

Unmixer

An interface for extracting
and remixing loops



Jordan B. L. Smith

Yuta Kawasaki

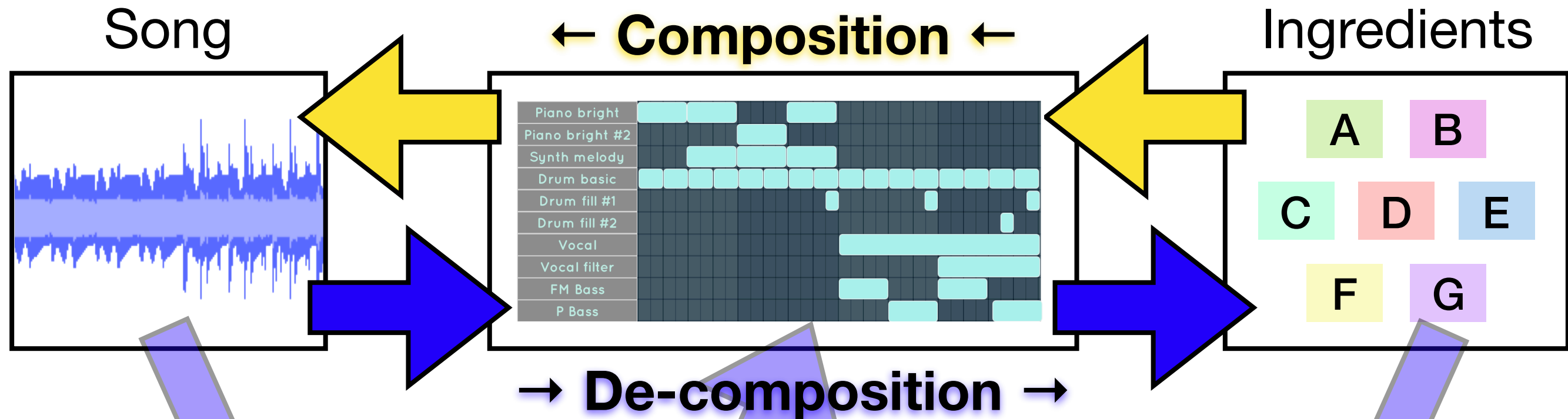
Masataka Goto



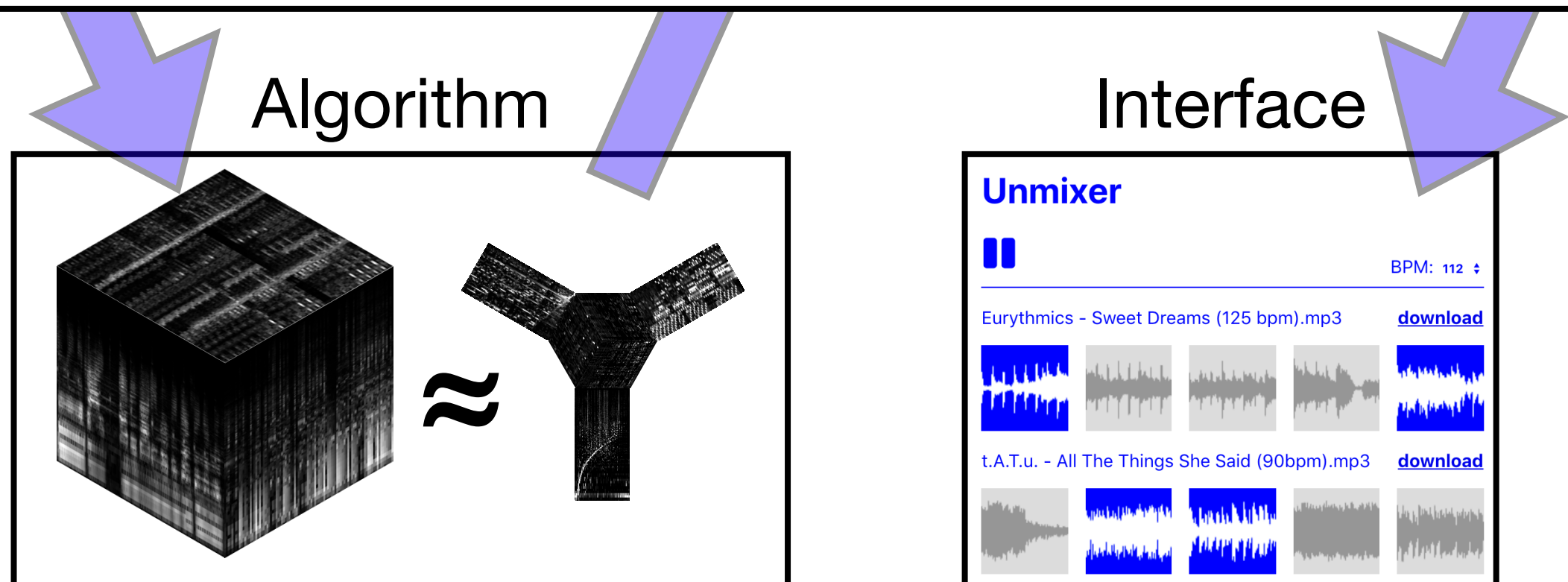
**Suppose you are a
remix artist...**

Remix artists have the STEREO MIX...

**...but they want the
ISOLATED LOOPS.**



Goal of **Unmixer**: extract loops from mixed audio



Unmixer Interface

1. User uploads audio file
2. Wait for results (several minutes)
3. Click tiles to add or remove them from the mix
4. Add more songs, test out mashups
5. Adjust tempo
6. Download loops to remix in your favourite DAW

Unmixer

An interface for extracting and remixing loops

[What is Unmixer?](#)

Quick Start

Unmix and isolate loops

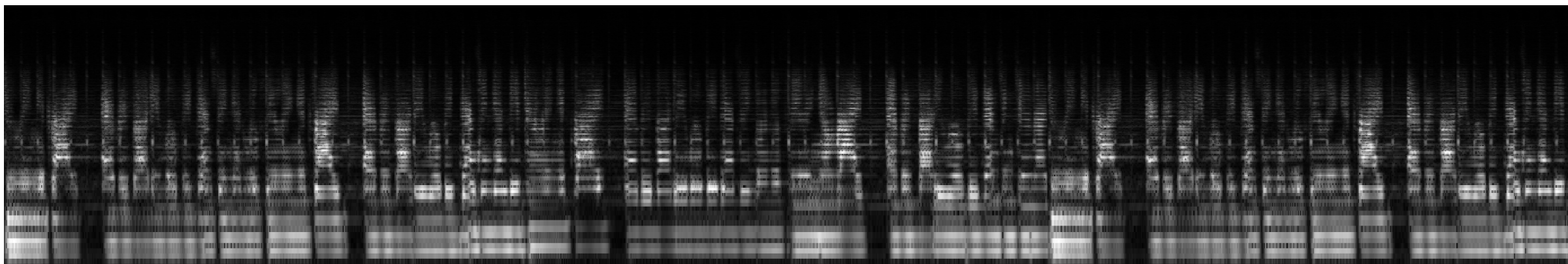
Try dropping an audio file here, or click to select an audio file to upload.

Unmixer Algorithm

Algorithm

1. Compute spectrum

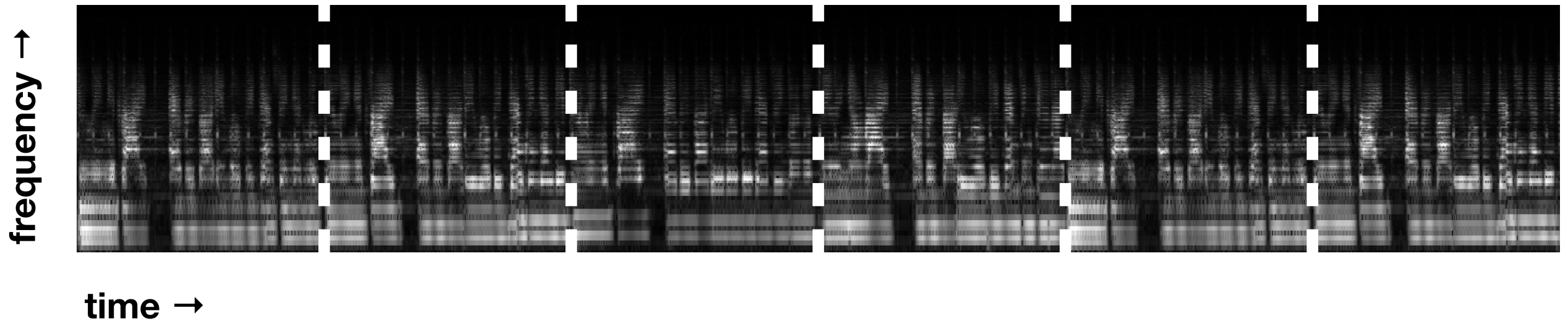
frequency →



time →

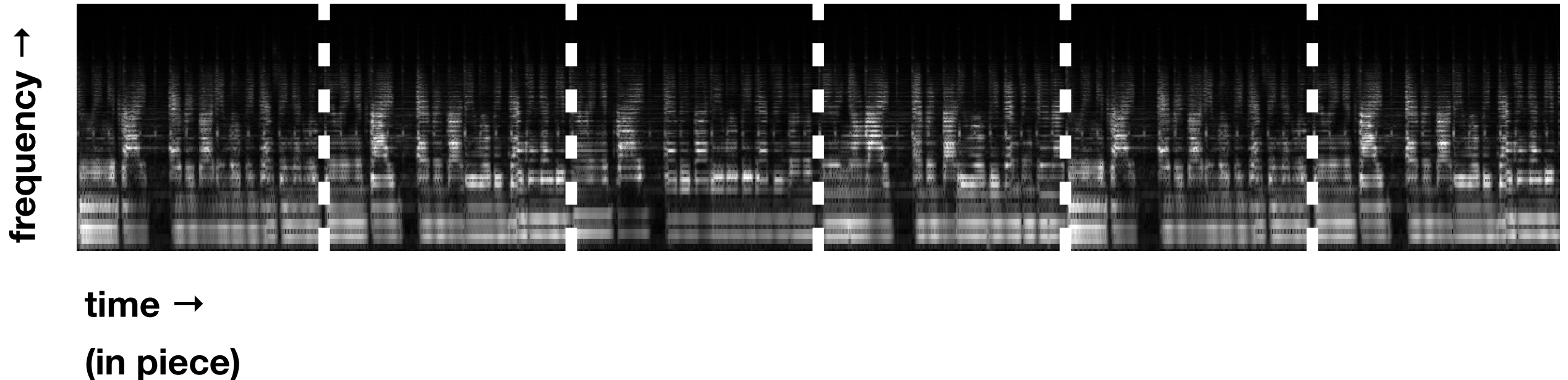
Algorithm

1. Compute spectrum
2. Estimate downbeats (madmom)



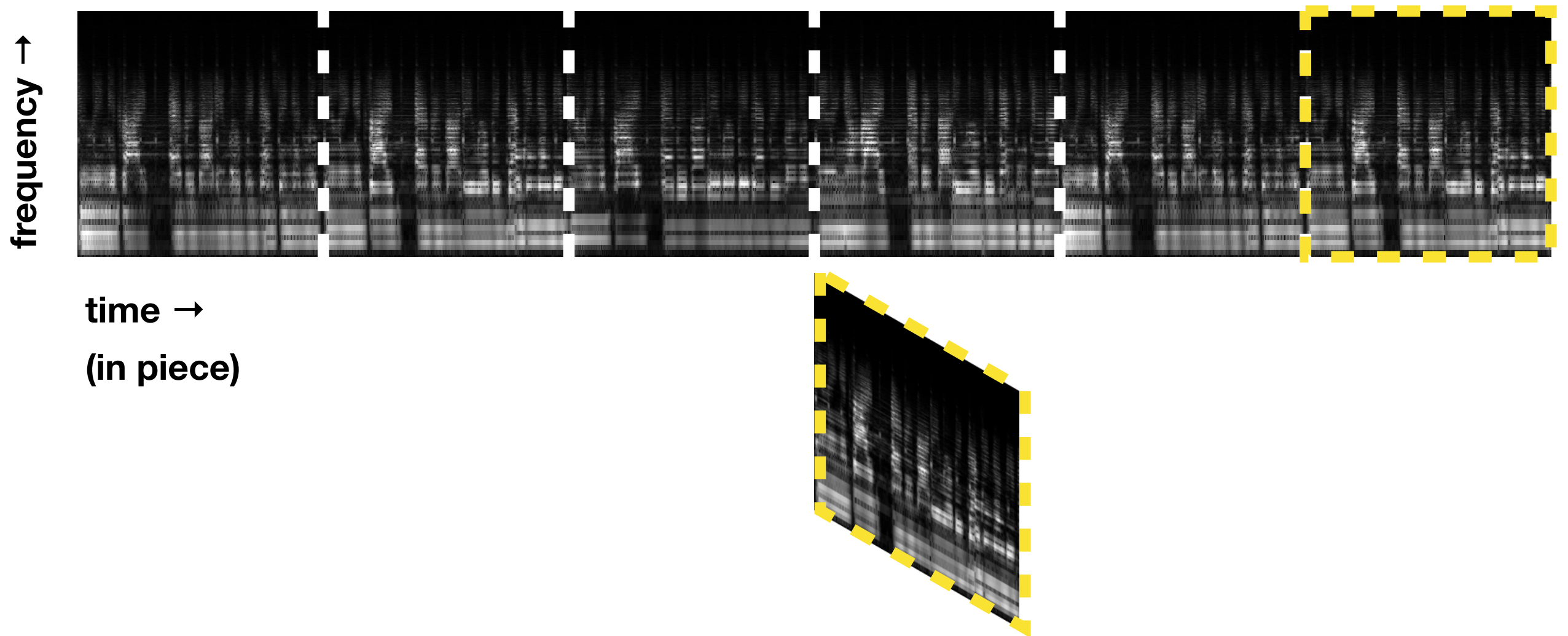
Algorithm

1. Compute spectrum
2. Estimate downbeats (madmom)
3. Stack into cube



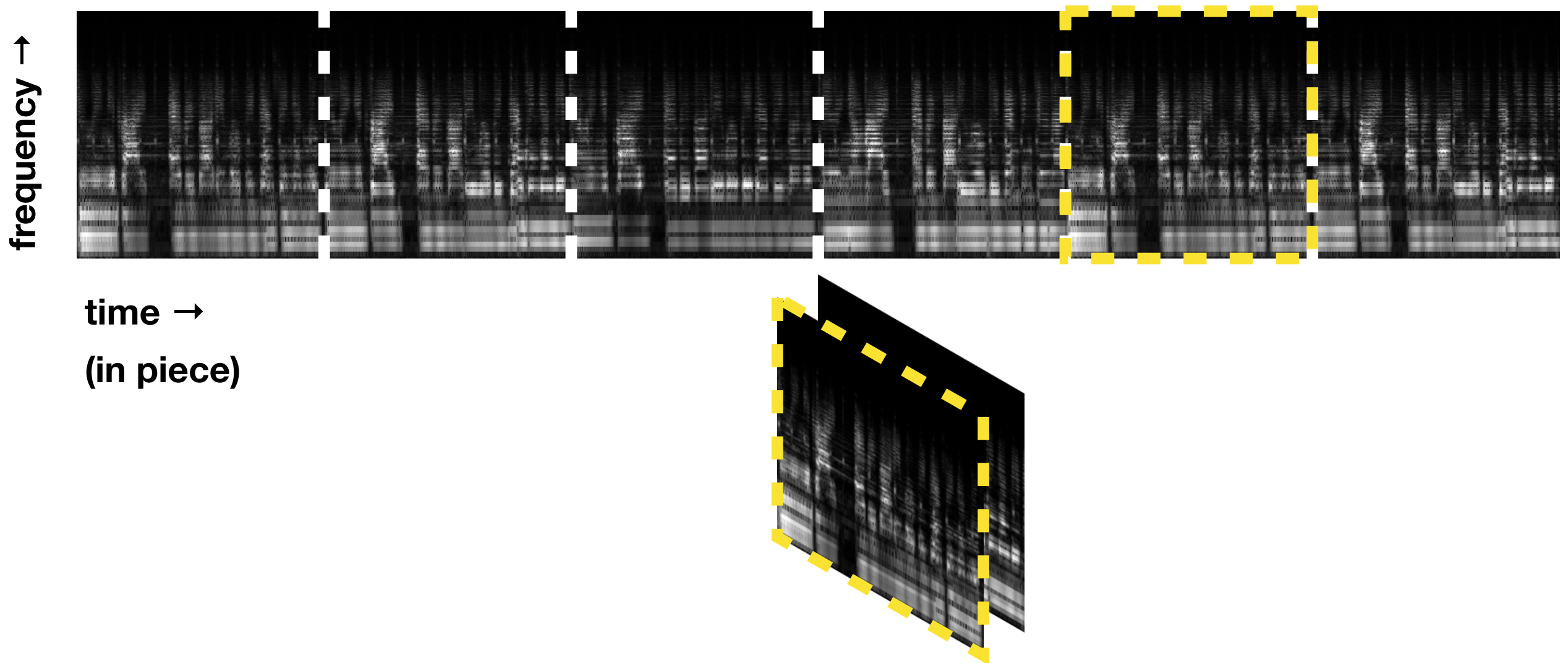
Algorithm

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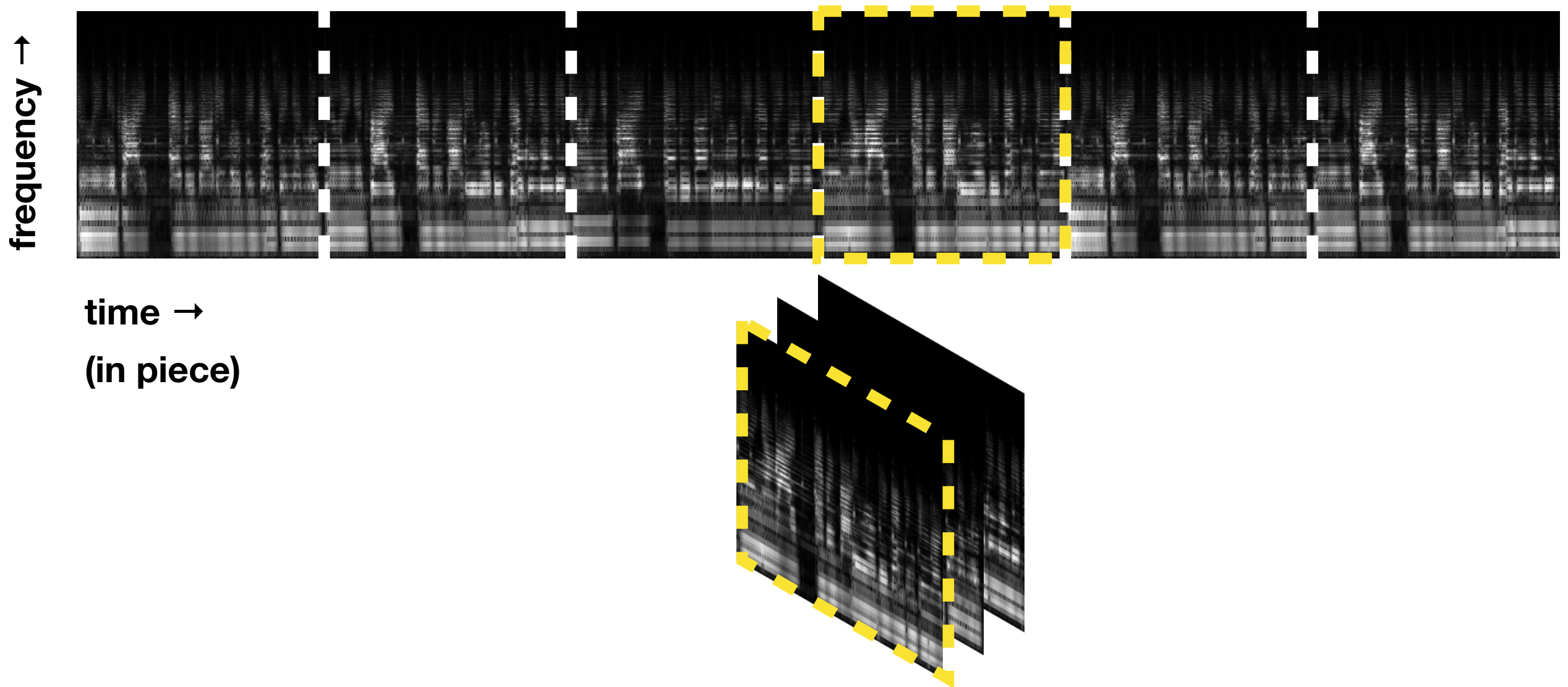
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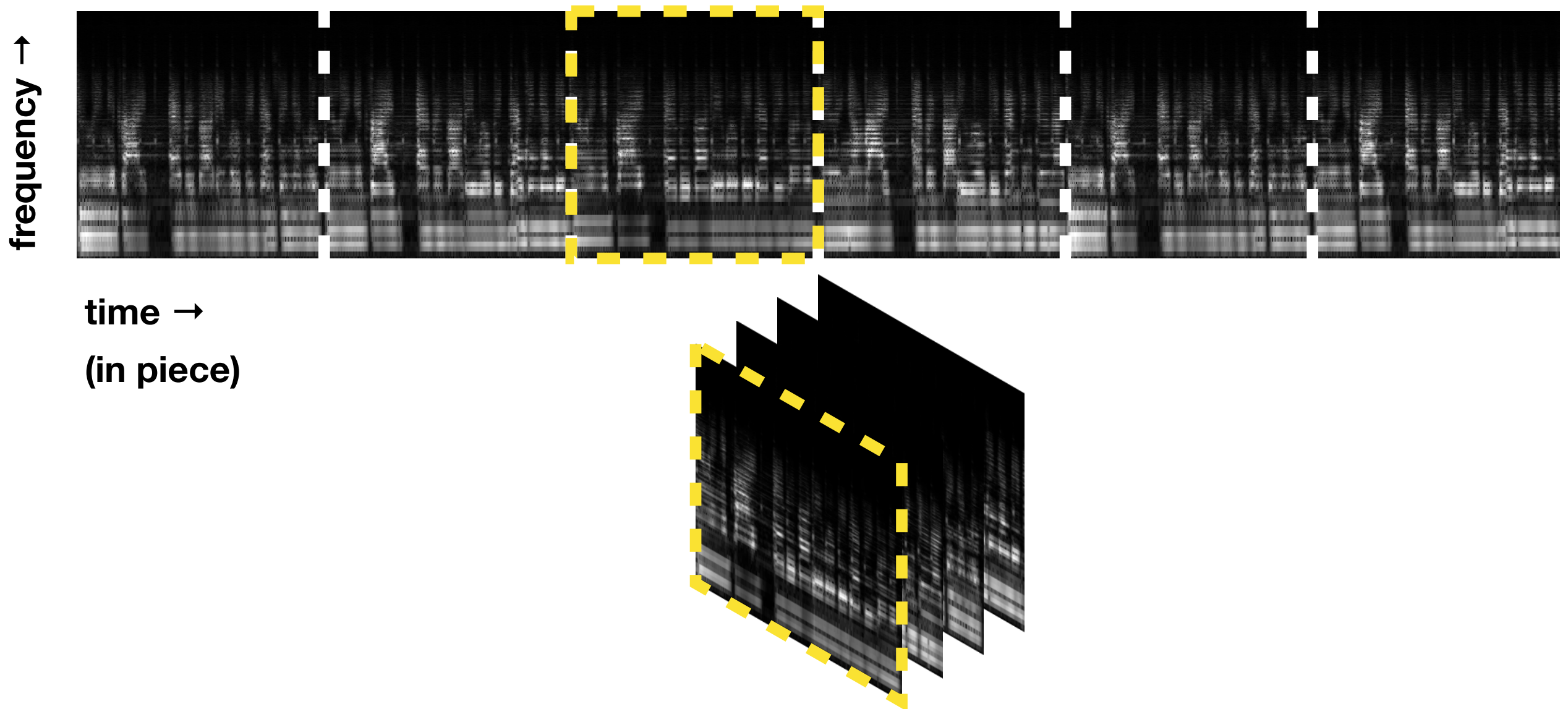
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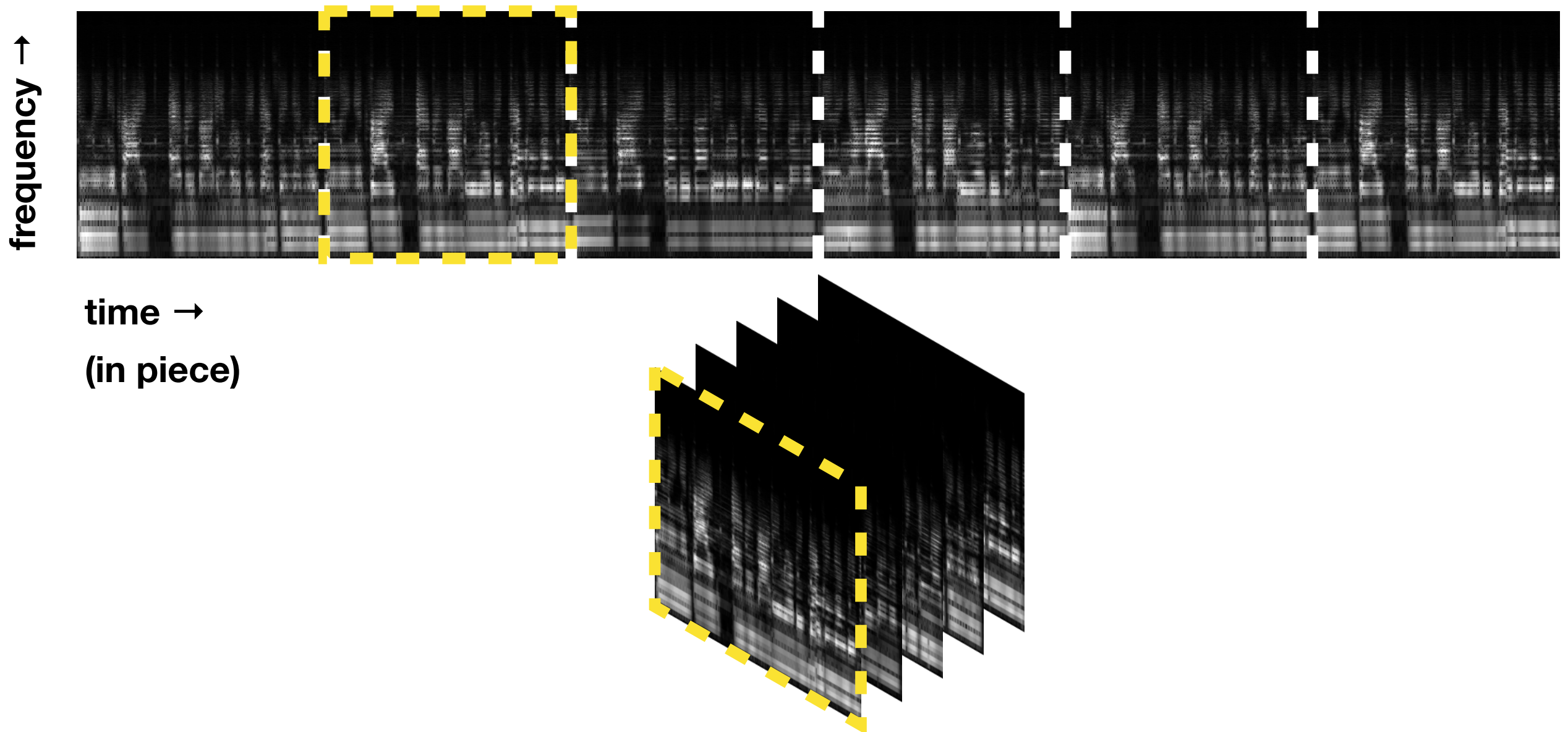
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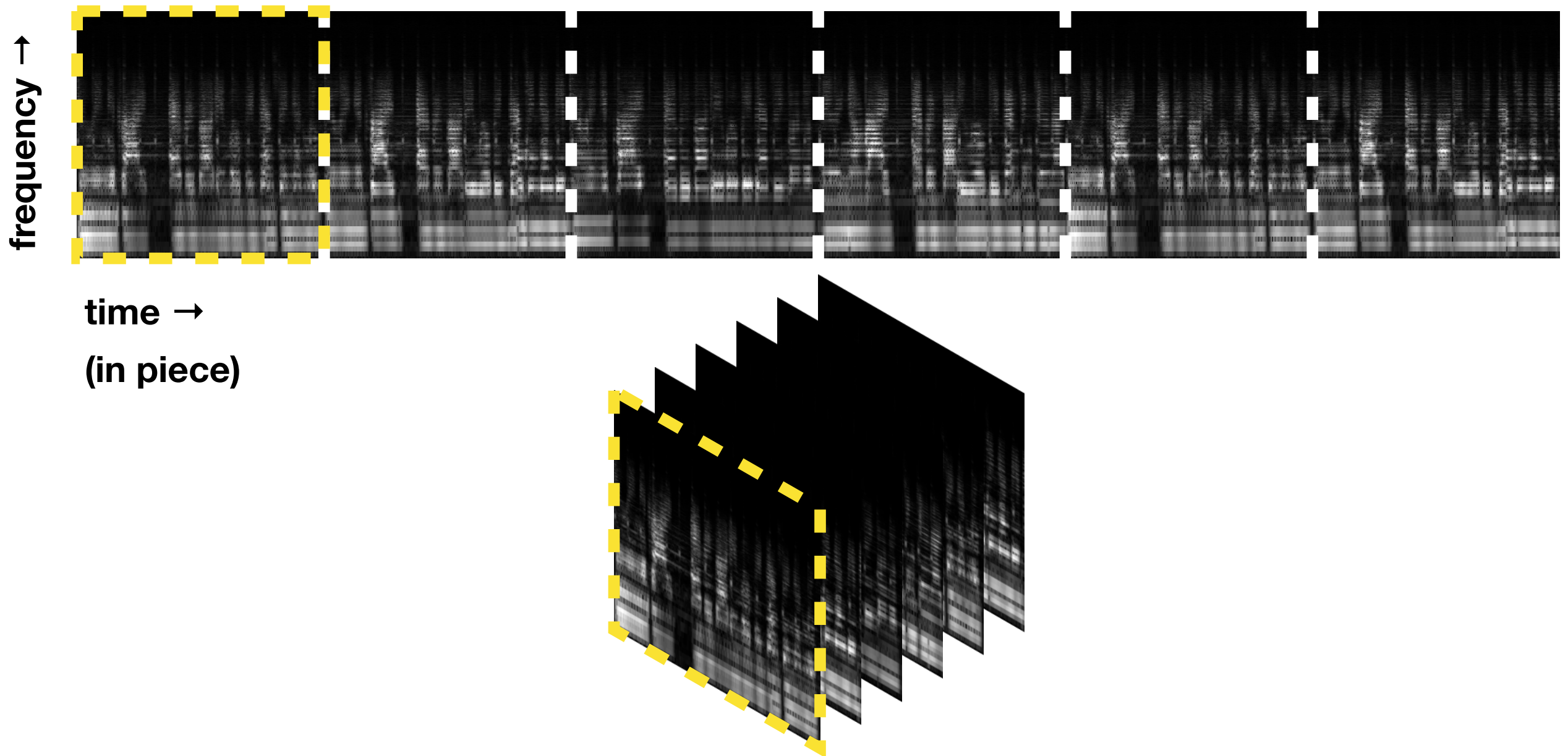
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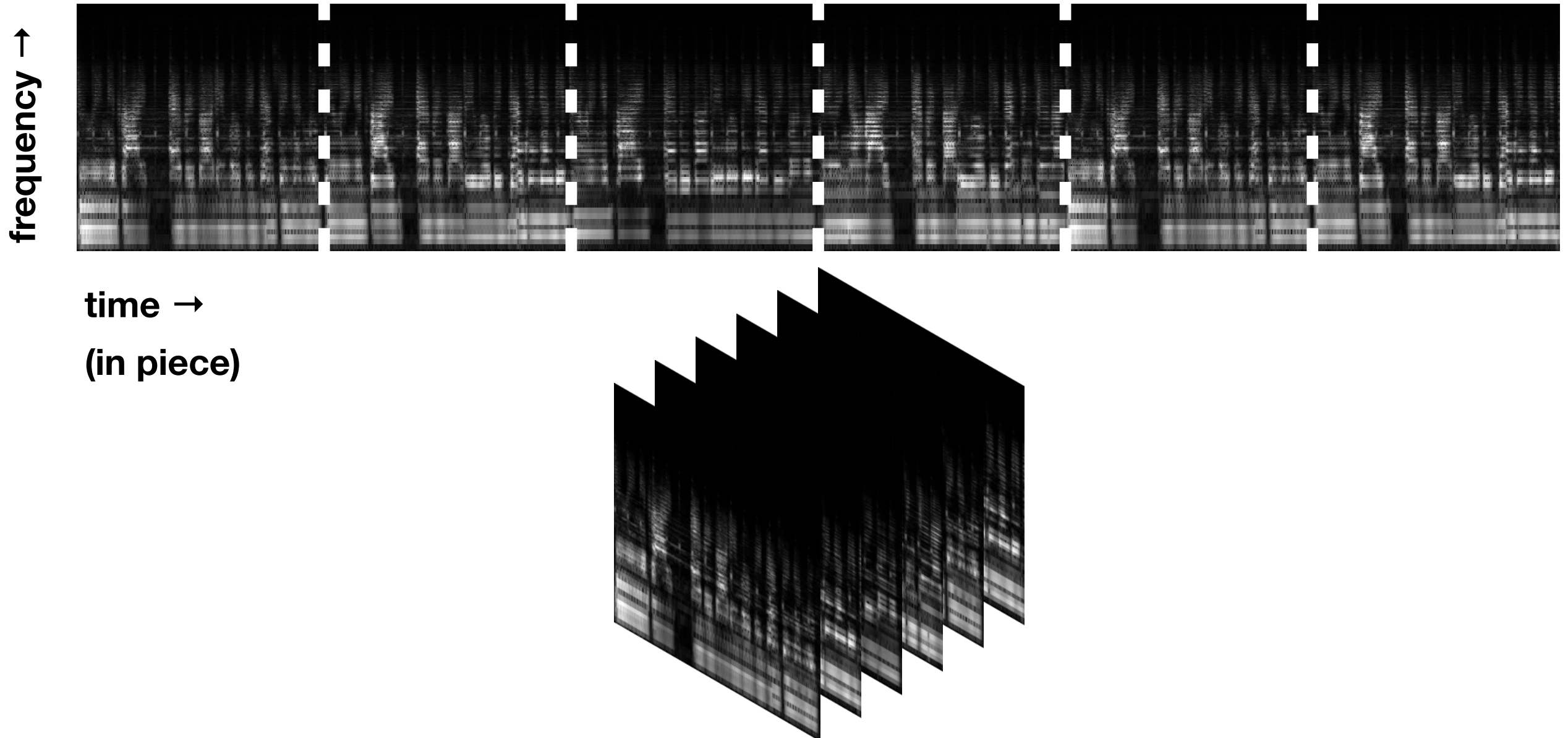
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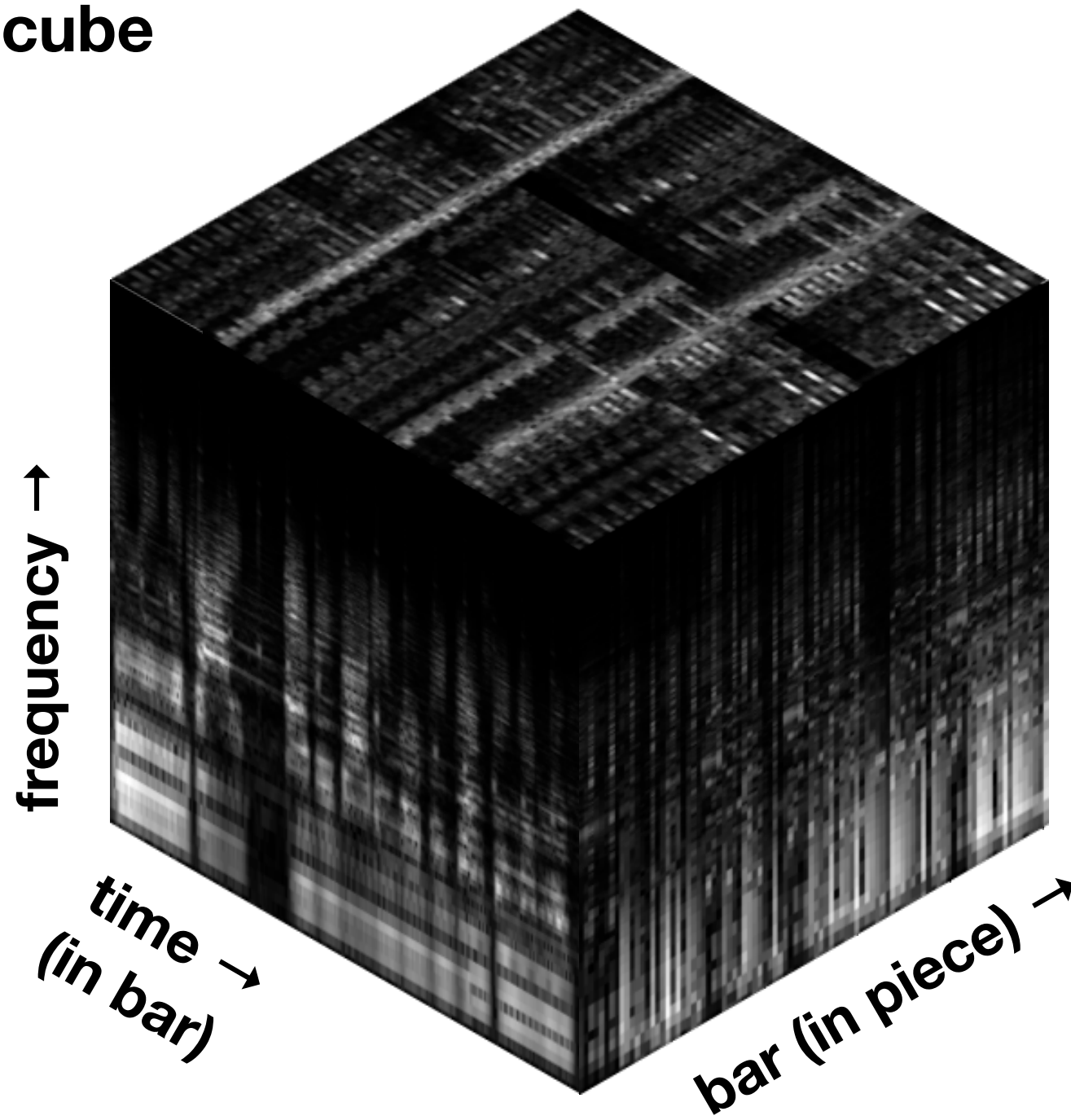
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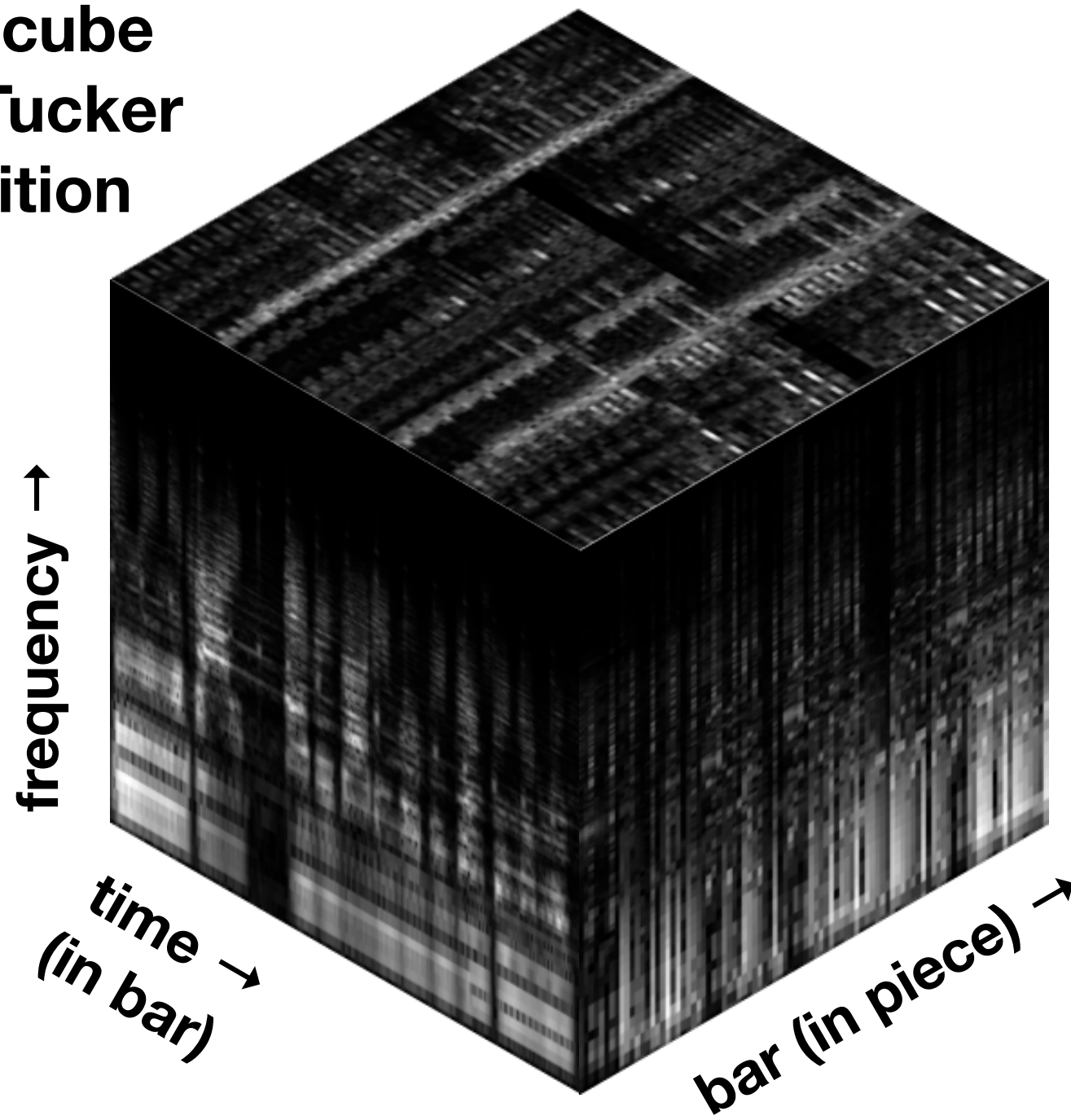
Algorithm

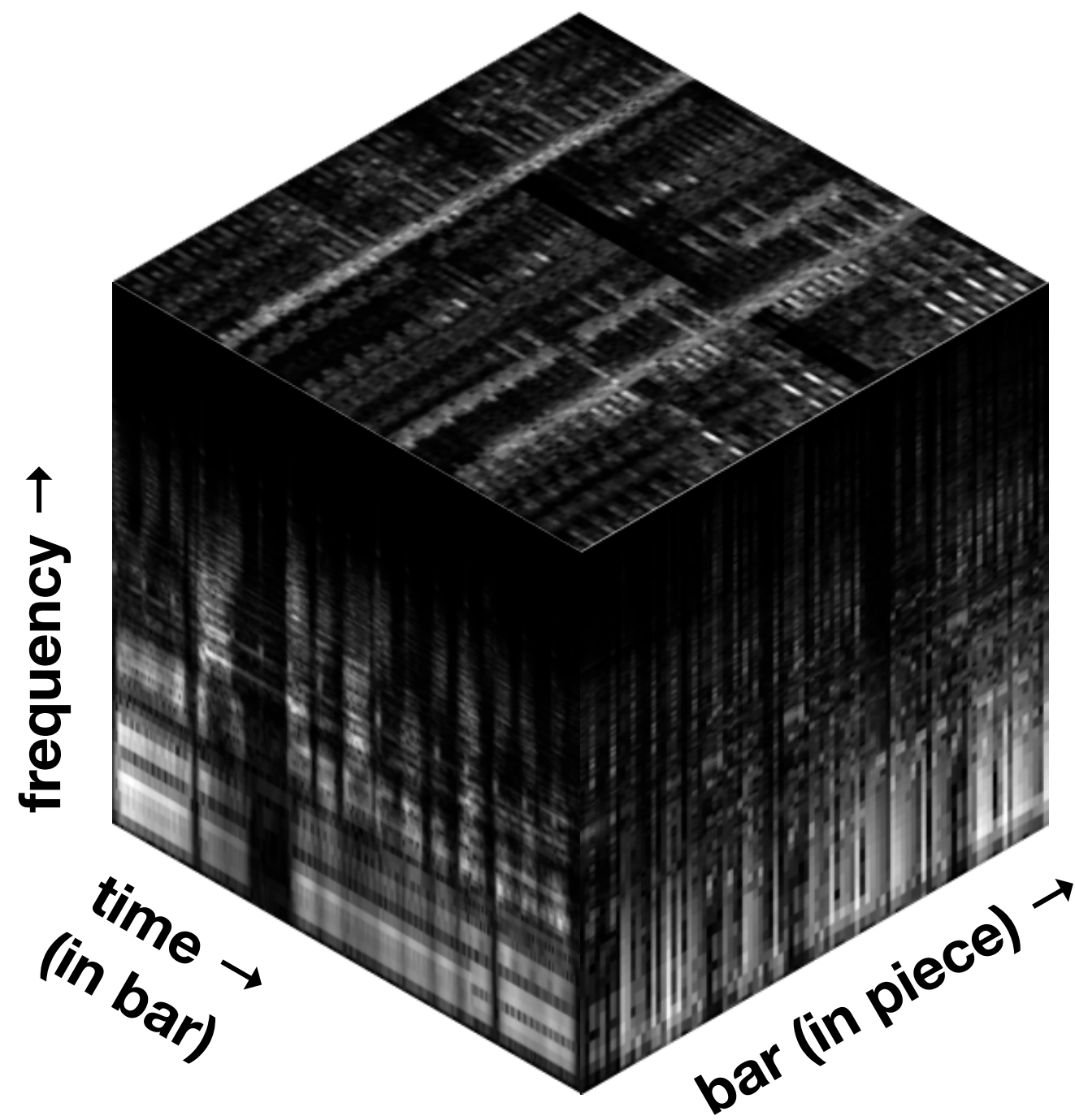
1. Compute spectrum
2. Estimate downbeats (madmom)
3. Stack into cube



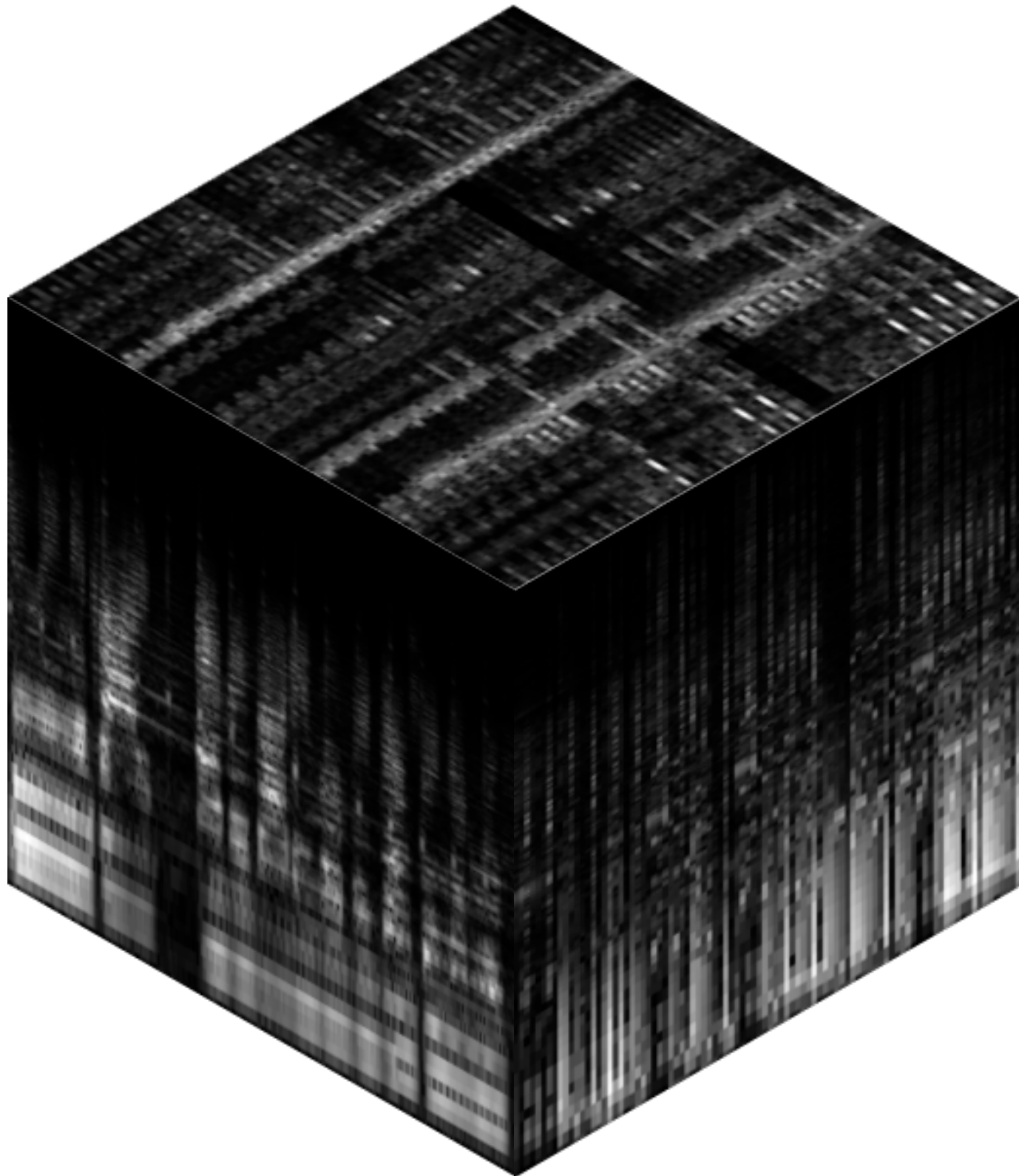
Algorithm

1. Compute spectrum
2. Estimate downbeats (madmom)
3. Stack into cube
4. Compute Tucker decomposition

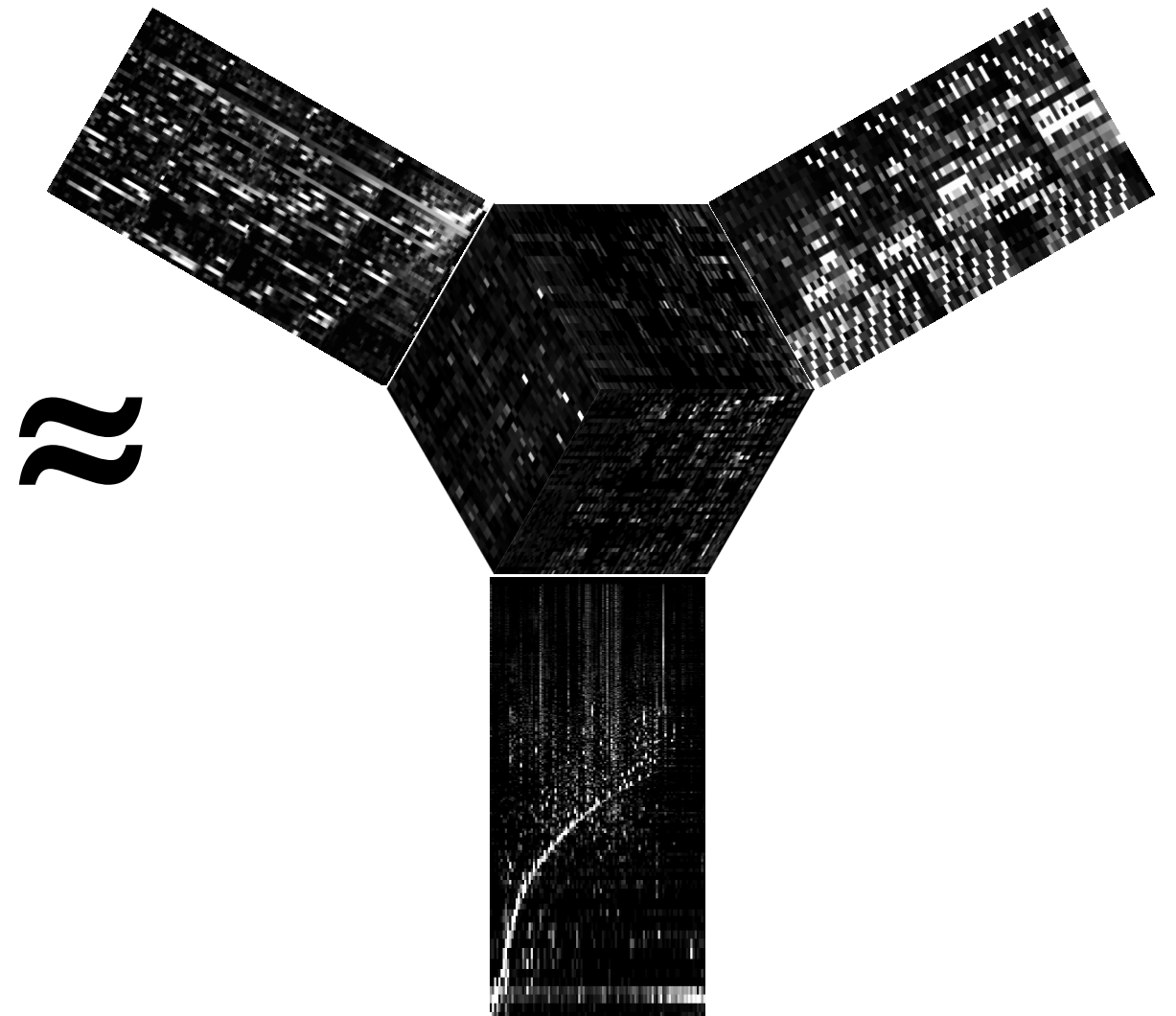




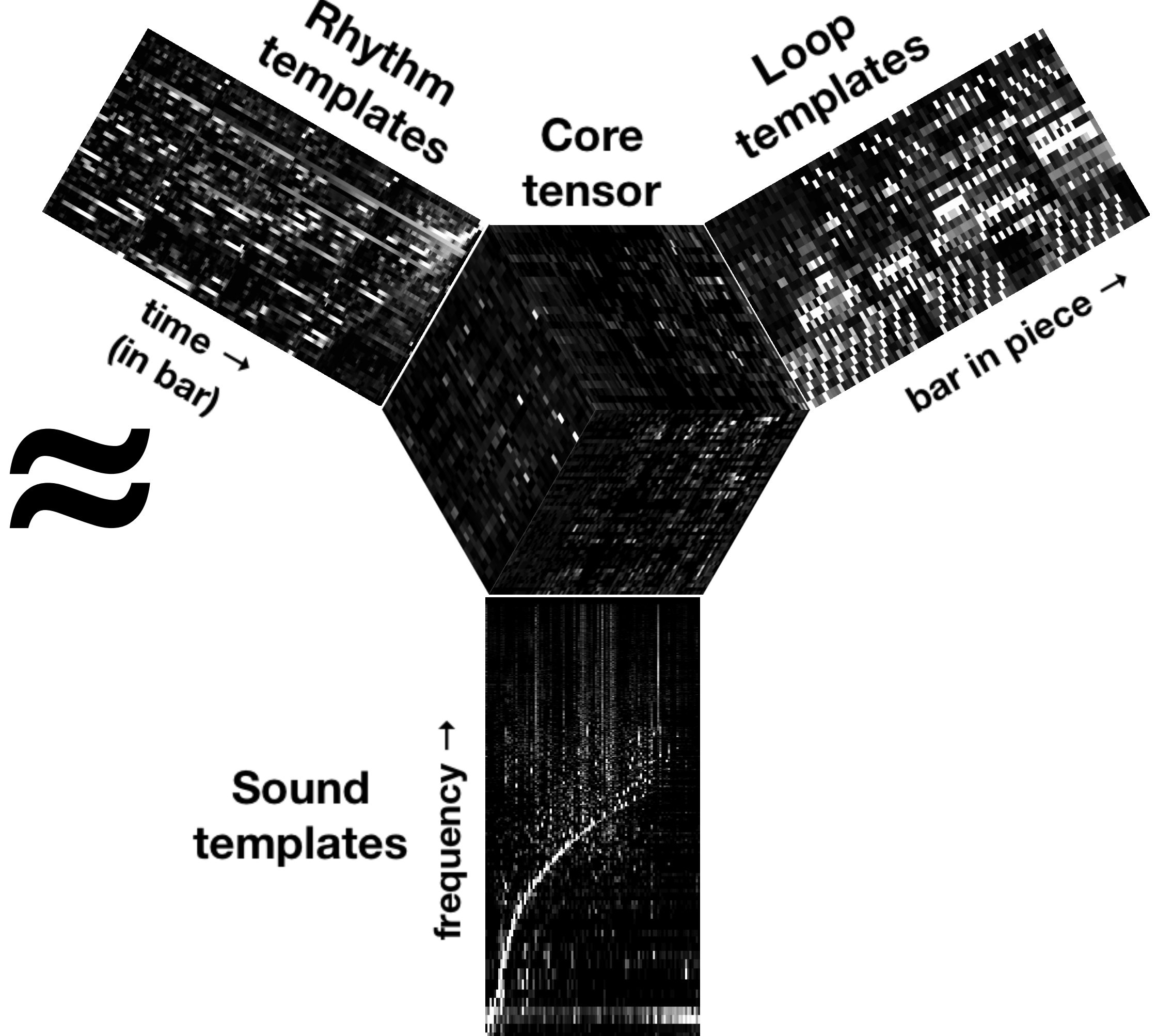
Tucker decomposition:

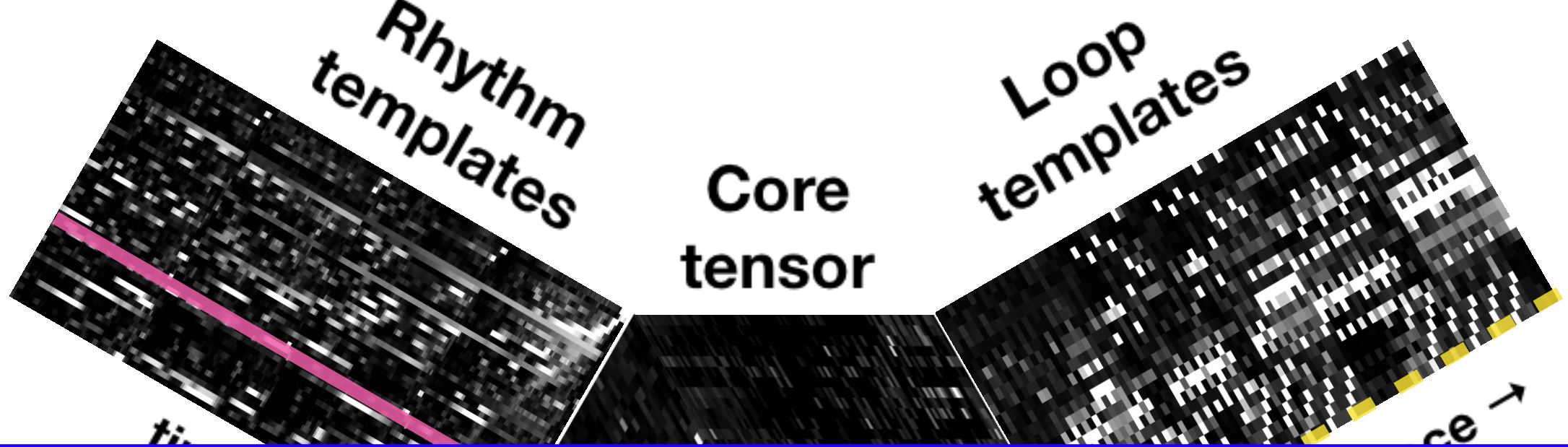


Spectral cube
~20M elements



Core tensor and 3 templates
~0.2M elements

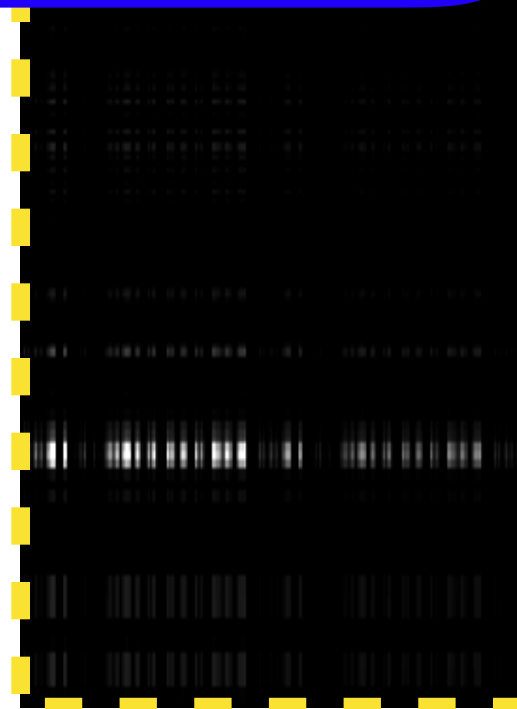
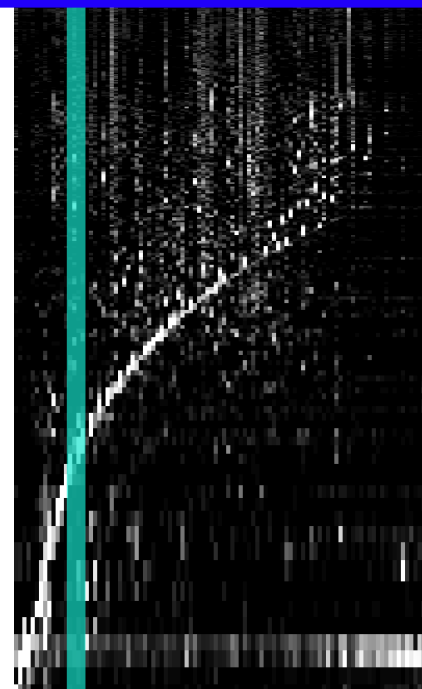


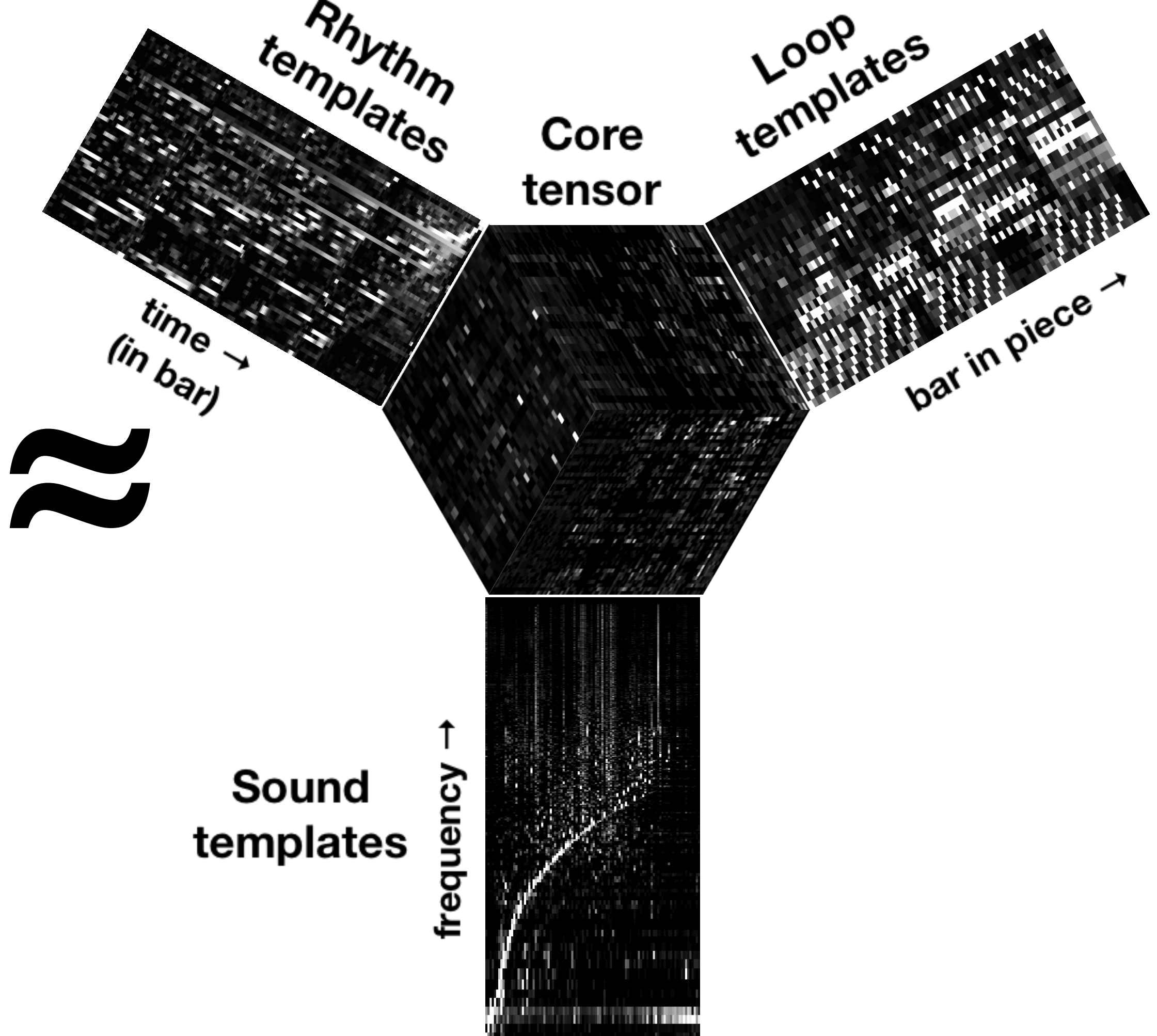


**VISIT POSTER
FOR BONUS SLIDES!**

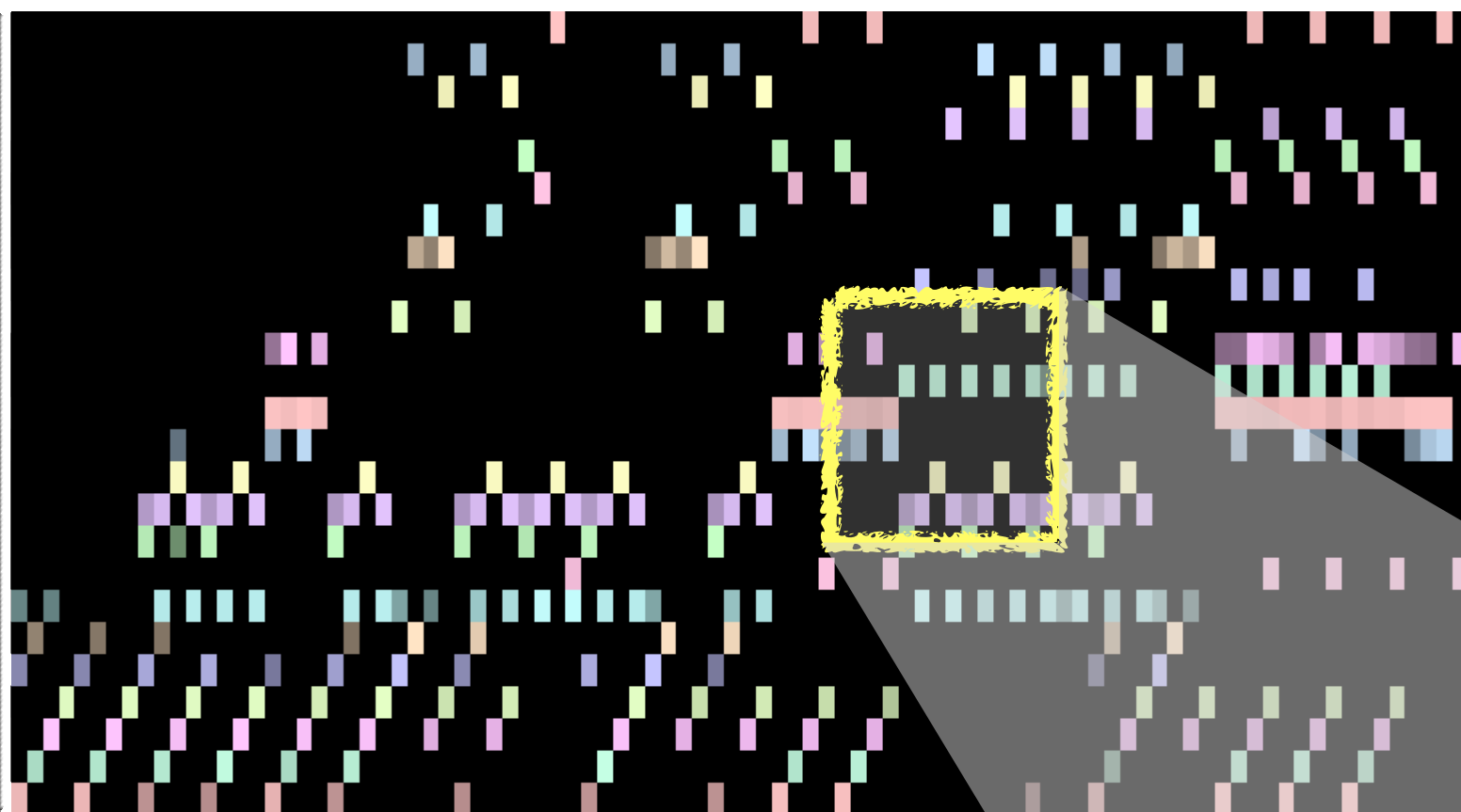
**Sound
templates**

frequency ↑

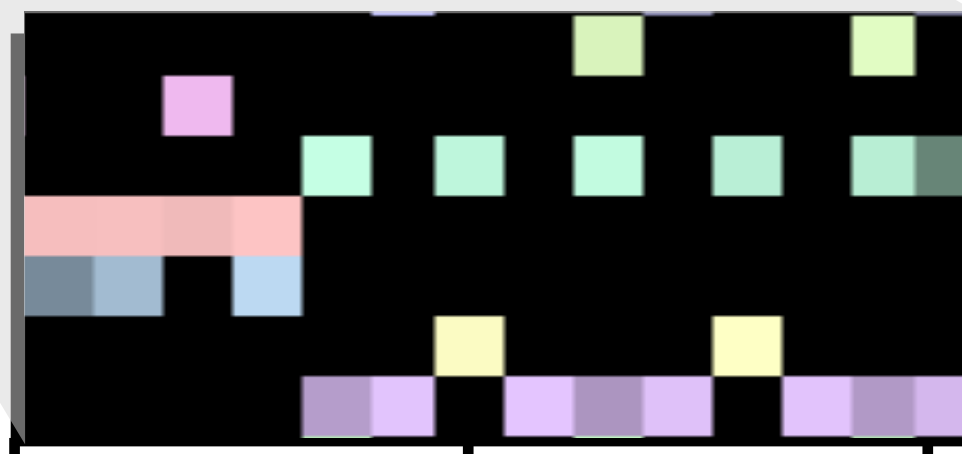




Loop templates



bar in piece →

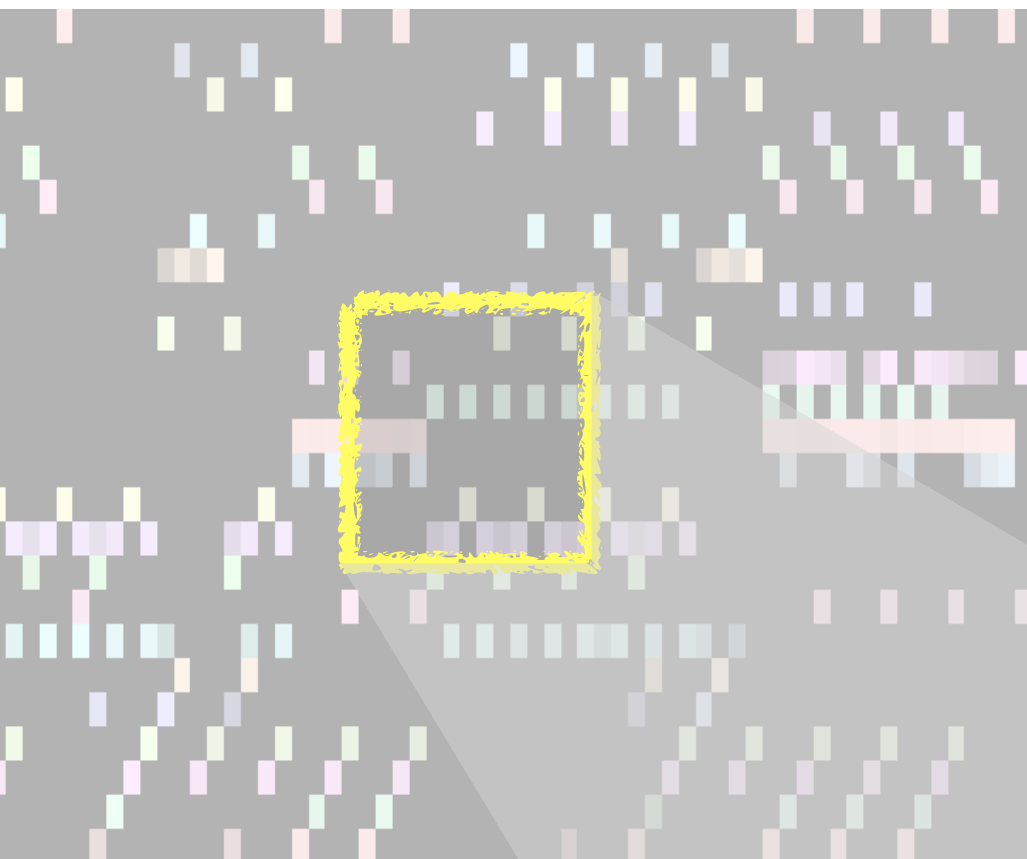


Bar 52

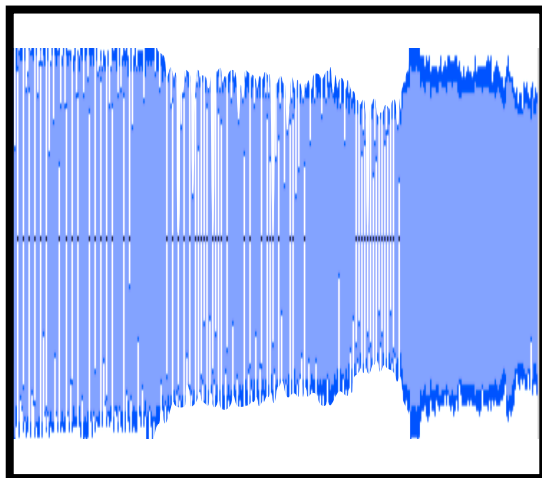
Bar 58

Bar 65

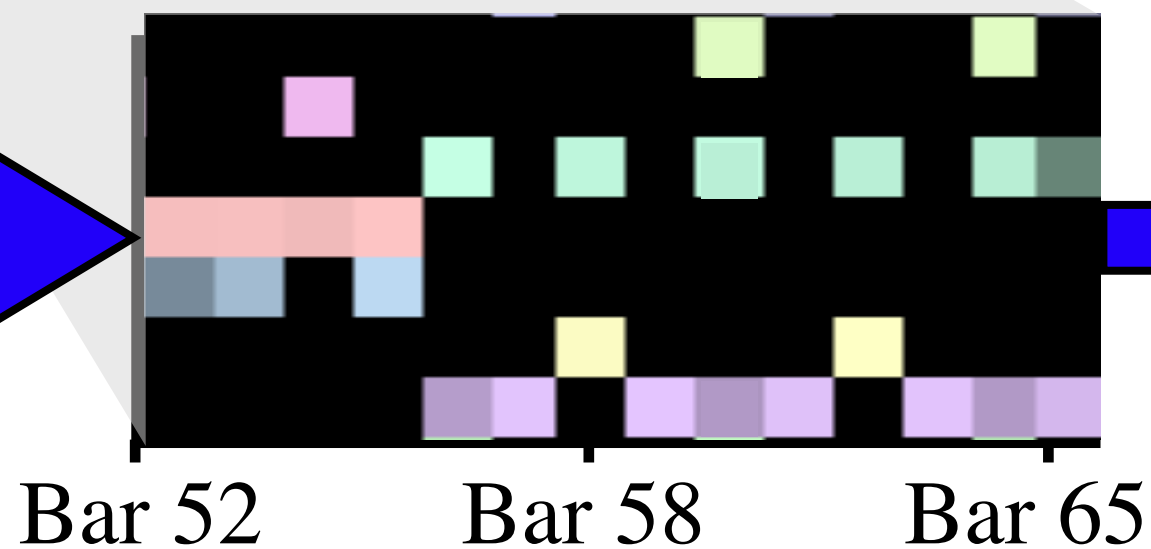
Song: "Doin' it Right" by Daft Punk



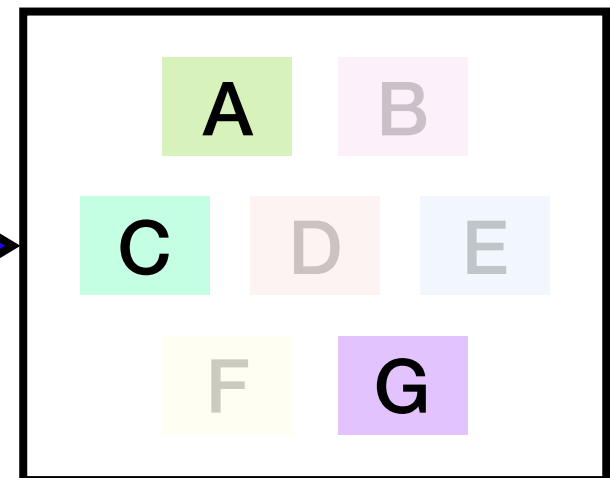
Bar #60



Bar #60



Ingredients
for bar #60:



<https://unmixer.ongaaccel.jp>

Thank you!

At our poster:

- learn how loops are selected;
- learn how “recipes” made more independent;
- use the interface!



This work was supported in part by JST ACCEL
Grant Number JPMJAC1602, Japan.

Unmixer



BPM: 112 ↕

Eurythmics - Sweet Dreams (125 bpm).mp3

[download](#)



t.A.T.u. - All The Things She Said (90bpm).mp3

[download](#)



Errorsmith - Superlative Fatigue (128 bpm).m4a

[download](#)



Unmix and isolate 5 ↕ loops

Try dropping an audio file here, or click to select
an audio file to upload.