Understanding Speech Data using Python

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  - Command detection
  - Speaker identification and emotion detection

Loading and Displaying Speech Data in Librosa

Python Example

```
import librosa
import librosa.display
import matplotlib.pyplot as plt
# Load the speech audio file
y, sr = librosa.load("stop.wav", sr=None)
# Display basic information
print(f"Sample rate: {sr} Hz")
print(f"Audio length: {len(y)/sr:.2f} seconds")
# Plot the waveform
plt.figure(figsize=(8, 3))
librosa.display.waveshow(y, sr=sr)
plt.title("Speech Waveform")
plt.xlabel("Time (seconds)")
plt.ylabel("Amplitude")
plt.tight_layout()
plt.show()
```

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  - Loads waveform data into `y` (NumPy array)

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  - `sr` stores the sampling rate in Hz

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  - Calculates duration as `len(y)/sr` seconds

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  - `plt.tight_layout()` prevents label overlap

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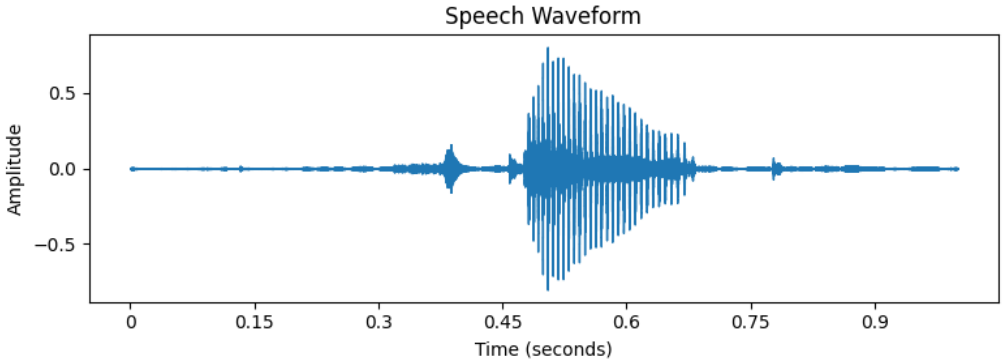
  - `plt.show()` displays the final plot

Output: Speech Waveform Visualization



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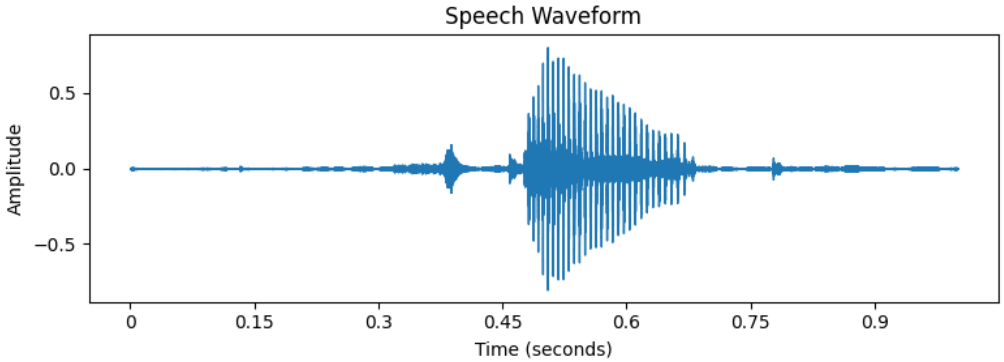

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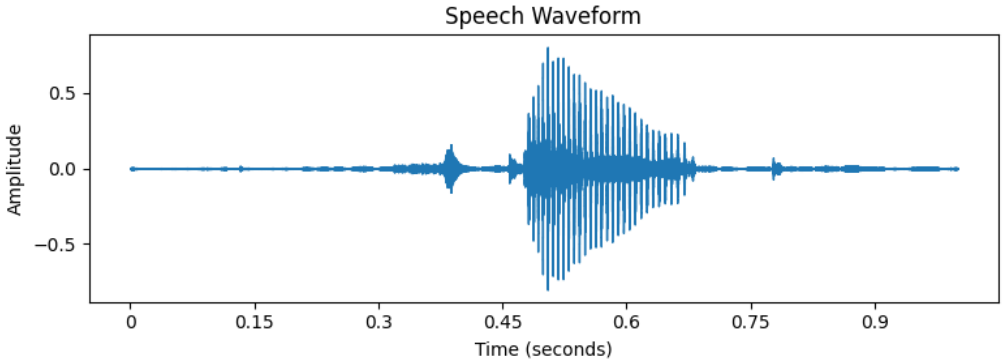

- X-axis: Time (seconds)
- Y-axis: Amplitude
- Peaks and troughs indicate speech patterns

Thank You!