swizzle

AI powered music notation of songs

Capstone Project
neuefische Data Science Bootcamp | 19.01.2023

The who's who of *swizzle*

Flo

Data Scientist & Guitar Fan

Industrial Engineer

Ivy

Data Scientist & Music Nerd

Data Analyst

Matthias

Data Scientist & Guitar player

Electrical Engineer

Sebastian

Data Scientist & Audiophile

Life Scientist

News

72 million people play the guitar!
Andy Mooney, CEO of Fender, estimates. And the numbers just keep. going. up!

**Group of 4 Data Scientists focuse on new transcription AI.
Will "swizzle" revolutionize the music industry?**

swizzle

*Fender is one of the world's leading guitar brands

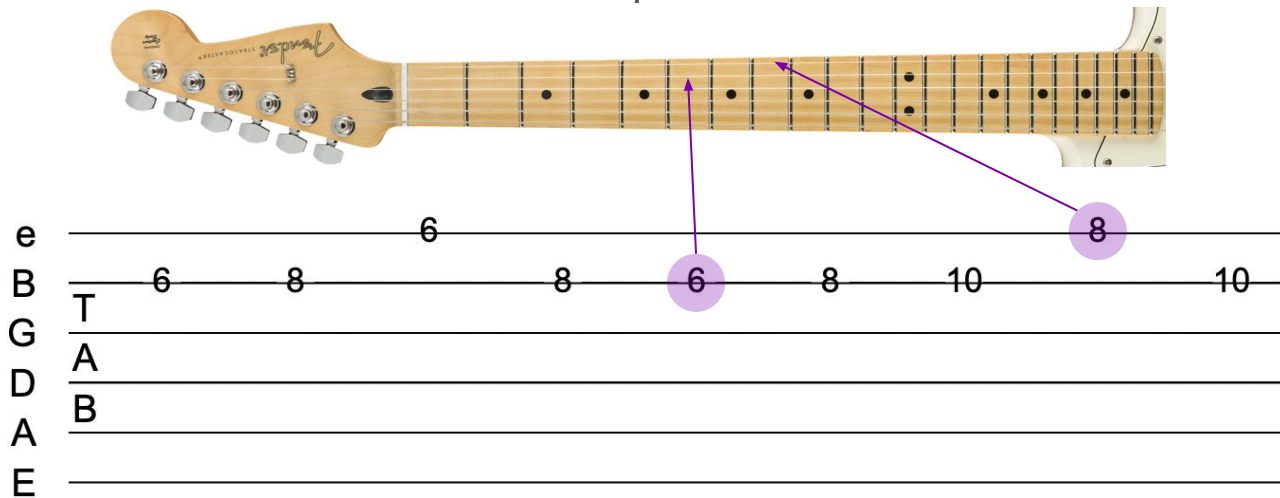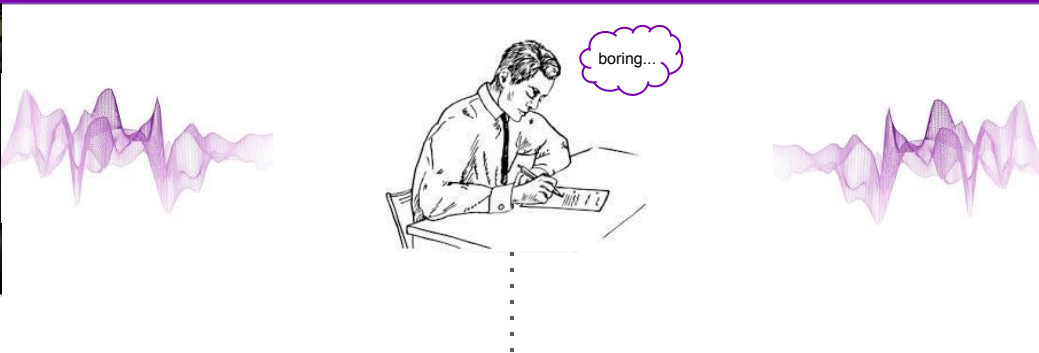# Why we do,

what we do

The problem

Manual transcription of music is tiring, time-consuming and requires knowledge.

The solution

the *swizzle* app – AI powered music notation

- easy
- fast
- smart

swizzle

What about tabs?

The Dataset

"GuitarSet"[1]

Audio files

.wav

360 samples / ~30 s each

6 different guitar players

Backing Tracks & Solo Tracks

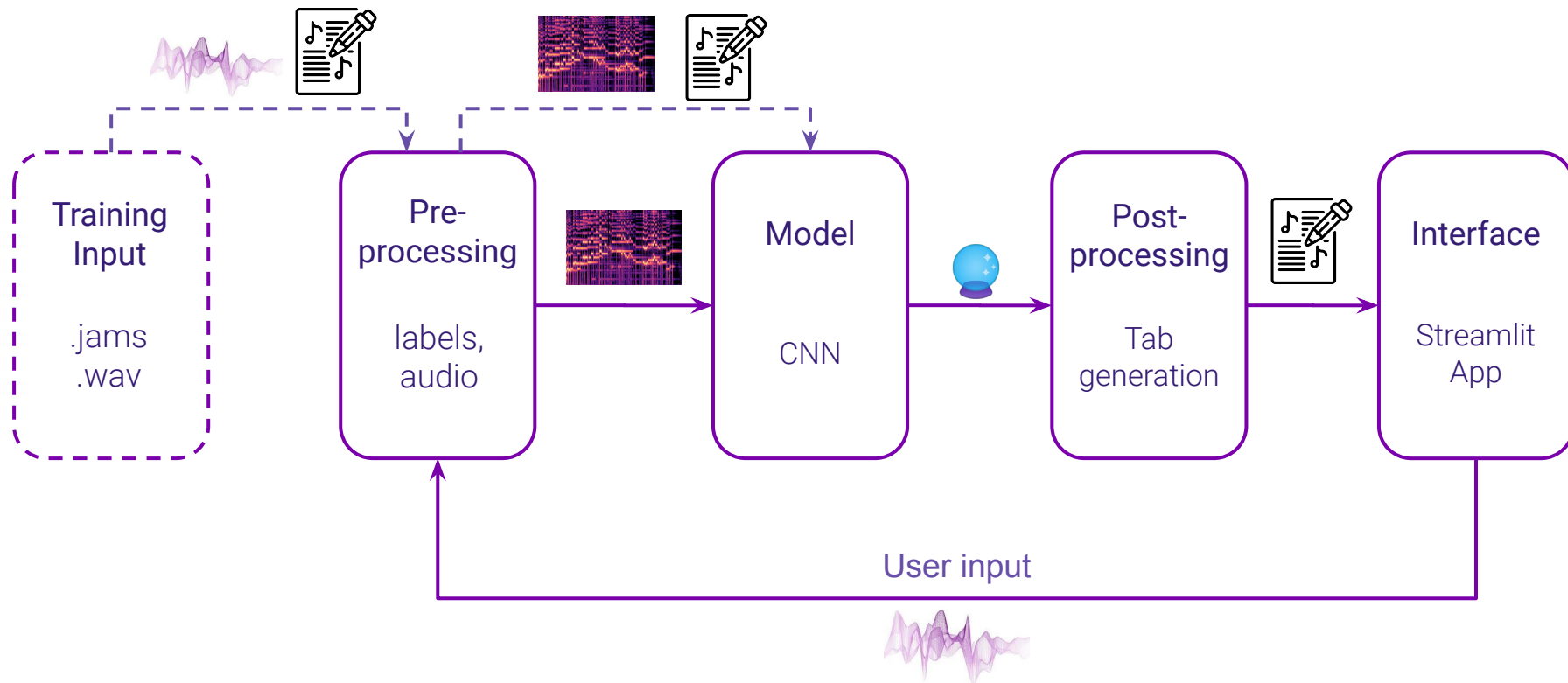Hexaphonic recordings

Mono recordings

Annotation files
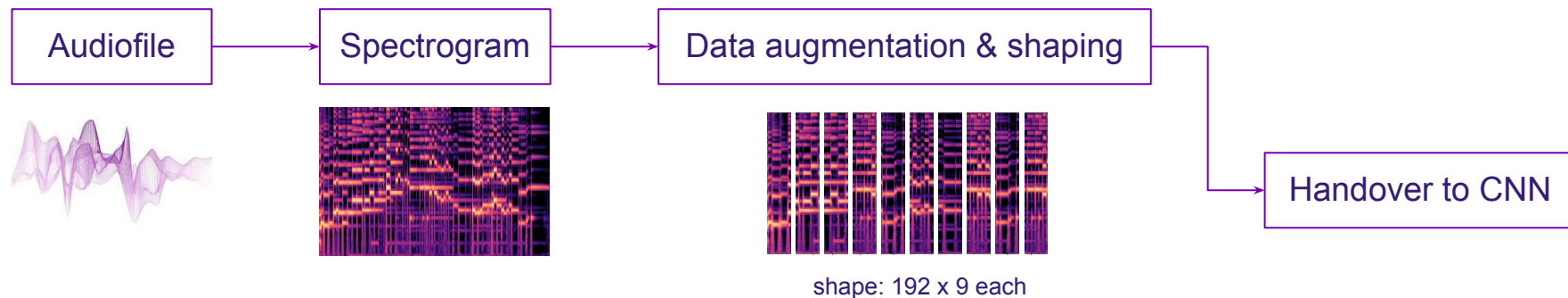
.jams

JSON based schema

Timestamped frequencies, MIDI notes, and durations

swizzle

How we do it

Training Input

.jams
.wav

Pre-processing

labels, audio

Model

CNN

Post-processing

Tab generation

Interface

Streamlit App

User input

Preprocessing

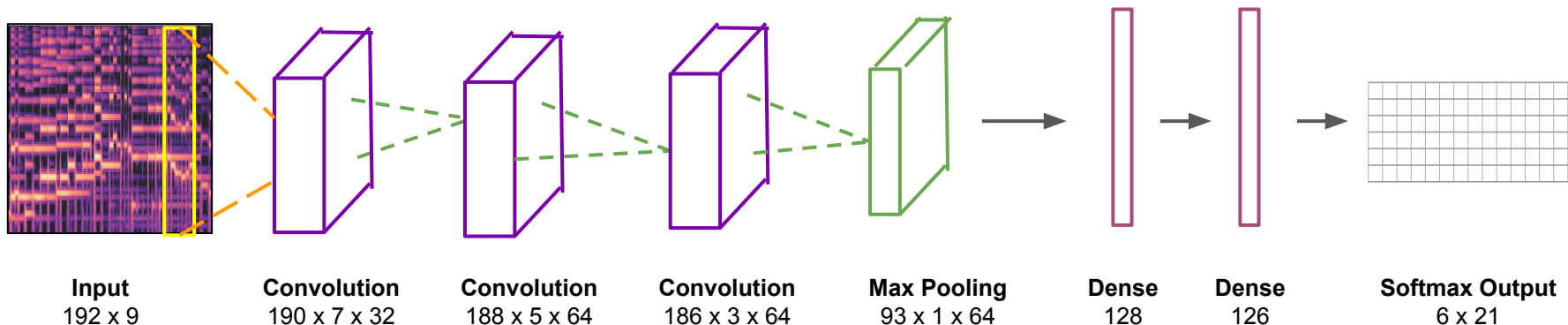| Audiofile | → | Spectrogram | → | Data augmentation & shaping | → | Handover to CNN |

shape: 192 x 9 each

During training, up to **360** audio files were processed
into over **470,000 images**
and combined with the **corresponding labels**

swizzle

CNN (Convolutional Neural Network) model

Input	Convolution	Convolution	Convolution	Max Pooling	Dense	Dense	Softmax Output
192 x 9	190 x 7 x 32	188 x 5 x 64	186 x 3 x 64	93 x 1 x 64	128	126	6 x 21

Sample Output

```
[1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]   E string ————----
[0. 0. 0. 0. 0. 0. 0. (1.) 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]   A string ————----
[1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]   D string ————----
[1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]   G string ————----
[1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]   B string ————----
[1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.]   e string ————----
```
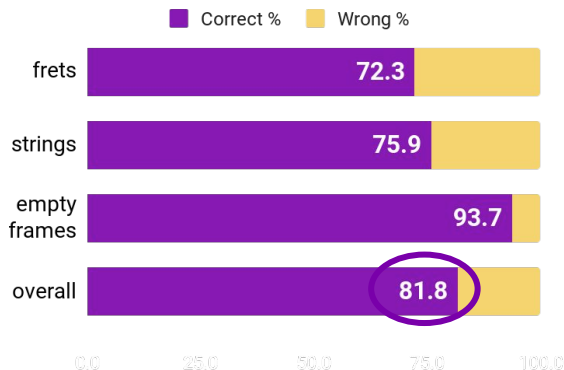
s\/\/izzle

Model evaluation & Error analysis

Model metrics:

Overall percentage of correctly predicted frames:

1. fret & strings fully correct ✔
2. empty strings correct ✔

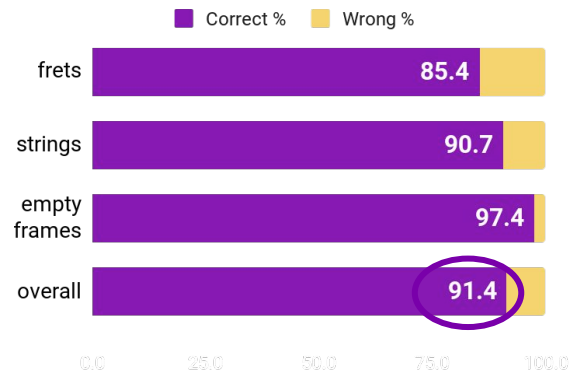## Percentage of correctness - All songs

■ Correct % ■ Wrong %

frets	72.3
strings	75.9
empty frames	93.7
overall	81.8

0.0　25.0　50.0　75.0　100.0

All songs: Solo tracks & Backing tracks

Where errors occur:

● Especially in predicting frets

Percentage of correctness - Solo songs

■ Correct % ■ Wrong %

frets	85.4
strings	90.7
empty frames	97.4
overall	91.4

0.0　25.0　50.0　75.0　100.0

Where the model shines:

● Solo songs

swizzle

swizzle App demo

swizzle

s/\/izzle

Upload your audio file

☁ **Drag and drop file here**
Limit 200MB per file • WAV

Browse files

Get your tabs!

swizzle it

This is the homepage of swizzle app. Here you can drag and drop your audio file or browse for it.

s/\/izzle

About

"swizzle" is a tool for musicians providing **AI generated music notation of songs**.

You can find the code on our Github

swizzle

Upload your audio file

Drag and drop file here
Limit 200MB per file • WAV

Browse files

📄 05_Rock3-117-Bb_solo_hex_cln.wav 17.4MB ✕

Get your tabs!

swizzle it

Have a look at the settings, e.g. to switch to dark mode or check our "About" if you want to know more

If you uploaded your file, you can check the name again. Then just swizzle it with the swizzle it button and get your tabs.

swizzle

13

About

"swizzle" is a tool for musicians providing **AI generated music notation of songs**.
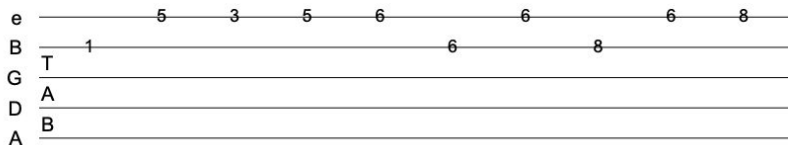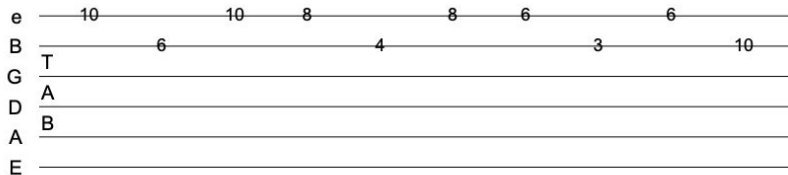
You can find the code on our [Github](#)

← go back home

s/\/izzle

Play your song

0:00   0:32

Song: 05_Rock3-117-Bb_solo_hex_cln.wav

Guitar tabs

Amazing! Now you got your tabs and you can listen to your audio file here. If you want to swizzle another song, press ← go back home on the left and go for it.

swizzle business value

our customer profiles

teachers	guitarists	hobbyists	composers

main benefits

Time saved
~30 min per song

Digitalized Tabs

Sharing option

future developments

- chord detection
- key & scale detection
- combine chords & lyrics

- live recording
- video processing

swizzle

swizzle

AI powered music notation of songs

about

"swizzle" is a tool for guitar players providing AI generated music notation of songs.

Stop wasting your time transcribing your music manually: Upload your own recording and let swizzle do its magic.

team contact

Ivy Zhaoxin Lu	https://www.linkedin.com/in/zhaoxin-lu/
Florian Herr	TBD
Sebastian Nagel	https://www.linkedin.com/in/sebastiannagel1991/
Matthias Herrmann	https://www.linkedin.com/in/matthiasherrmann74/

swizzle

Thank you for your interest!
Feel free to contact us.