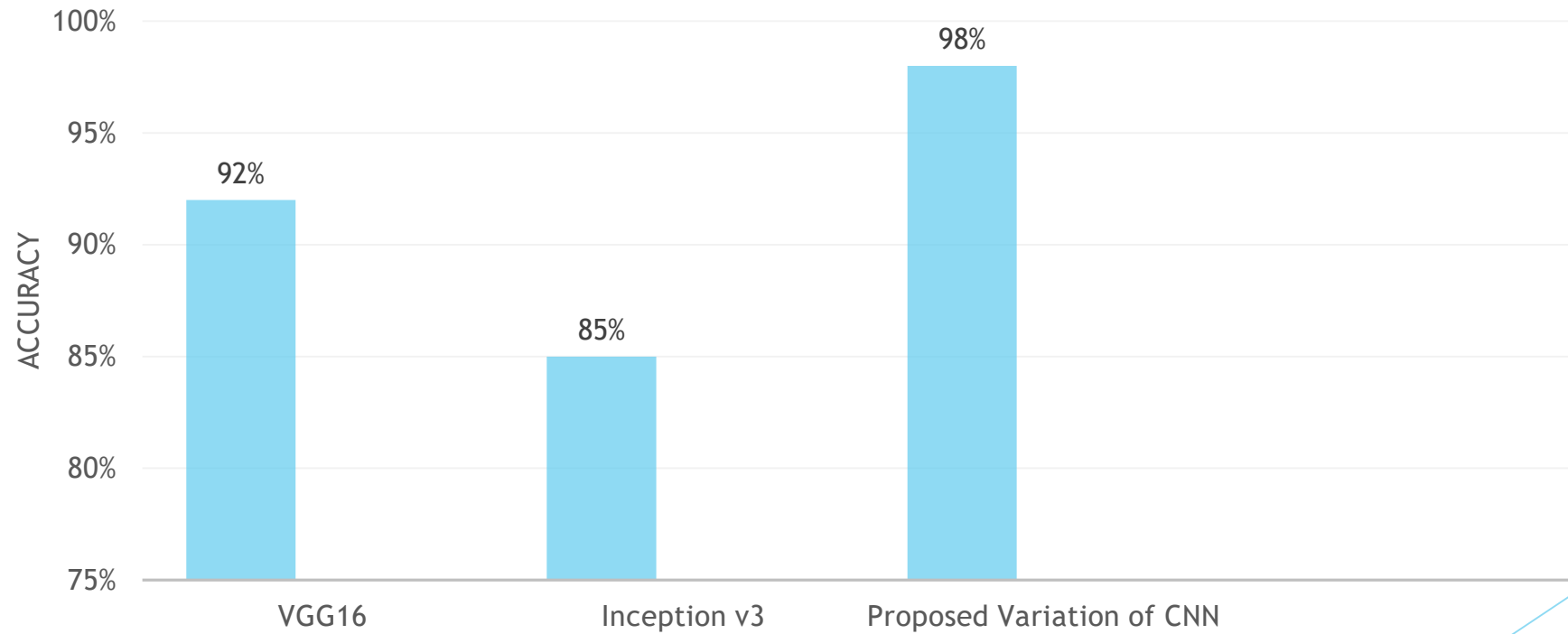


Model Evaluation Metrics

Models	Loss	Accuracy	Precision	Recall	F1-Score
VGG16	0.1263	.9264	0.8823	0.6845	0.7233
Inception v3	0.0226	.8597	0.9509	0.9418	0.9464
Proposed Variation of CNN	0.0473	.9821	0.9406	0.7279	0.8183

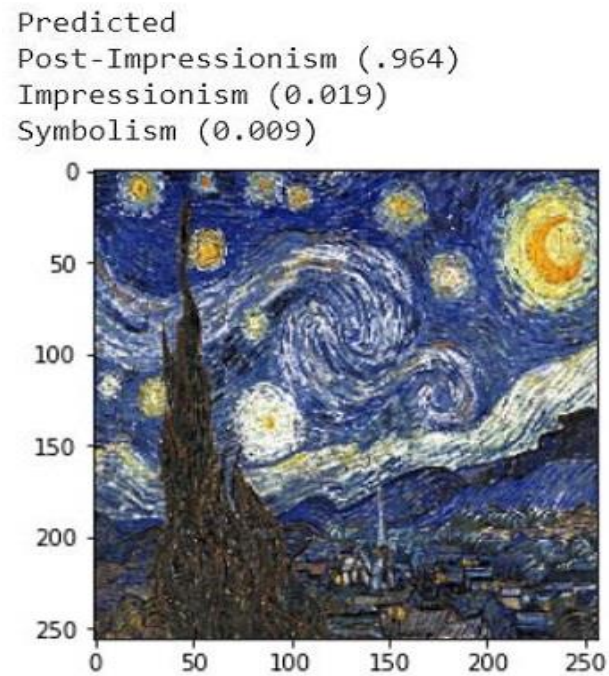
Result Analysis

Accuracy Comparison



Result Analysis

The most Accurate Model is generated from Convolutional Neural Network with **98%** of Accuracy



Outcome

Expected Outcome from this proposed model:

- ▶ Deep learning based genre recognition approach
- ▶ Can detect various types of artworks effectively
- ▶ Efficient genre classification process
- ▶ Help people to know about the meaning of unknown artworks.

Future Work

- ▶ Intended to work with higher dataset
- ▶ To identify lots of genres of artwork.
- ▶ Generating new artwork from artworks of famous artist.
- ▶ Publish a new paper on these above topics.

Conclusion

To conclude, The difficulties of comprehending artworks is no more. Features and meaning of artworks can easily be interpreted by this research. Then ,Comparison of deep learning of model has been demonstrated . Furthermore, New artist are highly benefited and can be motivated by knowing the genres of their artworks and they can also test their genres of images as well, through this research.

Thank You

