

```

from matplotlib import pyplot as plt
import librosa
import librosa.display
import numpy as np

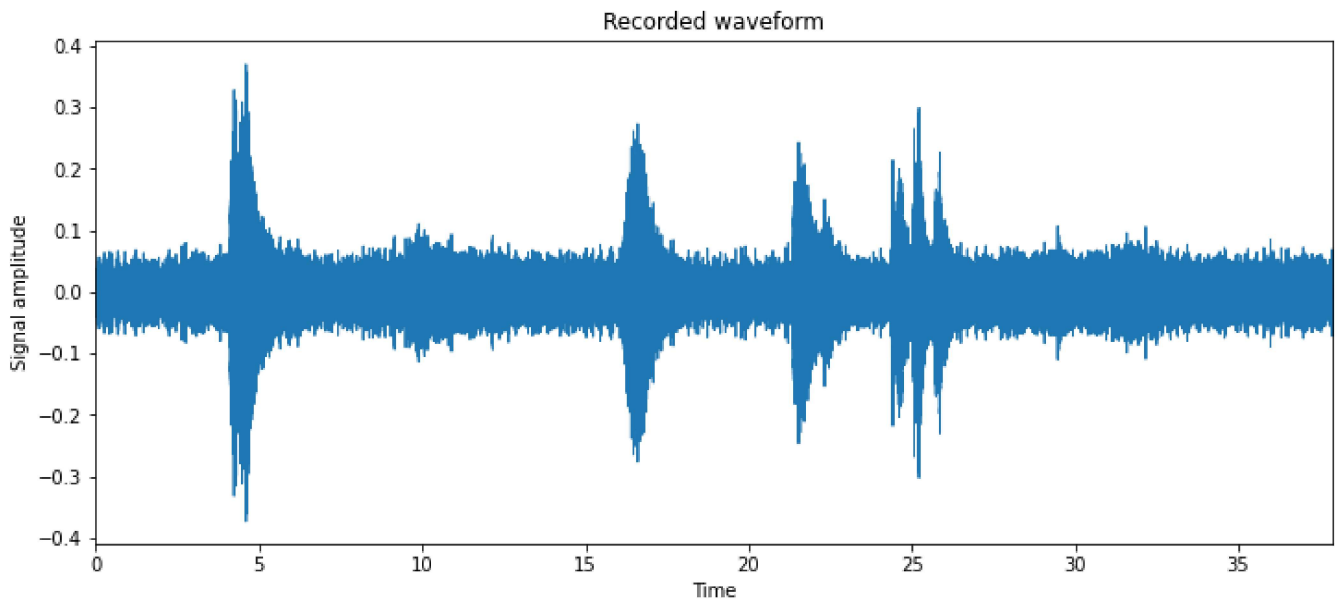
test_aud_file = "junction_test_bike.wav"

aud, SR = librosa.load(test_aud_file, sr=22050)

# %% Plot signal waves
plt.figure(figsize=(12,5))
librosa.display.waveplot(aud, sr=SR)
plt.ylabel("Signal amplitude")
plt.title("Recorded waveform")

```

☞ Text(0.5, 1.0, 'Recorded waveform')



```

# STFT short time fourier transform

X = librosa.stft(aud)
X_db = librosa.amplitude_to_db(np.abs(X))

```

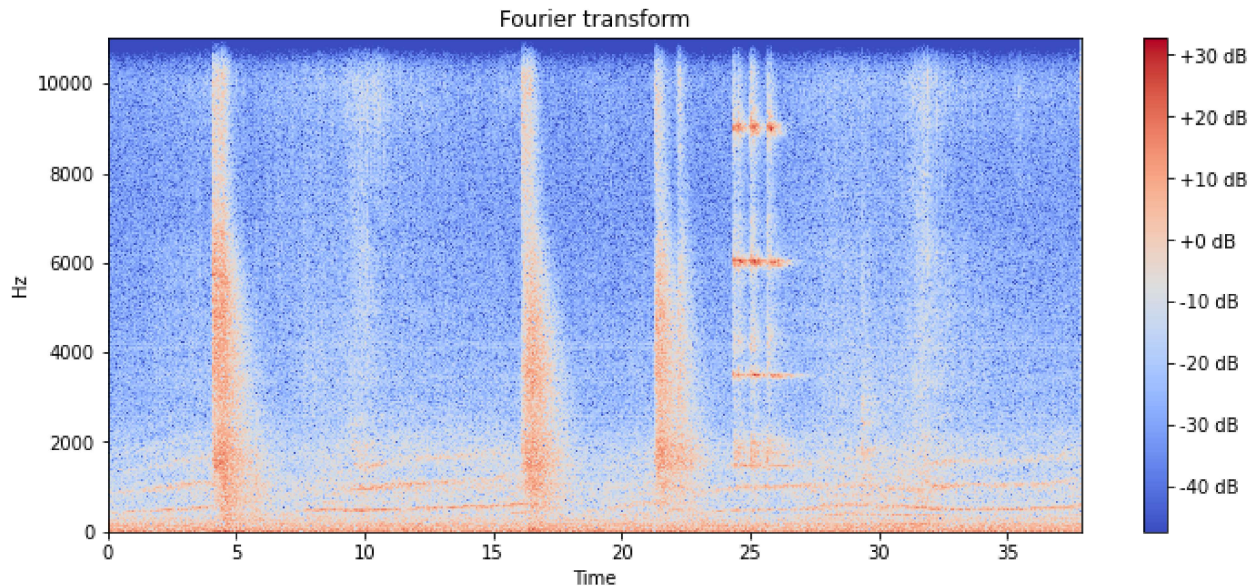
```

fig, ax = plt.subplots(figsize = (12, 5))
img = librosa.display.specshow(X_db, x_axis='time', y_axis='linear', ax=ax)

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```
ax.set(title='Fourier transform')
fig.colorbar(img, ax=ax, format="%+2.1f dB")
```

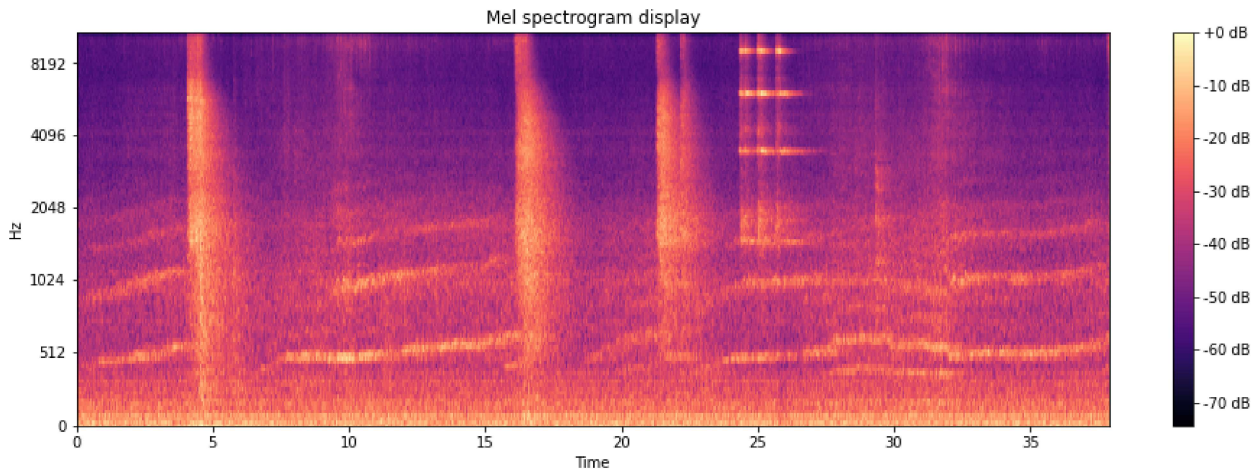
<matplotlib.colorbar.Colorbar at 0x7f4440479710>



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# Mel spectrogram
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fig, ax = plt.subplots(figsize = (16, 5))
M = librosa.feature.melspectrogram(y=aud, sr=SR)
M_db = librosa.power_to_db(M, ref=np.max)
img = librosa.display.specshow(M_db, y_axis='mel', x_axis='time', ax=ax)
ax.set(title='Mel spectrogram display')
fig.colorbar(img, ax=ax, format="%+2.1f dB")
```

<matplotlib.colorbar.Colorbar at 0x7f444023b0d0>



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