

Cat vs Dog Image Classifier using MobileNetV2

Presented by: [TEJAS PANDEY]



Project Overview



What it Does

Classifies pet images (cats vs dogs) using a deep learning model.



Technology Used

Built with TensorFlow and MobileNetV2, trained in Google Colab.



User Interface

Deployed with a Gradio interface for user-uploaded images or webcam input.

This project aims to accurately distinguish between cat and dog images, providing a practical application of deep learning for image classification.

Dataset: Oxford-IIIT Pet Dataset



- Source: Oxford-IIIT Pet dataset.
- Content: Contains images of various cat and dog breeds.
- Labels: Each image is clearly labeled as either "cat" or "dog".
- Purpose: Provides a robust and diverse set of images for training and evaluating the image classification model.

Model Architecture: MobileNetV2



MobileNetV2 Base

Utilizes MobileNetV2 as the pre-trained base model for efficient feature extraction.



Added Layers

Custom layers are added on top of MobileNetV2 for specific classification tasks.



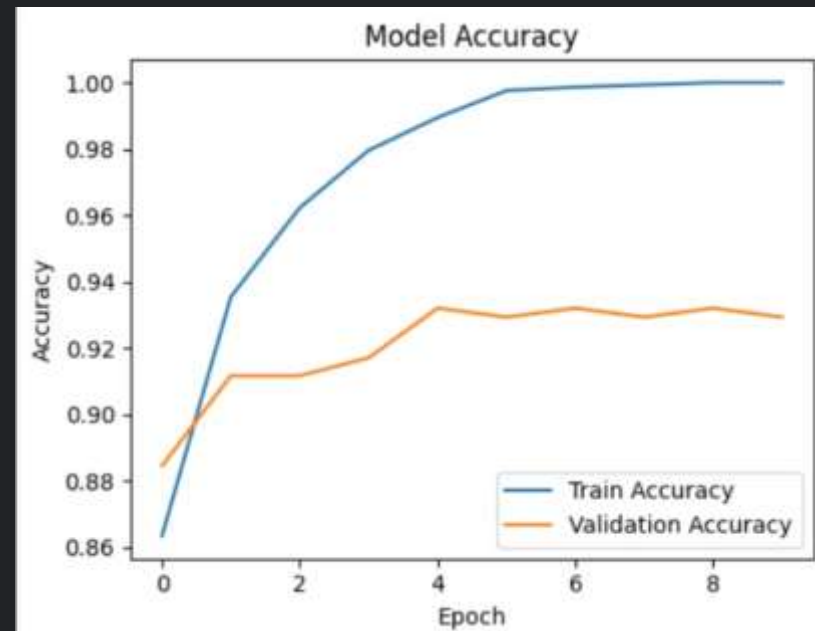
Transfer Learning

Leverages transfer learning to benefit from MobileNetV2's pre-trained knowledge on a large image dataset.

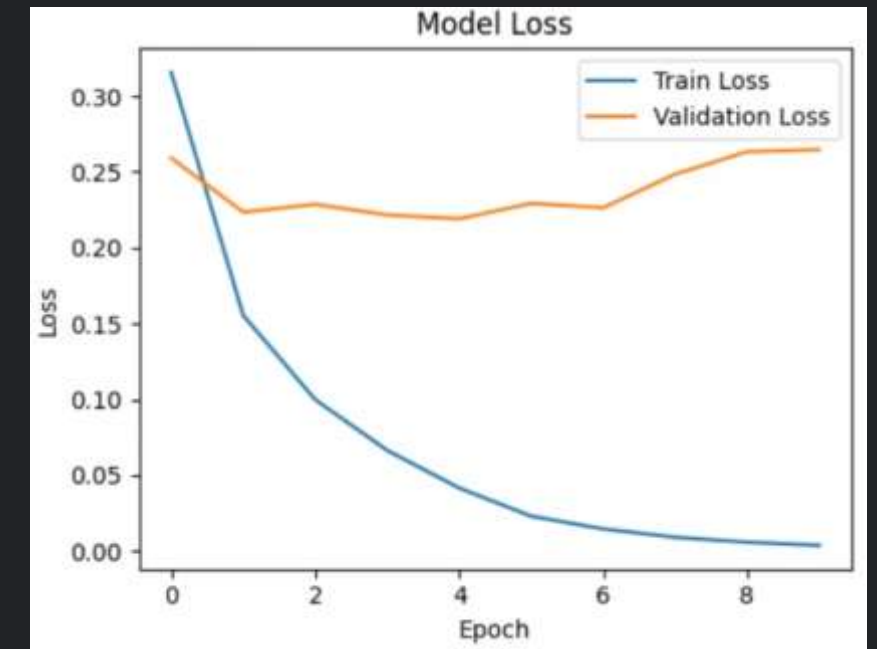
Training & Evaluation

- Epochs: The model was trained over a specified number of epochs to optimize performance.
- Loss/Accuracy Graphs: Visualizations of training loss and accuracy over epochs to monitor model learning.
- Google Drive Saving: Model checkpoints and final weights were saved to Google Drive for persistence and future use.

ACCURACY GRAPH :



LOSS GRAPH :



Interface Demo: Gradio



- **Framework:** Gradio is used to create an intuitive and interactive web interface.
- **Input Options:** Users can upload an image file from their device.
- **Webcam Integration:** The interface also supports real-time image capture via webcam for immediate classification.
- **Ease of Use:** Designed for simplicity, allowing anyone to test the model with their own pet images.

Sample Outputs



dog
prediction



Cat
prediction



Invalid
prediction

Conclusion & Future Work

Accuracy Achieved

The model demonstrated high accuracy in classifying cat and dog images, validating the effectiveness of MobileNetV2 and transfer learning.

Potential Improvements

- Expand to more pet categories (e.g., birds, fish).
- Implement real-time video classification.
- Optimize model for deployment on edge devices.