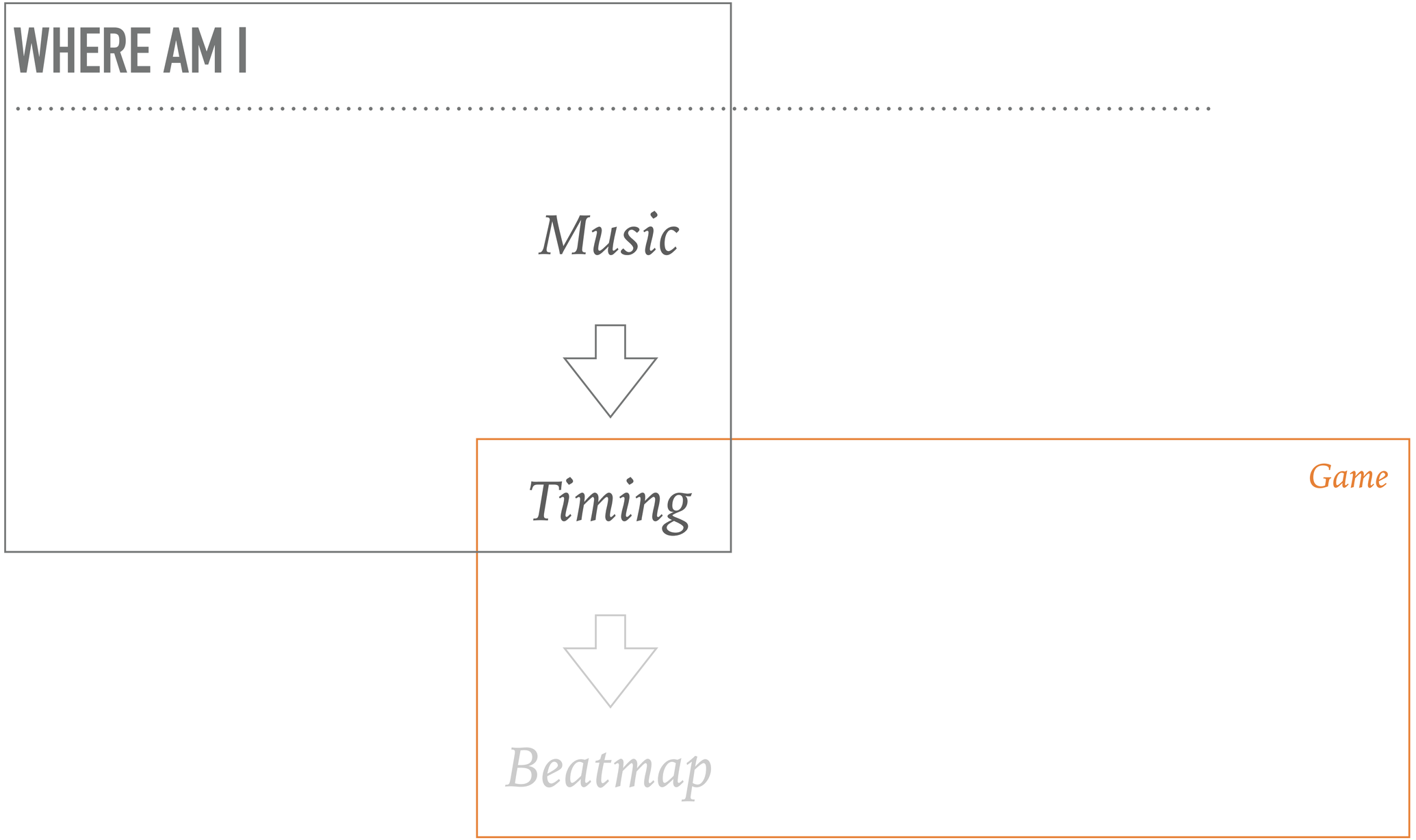
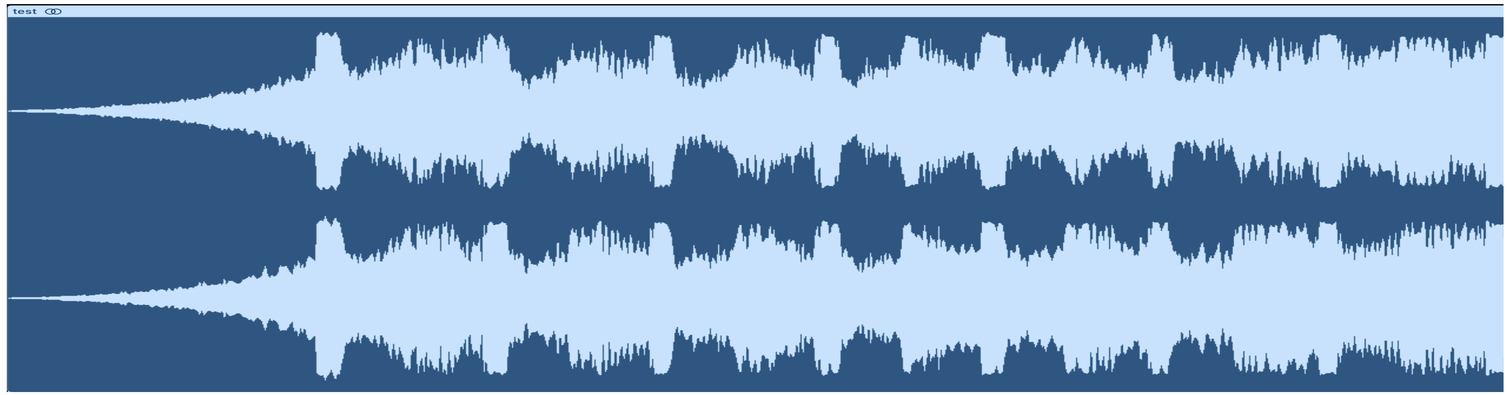
OSU MAPPING – BEAT EXTRACTION

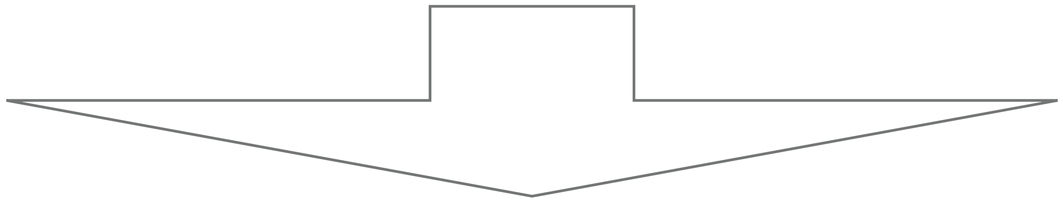
Willian Zhang

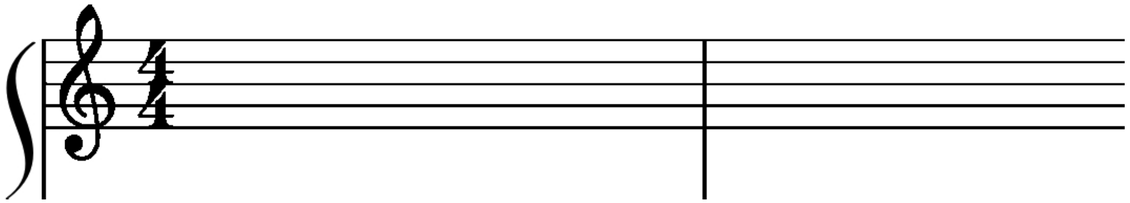

WHERE AM I
Music
Timing
Game
Beatmap

PROBLEM



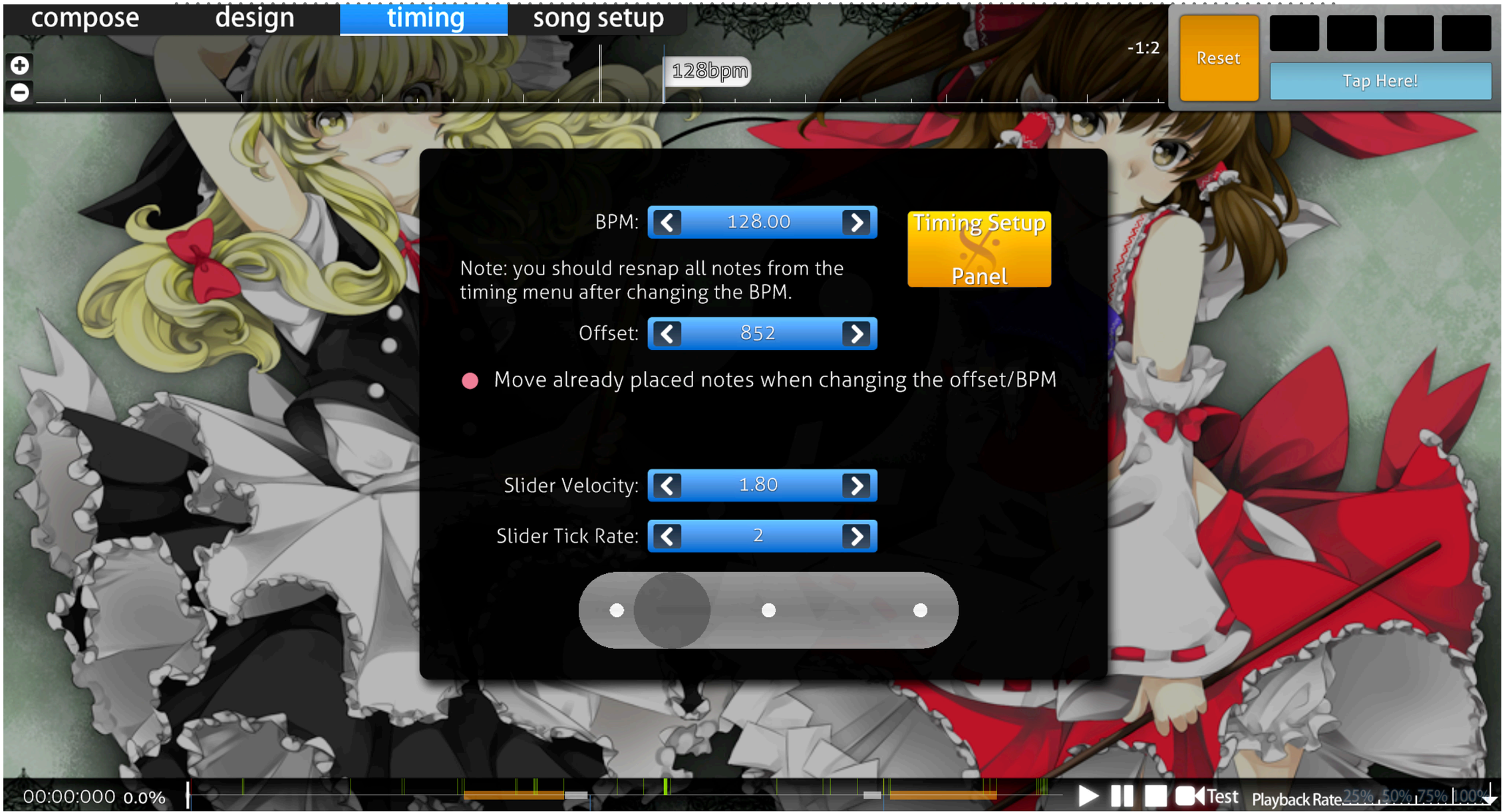
Audio File



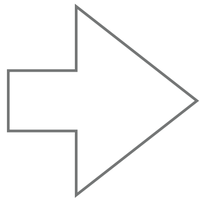


Timing Points

PROBLEM (DEMO)



PROBLEM (CONT.)

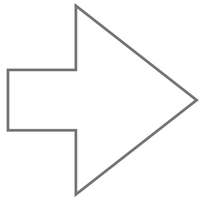


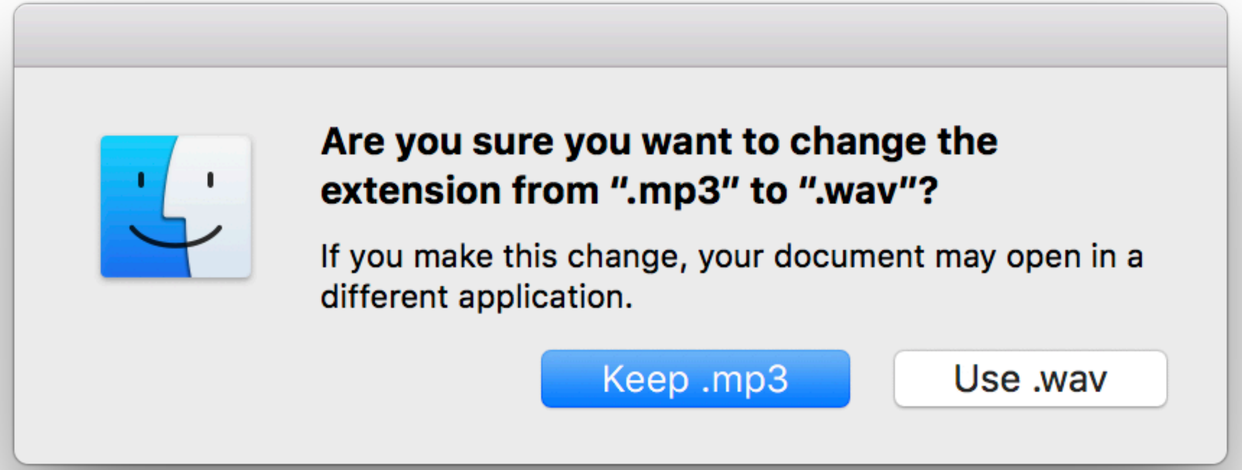
cYsmix feat. Emmy - Tear Rain (jonathanlfj) [Normal].osu

```
53  [TimingPoints]
54  852.123875140607,468.75,4,2,1,50,1,0
55  15852,-100,4,3,1,60,0,0
56  45852,-100,4,2,1,50,0,0
57  60383,-100,4,2,1,55,0,0
58  60852,-100,4,2,1,60,0,0
59  75852,-100,4,3,1,60,0,0
60  77258,-100,4,3,1,80,0,0
61  77727,-90.9090909090909,4,3,1,80,0,1
62  97414,-90.9090909090909,4,3,1,70,0,1
63  97648,-90.9090909090909,4,3,1,60,0,1
64  97883,-90.9090909090909,4,3,1,50,0,1
65  98352,-90.9090909090909,4,3,1,80,0,1
66  105852,-100,4,2,1,60,0,0
67  120852,-100,4,2,1,50,0,0
68  133977,-100,4,3,1,70,0,0
```

0 0 Ln 1, Col 1 Spaces: 4 UTF-8 CRLF Ini

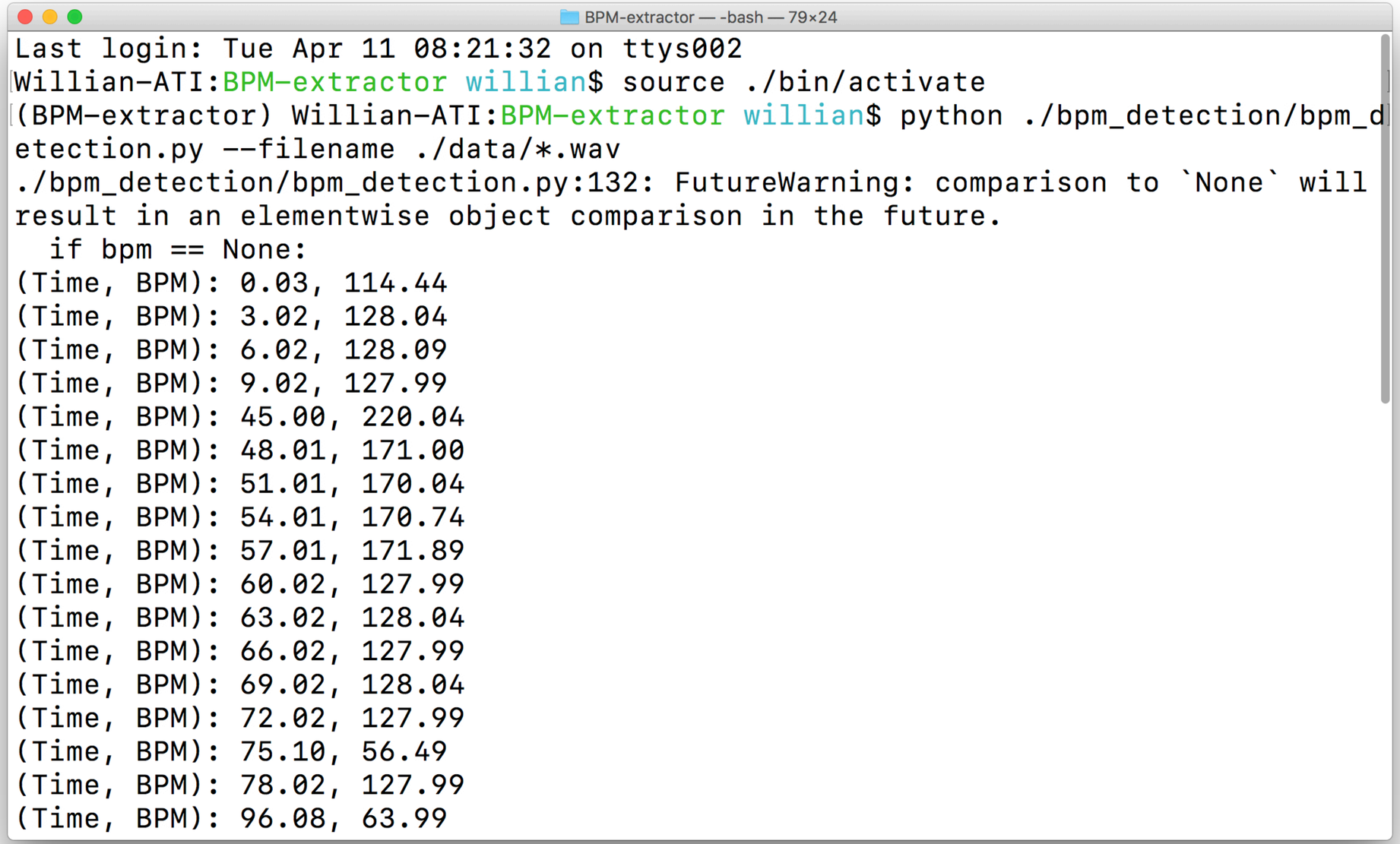
FORMAT



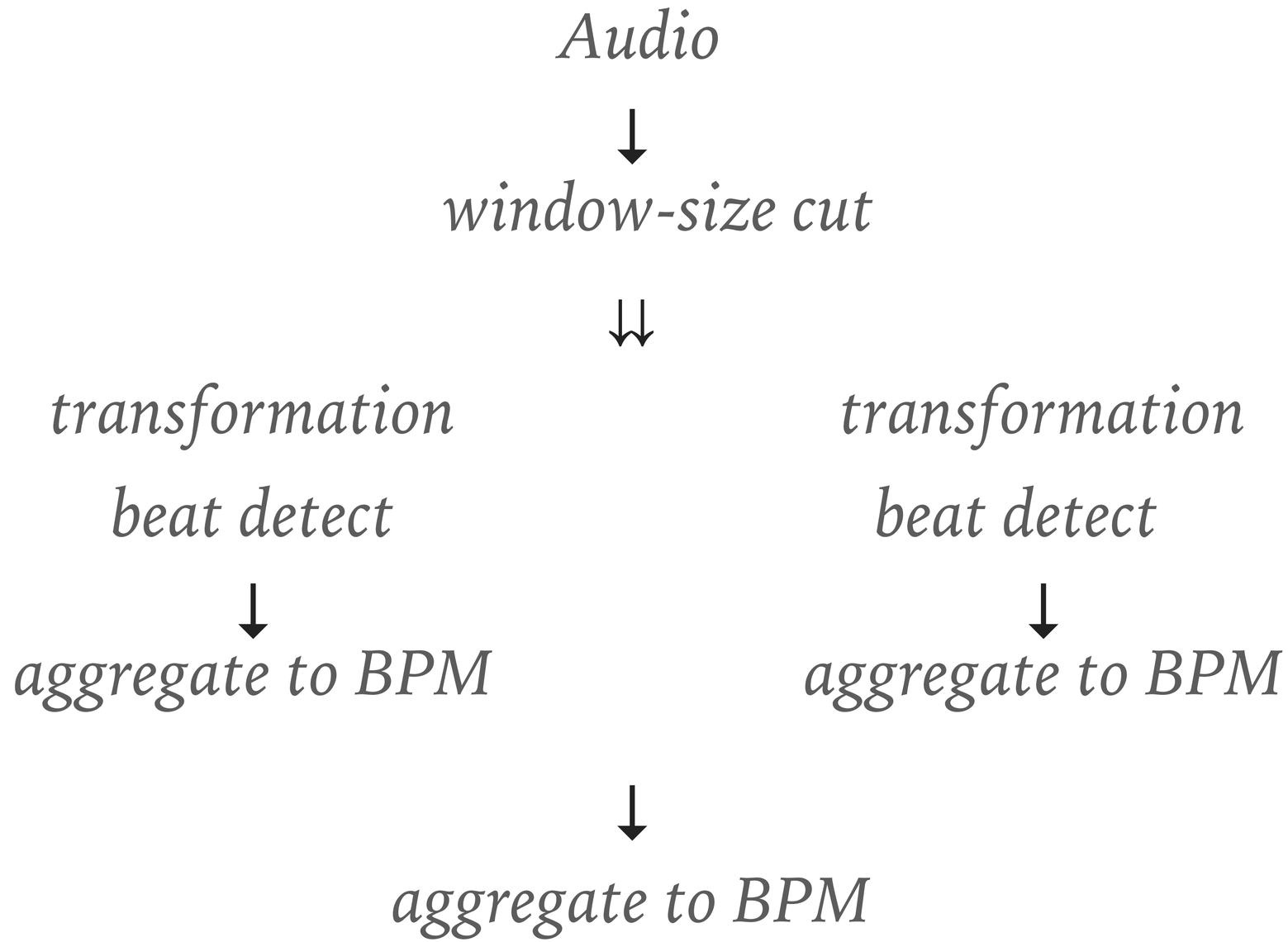


I use Linux tool `mpg123` to do this

NOW EXTRACT!


BPM-extractor — -bash — 79×24
Last login: Tue Apr 11 08:21:32 on ttys002
Willian-ATI:BPM-extractor willian$ source ./bin/activate
(BPM-extractor) Willian-ATI:BPM-extractor willian$ python ./bpm_detection/bpm_detection.py --filename ./data/*.wav
./bpm_detection/bpm_detection.py:132: FutureWarning: comparison to `None` will result in an elementwise object comparison in the future.
if bpm == None:
(Time, BPM): 0.03, 114.44
(Time, BPM): 3.02, 128.04
(Time, BPM): 6.02, 128.09
(Time, BPM): 9.02, 127.99
(Time, BPM): 45.00, 220.04
(Time, BPM): 48.01, 171.00
(Time, BPM): 51.01, 170.04
(Time, BPM): 54.01, 170.74
(Time, BPM): 57.01, 171.89
(Time, BPM): 60.02, 127.99
(Time, BPM): 63.02, 128.04
(Time, BPM): 66.02, 127.99
(Time, BPM): 69.02, 128.04
(Time, BPM): 72.02, 127.99
(Time, BPM): 75.10, 56.49
(Time, BPM): 78.02, 127.99
(Time, BPM): 96.08, 63.99

ALGORITHM


Audio
window-size cut
transformation
beat detect
aggregate to BPM
transformation
beat detect
aggregate to BPM
aggregate to BPM

ALGORITHM(CONT.)

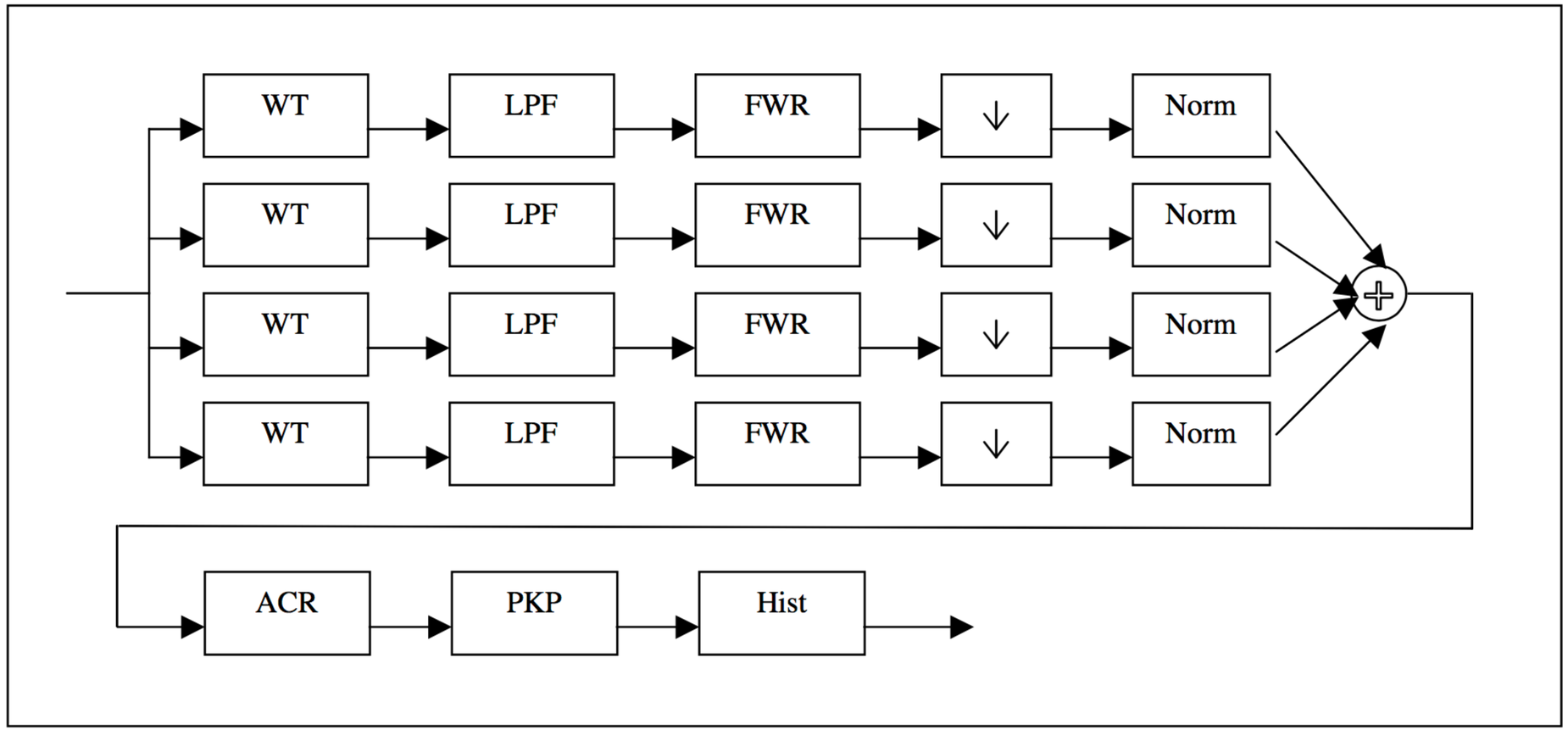
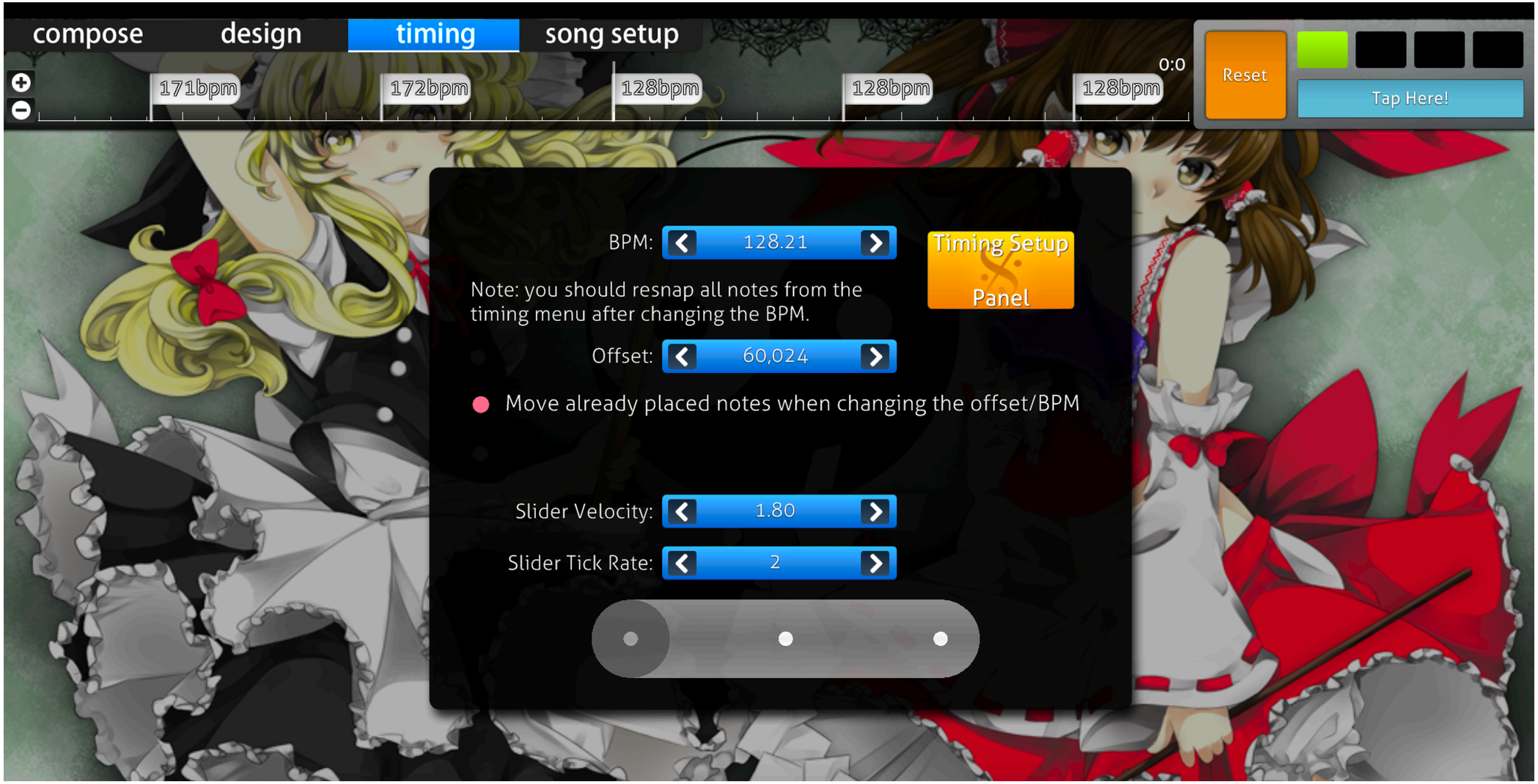


Figure 2: Block-diagram of beat-detection algorithm based on the Discrete Wavelet Transform (DWT).

http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.63.5712

TEST RUN

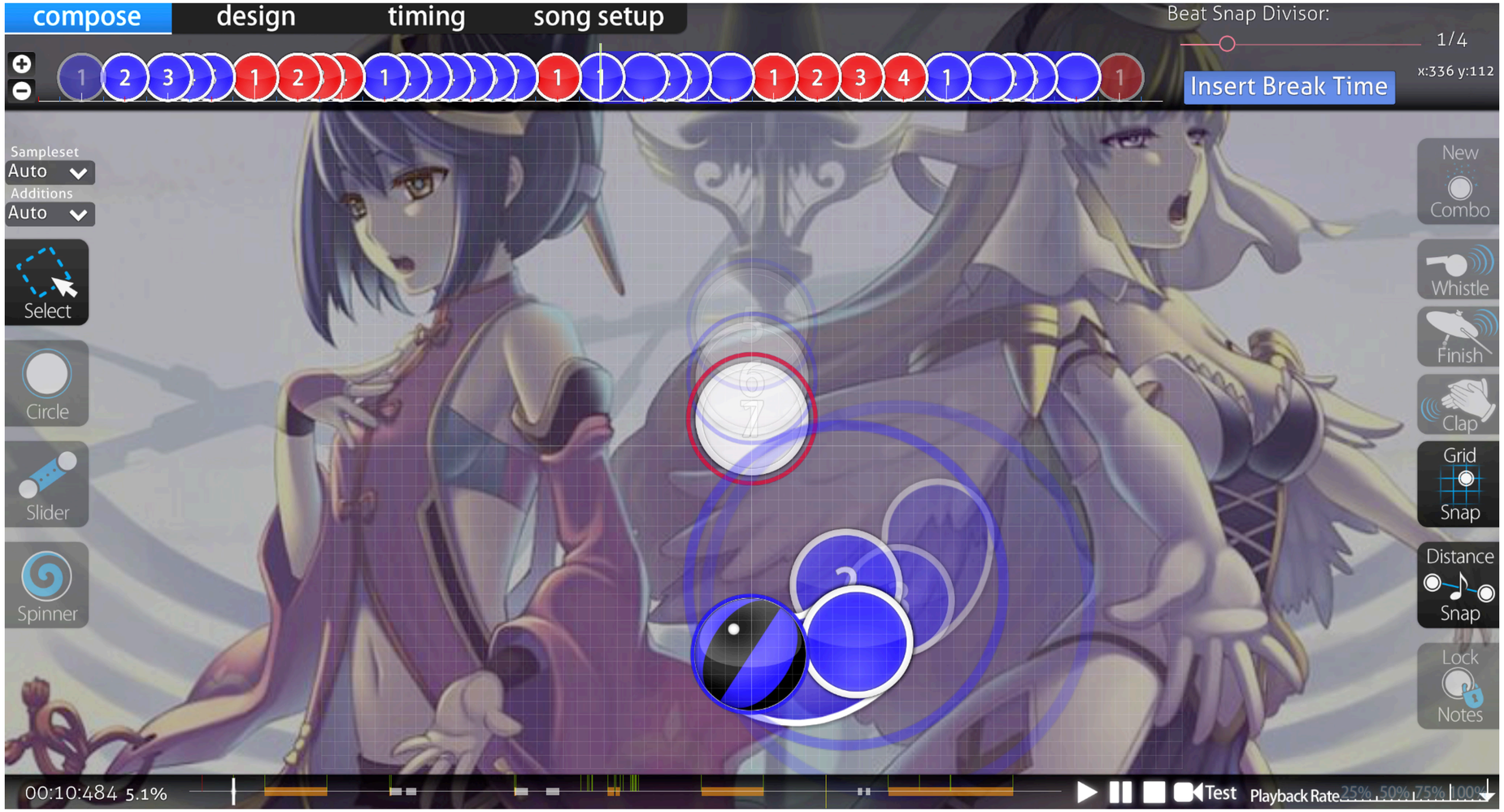

compose
design
timing
song setup
171bpm
172bpm
128bpm
128bpm
128bpm
0:0
Reset
Tap Here!
BPM:
128.21
Timing Setup & Panel
Note: you should resnap all notes from the timing menu after changing the BPM.
Offset:
60,024
Move already placed notes when changing the offset/BPM
Slider Velocity:
1.80
Slider Tick Rate:
2

TO IMPROVE

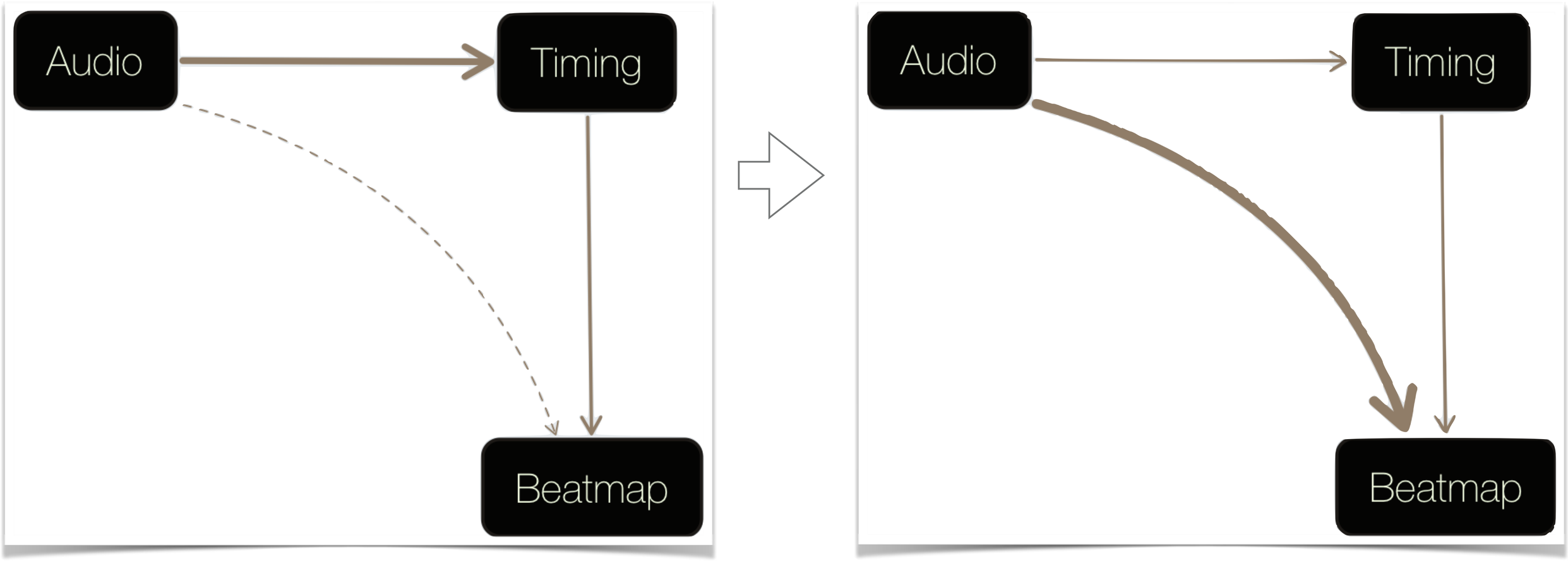
- More fit to real world: BPM change detection etc.
- And.

WHAT ELSE?

- A Good beatmap does lot more than just `generating placings from timing`



WHAT ELSE? (CONT.)



WHAT ELSE? (CONT.)

- We need more **features from audio**!
  (All beats, different instruments, different window size, etc.)
- Build **model** for features!
  (CNN, LSTM etc.)

THANKS