Image Classification Using Convolutional Neural Networks

Project Overview:

This project aims to develop an image classification system by:
1-ResNet
2-VGGNet
3-GoogleNet
4-EfficientNet
5-Mobilenet
6-CapsNets
7-DenseNet
8-ConvNet(2022)

The objective is to build and train a CNN model that can accurately classify images into predefined categories.

Objectives:

Optimize the model for better accuracy and efficiency.

Tasks and Steps:

- Split the dataset into training, validation, and test sets.
- Train the CNN model on the training dataset.
- Monitor the training process and use validation data to tune hyperparameters.
- Evaluate the trained model on the test dataset.
- Use metrics such as accuracy, precision, recall, and F1-score.
- Fine-tune the model to improve performance.
- Experiment with different architectures, learning rates, and regularization techniques.

Dataset:

CIFAR-10 Dataset:
- Description: The CIFAR-10 dataset consists of 60,000 32x32 color images in 10 different classes, with 6,000 images per class. There are 50,000 training images and 10,000 test images.
- Classes: Airplane, Automobile, Bird, Cat, Deer, Dog, Frog, Horse, Ship, Truck.
- Source: The dataset is available through the [CIFAR-10 website].

Conclusion:

This project will provide hands-on experience in image processing, deep learning, and model evaluation using CNNs. The CIFAR-10 dataset is a great starting point due to its manageable size and well-labeled images.