DOG BREED IDENTIFICATION USING TRANSFER LEARNING

Project Overview

This project focuses on building a Dog Breed Identification System using Deep Learning and Transfer Learning.
The system predicts the breed of a dog from an uploaded image with high accuracy.

Objectives

• Build an image classification model for dog breeds
• Apply transfer learning techniques
• Improve accuracy and efficiency
• Develop a simple web interface

Technologies Used

• Python
• TensorFlow / Keras
• NumPy, Pandas
• OpenCV, Matplotlib
• HTML, CSS, JavaScript
• Flask
• Google Colab / Jupyter Notebook

Dataset

The dataset contains over 10,000 labeled dog images collected from Kaggle.
Each image belongs to a specific dog breed class.

Project Structure

dataset/
train/
validation/
test/

model/
dog_breed_model.h5

templates/
index.html
predict.html

output.html

static/
css/
js/

app.py
train_model.ipynb

Methodology

1. Load dataset
2. Preprocess images
3. Apply data augmentation
4. Load pretrained model
5. Add custom layers
6. Train model
7. Save model
8. Test model

Transfer Learning Model

MobileNetV2 / ResNet50 / VGG16 are used as base models.
Pretrained weights from ImageNet are utilized.

Training

Image Size: 224x224
Batch Size: 32
Optimizer: Adam
Loss Function: Categorical Crossentropy
Epochs: 10-20

Results

Training Accuracy: ~90%
Validation Accuracy: ~85%