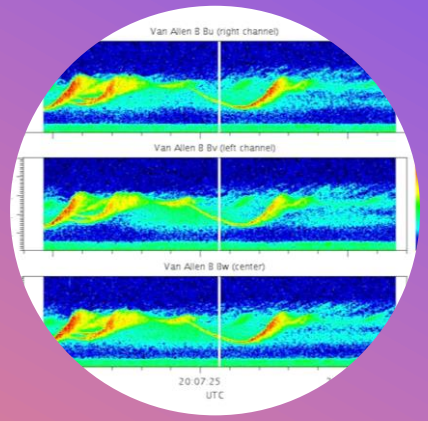
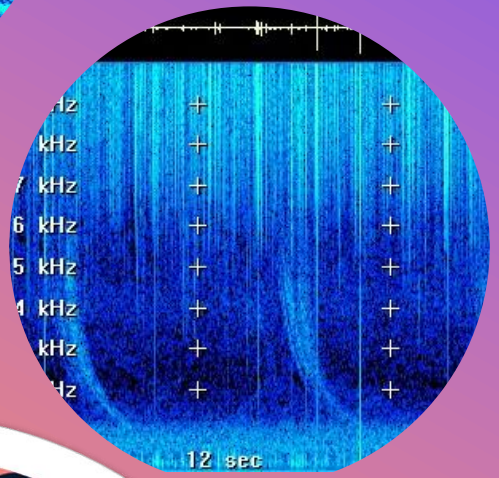
SPACESOUNDS



+



SPACE SOUNDS

Progetto finale del corso «Machine & Deep Learning for Vision & Multimedia»

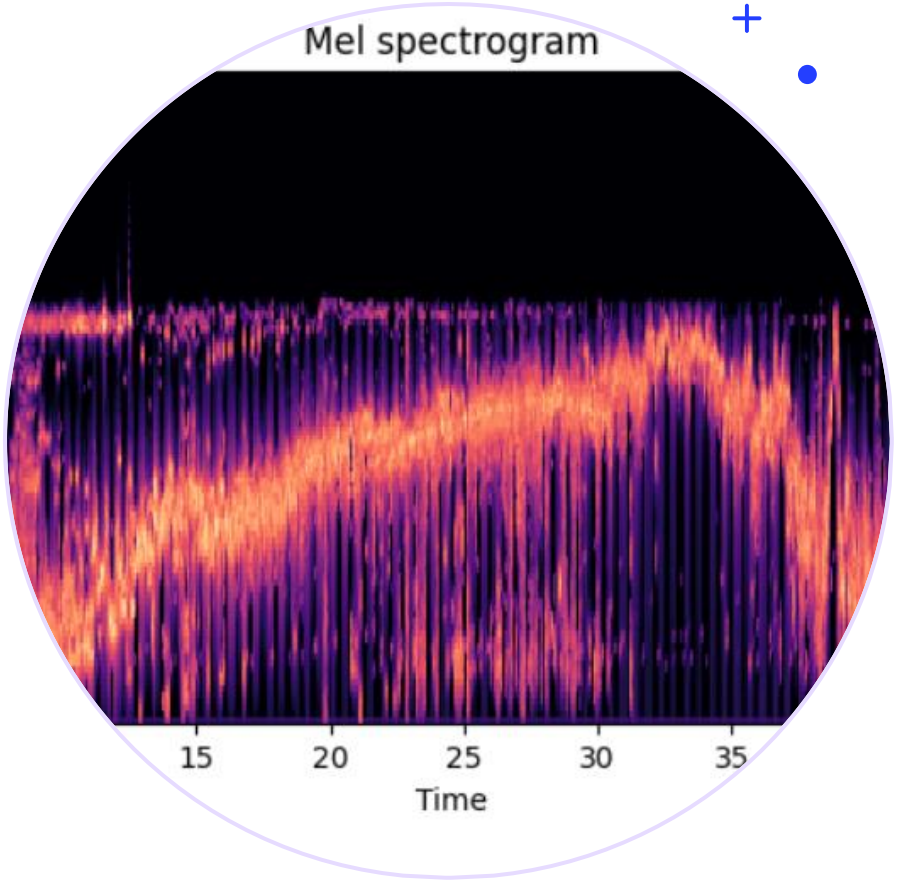
Autore: Nicolò Ballabio, ML & AI

Data: 29.11.2023

Dataset

1. Raccolta Dati → 27 file audio (.mp3, .wav)
2. Split Audio → 578 file audio
3. Labeling → 4 categorie:
4. Dataset

- Spacecraft Signals
- Planetary Sounds
- Cosmic Phenomena
- Earth's Magnetosphere



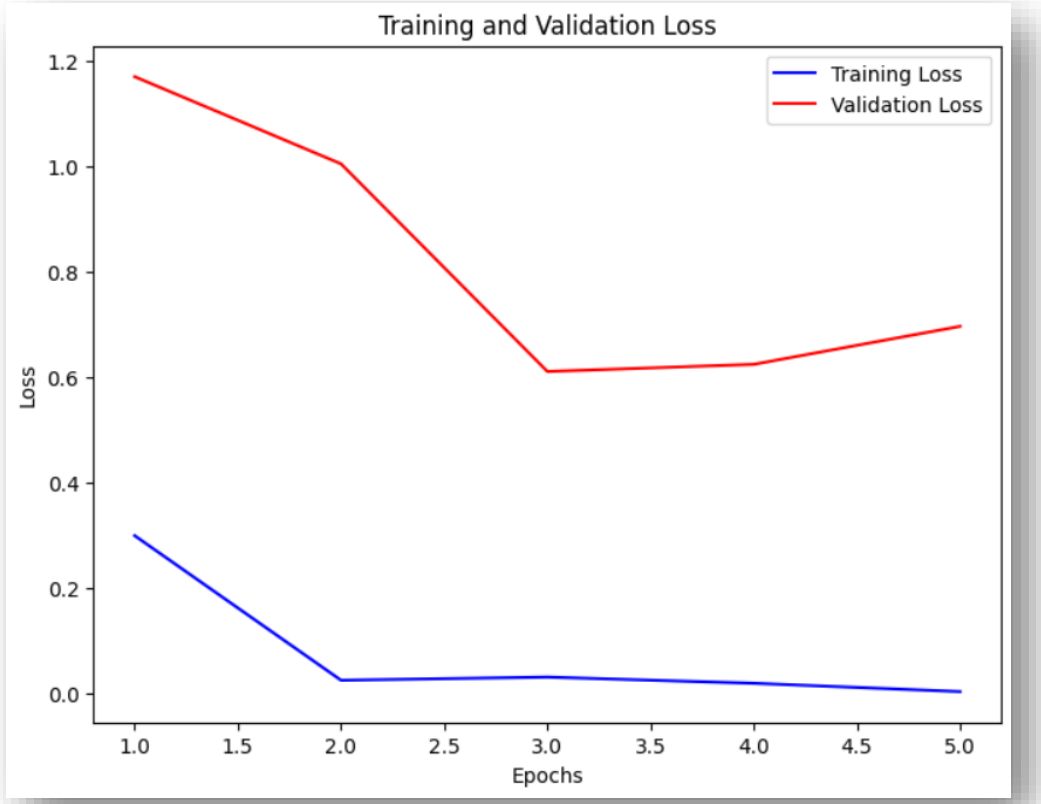
```
num_classes = 4

# CNN
model = models.Sequential([

    layers.Input(shape=(spectrogram.shape[1], spectrogram.shape[2], 1) ),

    layers.Conv2D(32, (3, 3), activation='relu', padding='same'),

    layers.MaxPooling2D((2, 2), padding ='same'),

    layers.Conv2D(64, (3, 3), activation='relu', padding='same'),

    layers.MaxPooling2D((2, 2), padding ='same'),

    layers.Flatten(),

    layers.Dense(128, activation='relu'),

    layers.Dense(num_classes)
])
```

Modello

- Rete: Convolutional
- Loss: Categorical Cross Entropy
- Metrica: Accuracy

Risultati

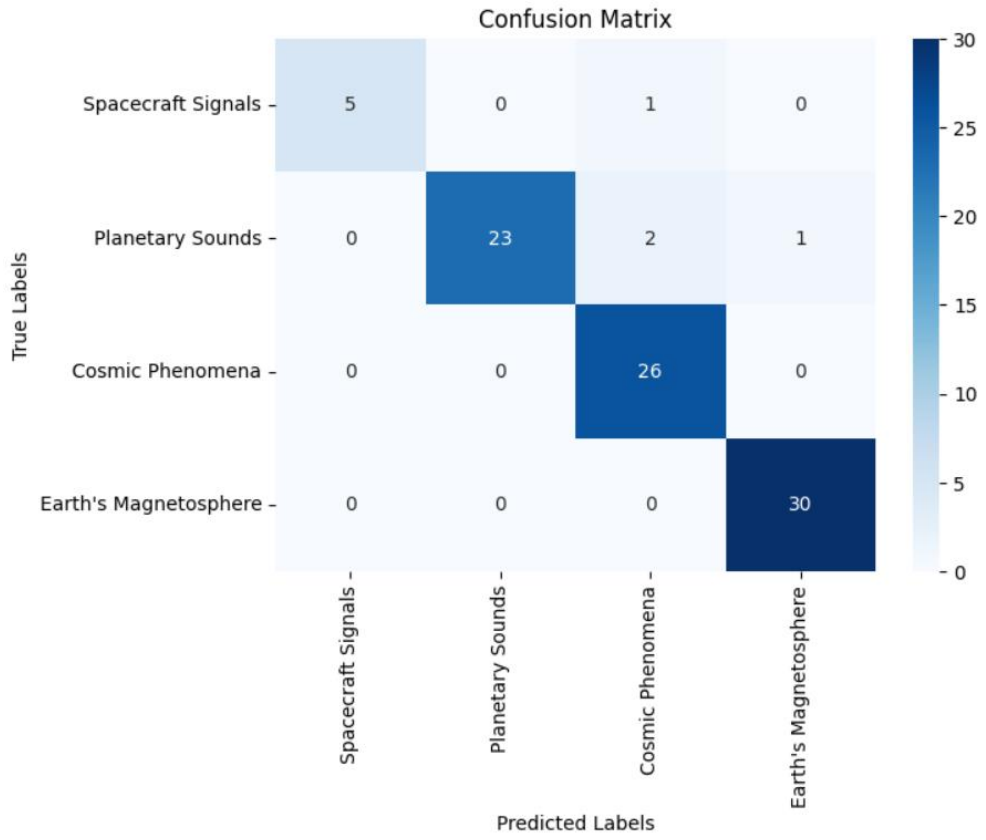
Loss



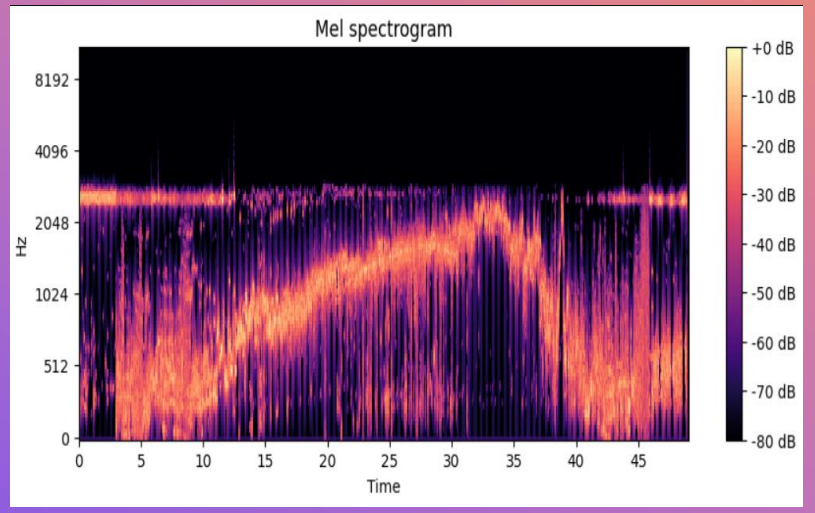
Accuracy

Risultati

Confusion Matrix



CONCLUSIONI



Dimensioni Dataset

Normalizzazione Spettrogrammi

Audio Augmentation