MAEC - Multi-Animal Audio Event Classifier

This project uses the PlanetBridging MAEC to support classification of overlapping animal sounds. It uses mel-spectrogram transformation, chunking, and a dual-output CNN for detecting both **animal type** and **sub-category** from audio files.

Features

- Supports .mp3 and .wav files
- Detects overlapping sounds using chunk-based segmentation
- Predicts types of animals
- Outputs JSON predictions

Setup Instructions

Extract Dataset

Unzip Animal Sounds.zip so that a folder Animal Sounds/ is available in your working directory.

How to run the Code

A. Train the Model (Training Model.ipynb)

1. Run all cells to:
    - Load audio files
    - Convert to spectrograms
    - Train the model
2. Optionally save model:

model.save("animal_classifier.h5")

Note: Please change the directory to your own local folders.

B. Make Predictions (Extended MAEC.ipynb)

1. Update audio_path with any new file you want to use
2. Run all cells
3. View the output in JSON format

Minor Improvements for the future

Area	Suggestion
Audio Chunk Uniformity	Add fixed-length chunk standardization logic
Labeling Accuracy	Replace filename-based labeling with label_map.json
Data Augmentation	Add noise, pitch shift, and time stretch for better generalization
UI	Add streamlit, etc for real-time predictions

Major Improvements for the future

Advanced Overlapping Animal Detection:
The current model predicts one or more labels per 2-second chunk, but it doesn't perform true overlapping sound separation. For better accuracy you might want to use Spleeter or UNET-based separator. I believe by doing so it can finally meet the requirements for overlapping audio segmentation and detection.

Contribution Notes

- Update training_data.json if you add new files
- Follow existing structure in both notebooks for consistency

Reference

- Original MAEC: https://github.com/planetbridging/dockers