**PRETRAINED MODELS IN DEEPLEARNING**

**1. Image Classification**

VGG (VGG16, VGG19): Deep CNN models with simplicity and good performance on image classification tasks.

ResNet (ResNet-50, ResNet-101, ResNet-152): Uses residual learning, excels at deep networks for high-accuracy classification.

Inception (Inception v3, Inception-ResNet v2): Captures multi-scale information with different filter sizes.

MobileNet (V1, V2, V3): Lightweight models optimized for mobile and embedded devices.

EfficientNet (B0-B7): State-of-the-art model balancing accuracy and efficiency.

DenseNet (DenseNet-121, DenseNet-169, DenseNet-201): Feature reuse through dense connections, used for classification and feature extraction.

Vision Transformers (ViT): Transformer-based models for image classification tasks, especially on fine-grained datasets.

**2. Object Detection**

YOLO (v3, v4, v5, v8): Real-time object detection with high-speed performance for recognizing multiple objects.

SSD (Single Shot Multibox Detector): Fast object detection with multi-scale and aspect-ratio bounding boxes.

Faster R-CNN: Combines region proposals with CNNs for accurate object detection.

RetinaNet: Balances accuracy and speed using focal loss to handle class imbalance in object detection.

EfficientDet: Built on top of EfficientNet, scalable and accurate object detection model.

Detectron2: Facebook AI's library for object detection tasks, includes Faster R-CNN, Mask R-CNN, and RetinaNet.

**3. Image Segmentation**

Mask R-CNN: Extends Faster R-CNN with an additional branch for pixel-wise object segmentation (instance segmentation).

DeepLab (v3, v3+): A series of models designed for semantic segmentation using atrous convolution.

U-Net: Popular in medical imaging for its symmetric encoder-decoder structure, providing fine-grained segmentation.

**4. Face Recognition**

Facenet: Deep learning model that uses triplet loss to generate embeddings for face recognition.

OpenFace: Open-source facial recognition using deep neural networks.

DeepFace: Developed by Facebook, it achieves human-level performance in face recognition.

Dlib CNN Face Recognition: A high-accuracy face recognition model using a ResNet-based architecture.

**5. Pose Estimation**

OpenPose: Real-time multi-person pose estimation capable of detecting human body, face, hand, and foot keypoints.

DeepPose: A deep learning-based approach for human pose estimation using regression.

6**. Generative Models**

GAN (Generative Adversarial Networks): A class of models used for image generation tasks.

DCGAN: Deep Convolutional GAN for image generation.

StyleGAN (v2): A GAN variant for high-resolution and photorealistic image generation.

VAE (Variational Autoencoder): Used for generating images by learning the distribution of the input data.

**7. Self-Supervised and Transfer Learning**

SimCLR: A self-supervised learning model that can be used for transfer learning to other image recognition tasks.

MoCo (Momentum Contrast): Another self-supervised learning model focused on image embeddings for transfer learning.

**8. Specialized Models**

CLIP (Contrastive Language-Image Pretraining): Trained on image-text pairs to understand images in the context of natural language descriptions. Can be used for both image recognition and retrieval tasks.

DINO (Self-Supervised Vision Transformer): Self-supervised learning applied to Vision Transformers, useful for image recognition without labeled data.