

27-10-2025

13 - Understanding the Architecture of a pre-trained model.

Aim:

To study and analyze the internal architecture of a pre-trained CNN model.

Objective

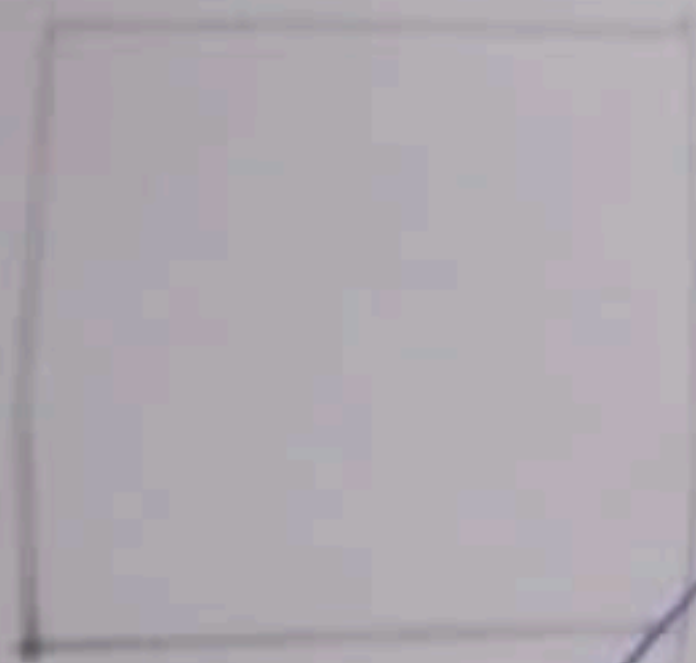
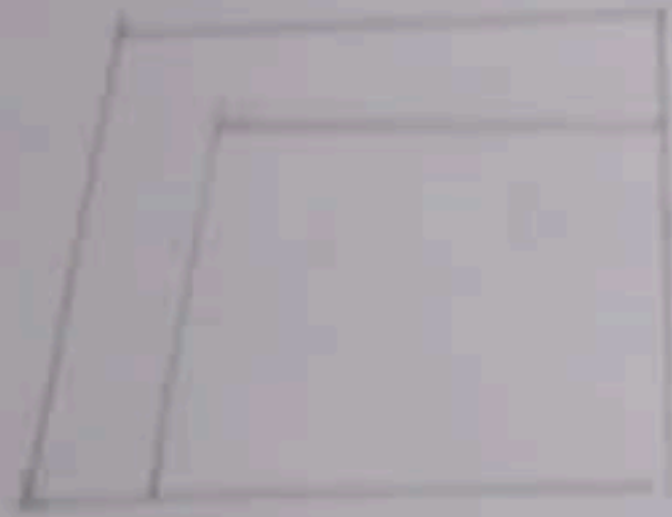
★ To understand how deep pre-trained networks are constructed.

★ To analyze convolutional layers, pooling layers, and fully-connected

★ To observe how pre-trained weights encode hierarchical image features.

Data flow

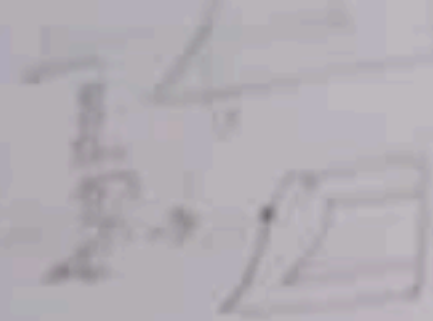
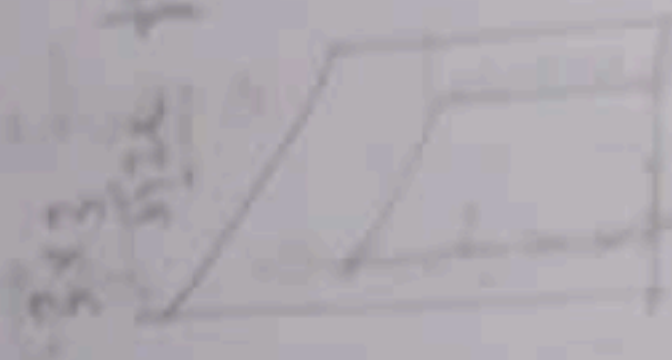
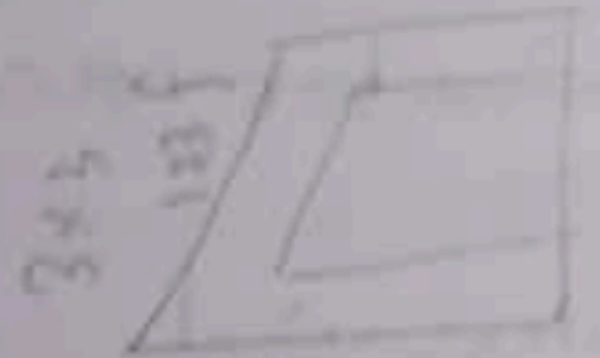
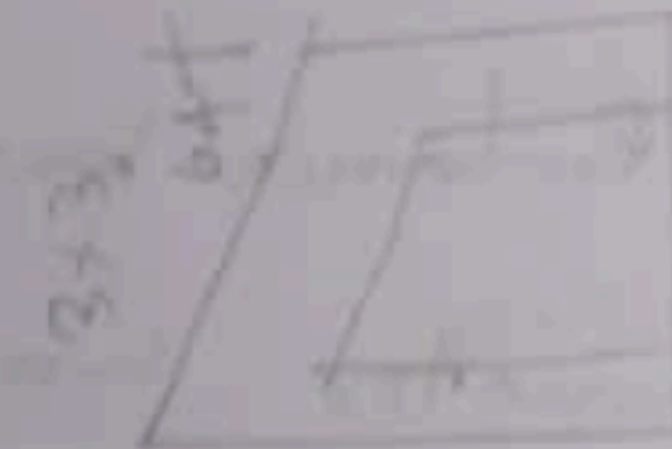
7x7 Conv



input image



3x3 max pool



Softmax
loss calculation

output

pseudocode

- ★ start
- ★ Import a pre-trained CNN model (e.g.: VGG16) with weights = imagenet

- ★ Display model summary
- ★ Visualize selected intermediate layers and their feature maps

- ★ Interpret how features for an image from edges - textures

objectives

- ★ End

Epoch

Output

Layer

Feature
Type

Description

Conv 1

Edges, colors

Basic visual
features

Layer 1

Textures

Detect shapes

Layer 2

Shapes

Recognize
patterns

Layer 3

Object

Detect
object

Layer 4

Semantic

High level
Context

observation

- ★ Early layers detected simple shapes like edges and color gradients
- ★ middle layers captured textured and repeated patterns.
- ★ Visnath selected intermediate layers and their feature semantic representations
- ★ pre-trained models reduce training time and improve accuracy significantly.

Result :

✓ The internal working of a pre-trained CNN model was successfully studied showing how deep networks learn hierarchical visual features.