

# ONE: Online Note Extraction From Piano Sound to Music Cheat

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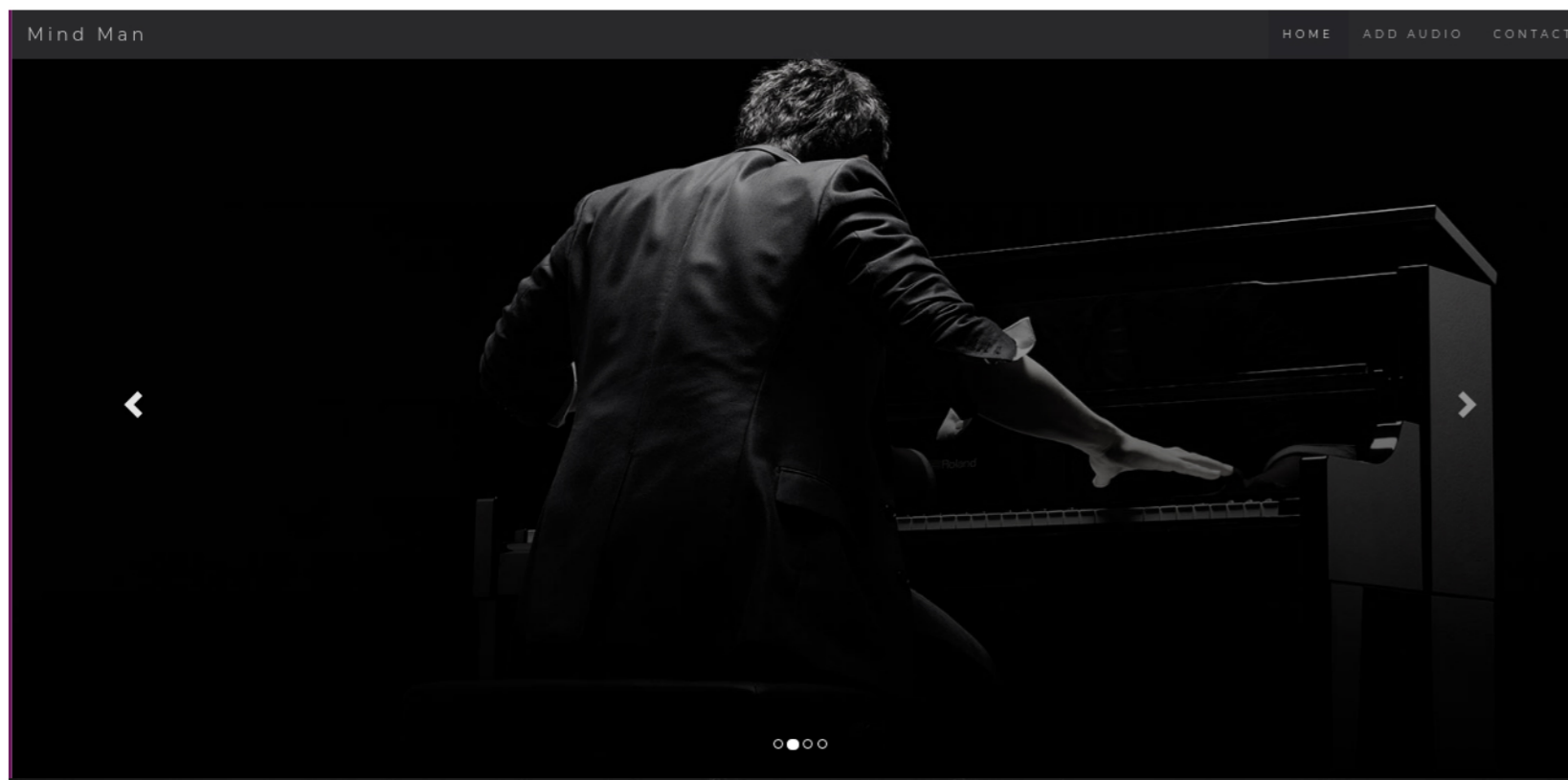
## Motivation

To learn piano quickly, you need an aspiring exercise, a lesson of a song that you would stick to. To have such a piece, you need to either have a capability to recognize the piano keys or own a piano sheet note. Generally, a piano song is composed of melody, played with the right hand, and harmony played with the left hand. It is not an easy task for a beginner to identify them. This project, **Online Note Extraction (ONE)**, aims to generate a piano sheet note of your favorite song in order to help you expedite your skill.

## Objective

To build an online web application that generates a piano sheet note from a wav sound file

## Result



Music  
Ray Charles  
I was born with music inside me. Music was one of my parts. Like my ribs, my kidneys, my liver, my heart. Like my blood. It was a force already within me when I arrived on the scene. It was necessary for me like food or water.

1 Audio Name:

2 Choose File:  No file chosen

3 Key Signature:

Upload

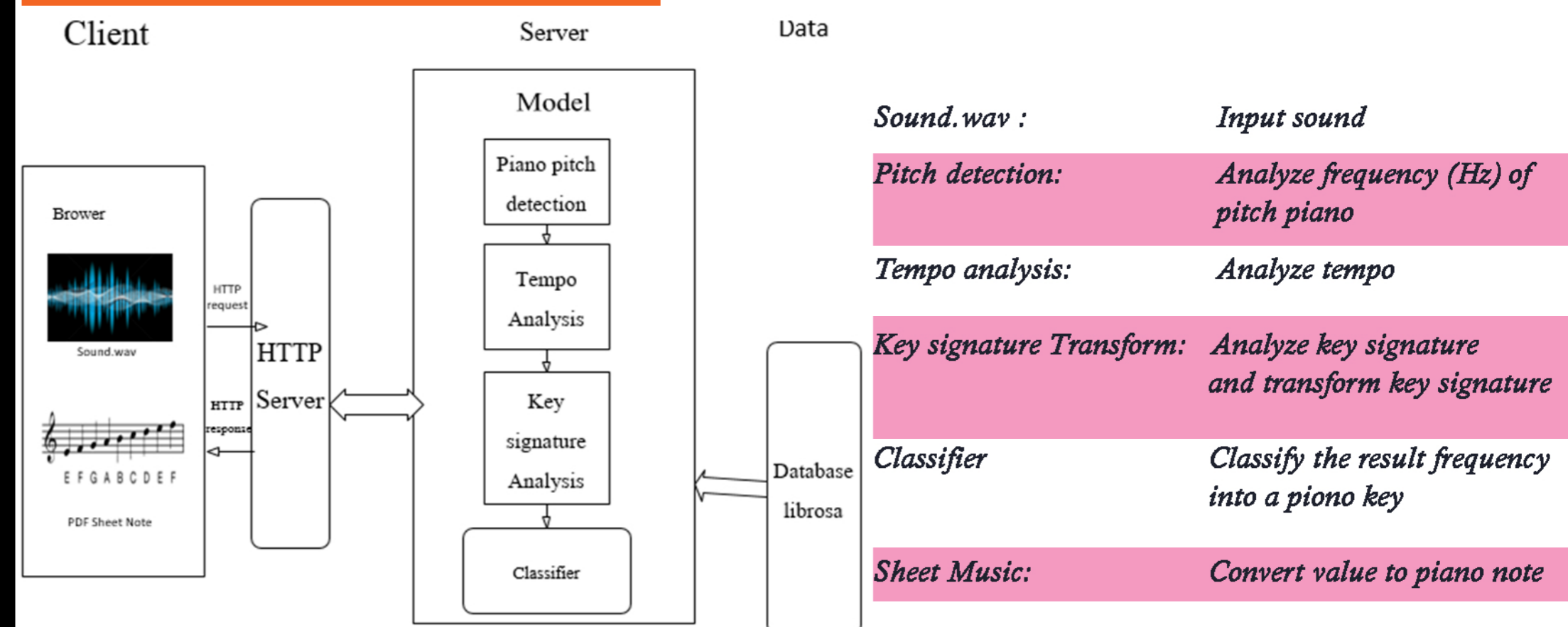
## How to use ONE

1. Enter a song filename or Browse for a song
2. Select your desired key or leave it to default (Original)
3. Upload the song and wait until it finish to get your piano note in the pdf file

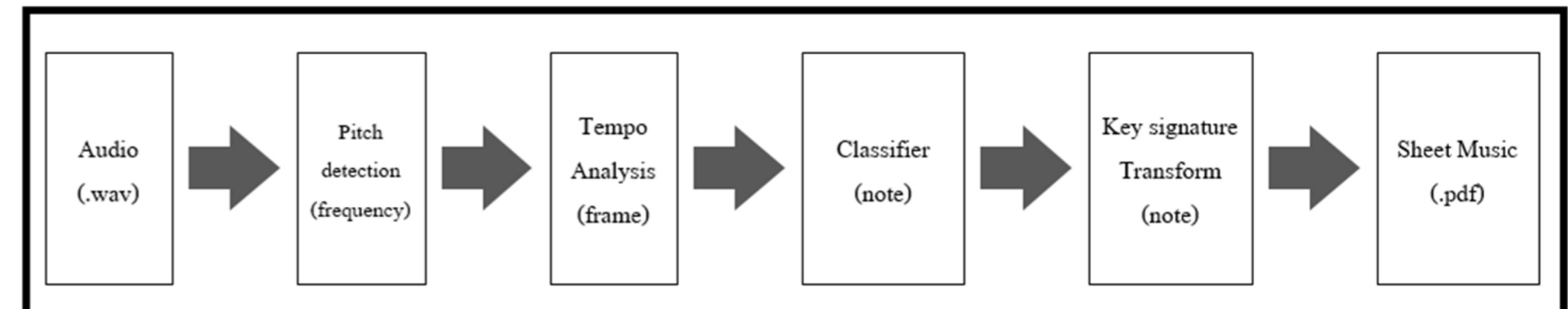
## Conclusion

ONE: Online Note Extraction to Music Cheat is an automatic extraction tool to generate a sheet note from a piano sound file in .wav format. The application intends for beginners who are not able to recognize the keys from the sound but would love to practice on the song of their interest. The extraction process takes four steps based on two main theories: Music and Signal Processing Theories. The application is online and easy to use. Users only submit a song and then get the song's sheet note.

## Architecture



## Model



## Methodology

### Pitch detection

1. Get the time series from the audio sound.
2. Transform time domain to frequency domain using Fast Fourier Transform :FFT
3. Chop the frequency into fixed frames or windows, length from 0 to 1024 or length of frequency.
4. Convert 1D of fourier value to 2D's using Short-time Fourier Transform to get 2D spectrogram and power of spectrogram. Then, convert the spectrogram value to frequency (Hz).

### Tempo analysis

5. Detect the sound's tempo by distance between peak.

### Classifier

6. Classify the result frequency into a piano key

### Key signature analysis

7. Classify key signature and transform the key.

### Sheet music

8. Create sheet piano using Abjad library in python.

