Butterfly Classification Model

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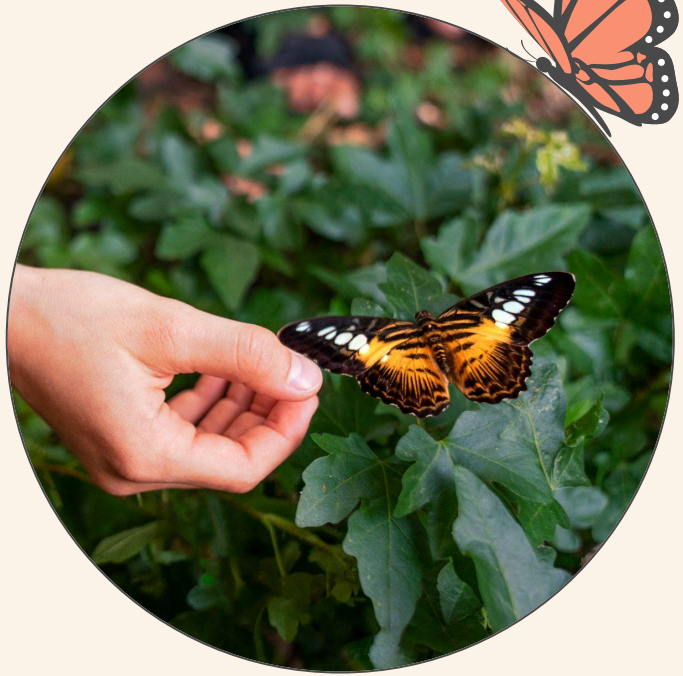
Introduction

Welcome to the Butterfly Species Prediction project! In this project, I aimed to develop a system that can accurately identify the species of butterflies from images and provide users with informative descriptions about each species. This project utilizes deep learning techniques and image processing to achieve its objectives.

Project Overview

In this project, I have gathered a dataset comprising images and textual descriptions for these ten butterfly species. The image dataset consists of 832 images in total, with a distribution ranging from 55 to 100 images per category. These images were collected from Google Images and manually filtered to ensure they depict the butterfly species of interest.



Technical Implementation

To build the butterfly species prediction system, I've employed deep learning techniques using the Keras framework. I utilized the Xception model, pre-trained on the ImageNet dataset, as the base model for feature extraction and then added additional layers for classification.

The system preprocesses the input images, makes predictions using the trained model, and provides users with the predicted butterfly species along with informative descriptions about each species.

Workflow

Data preparation Load images, preprocess, and split into training and testing sets.

Model building Initialize Xception base model, add classification layers

Data Augmentation: Apply rotation augmentation to training data.

Training Train the model using training data and validate on testing data

Evaluation Plot training and validation metrics, calculate accuracy.

Saving model Save the trained model for future use.

User Interface

01

Tkinter Gui

02

Upload button

03

Prediction display label

04

Description display label

Conclusion

Project Impact

Can make more appreciation for butterfly diversity

Future Enhancements

Improve model accuracy, expand dataset, enhance user interface.

Acknowledgements

Thank you to kaggle and to all the websites who provided the data!

"And when all the wars are over, a butterfly will still be beautiful"

—Ruskin Bond

Thank you!

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