

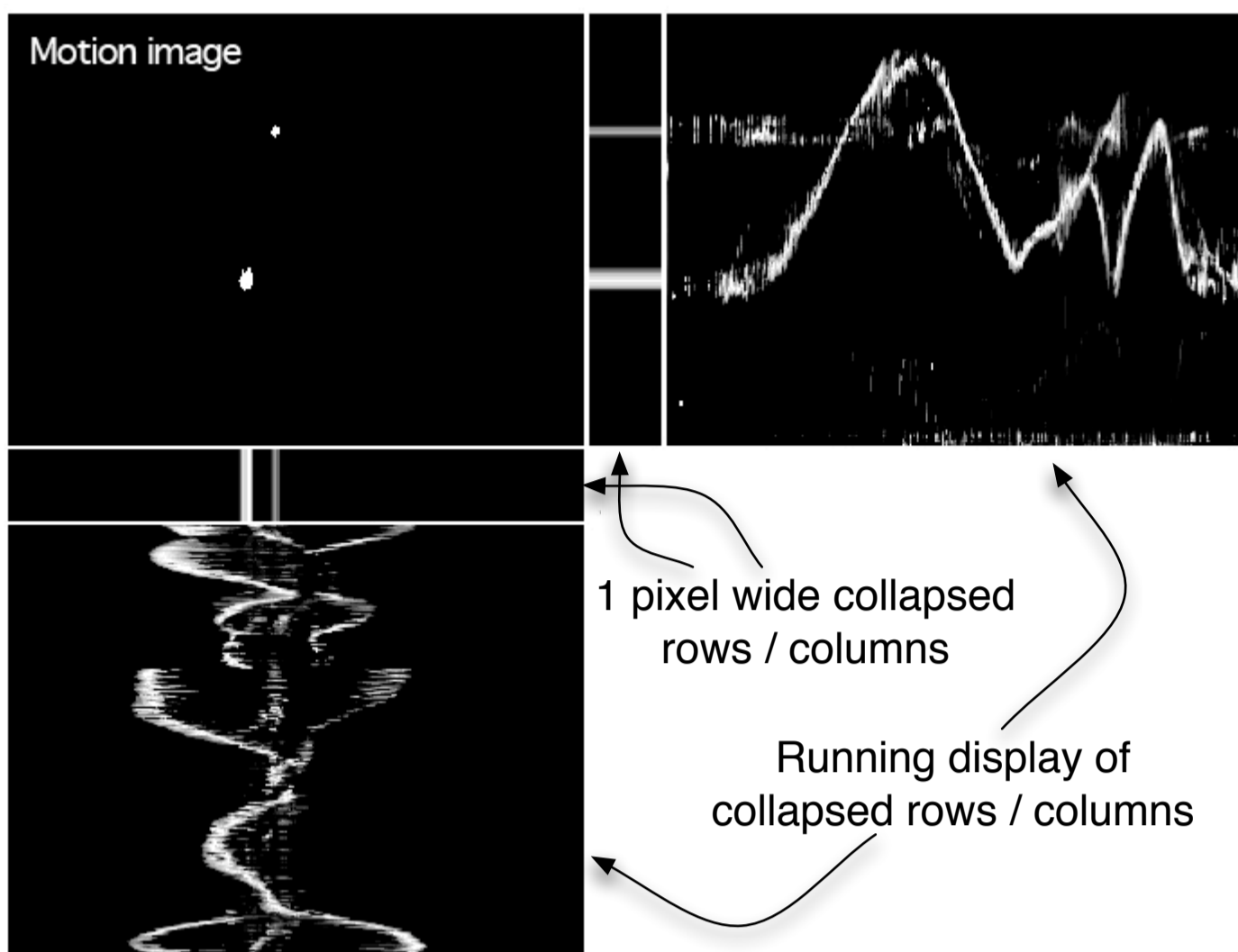
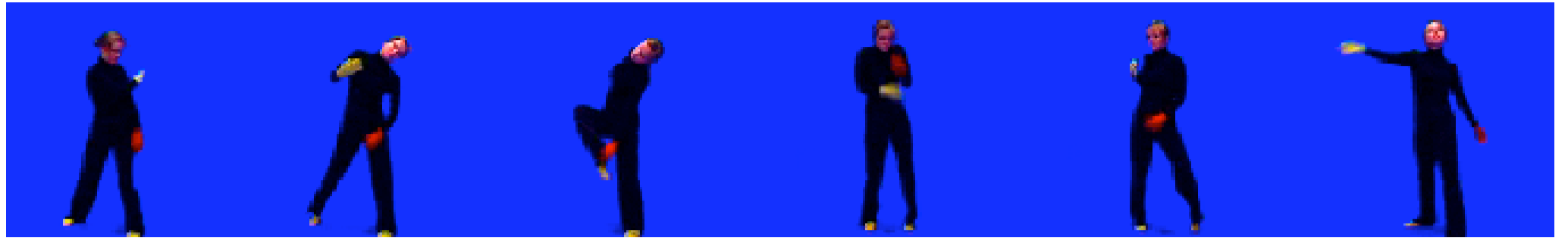
Using MOTIONGRAMS in the Study of Musical Gestures

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CHALLENGE

Keyframe displays are not particularly useful when studying single-shot studio recordings of music-related movements, since they mainly show static postural information and no motion.

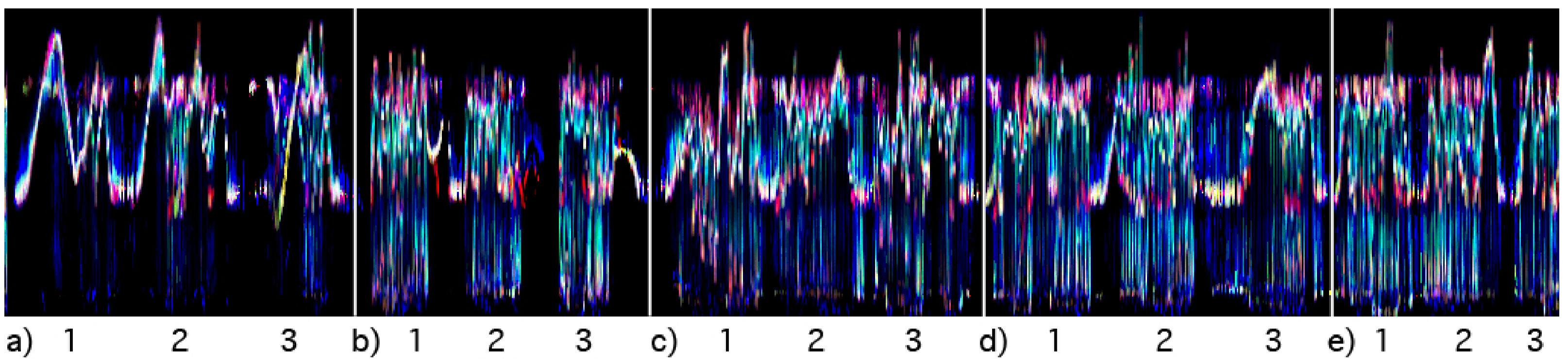
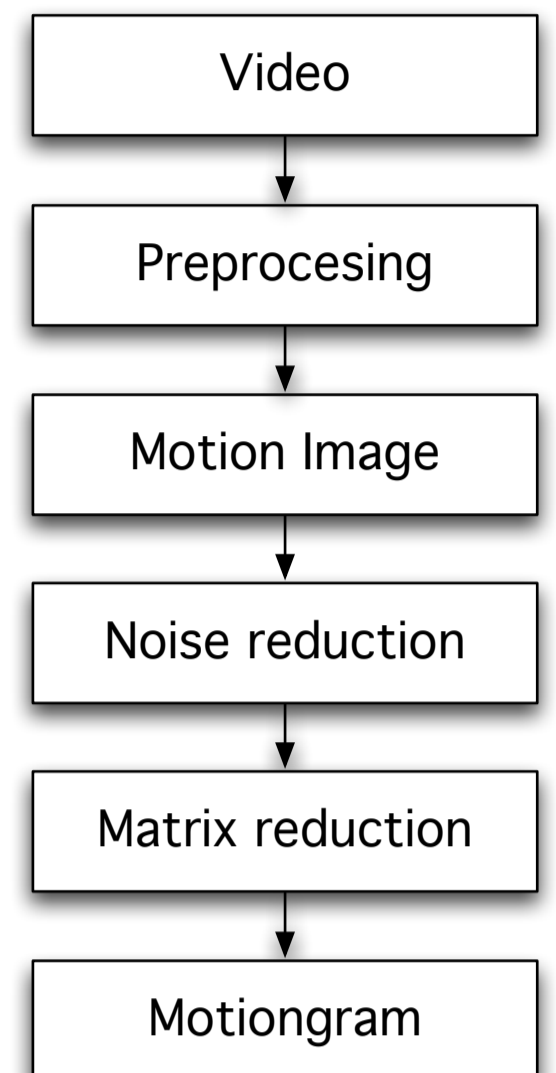


MOTIONGRAMS

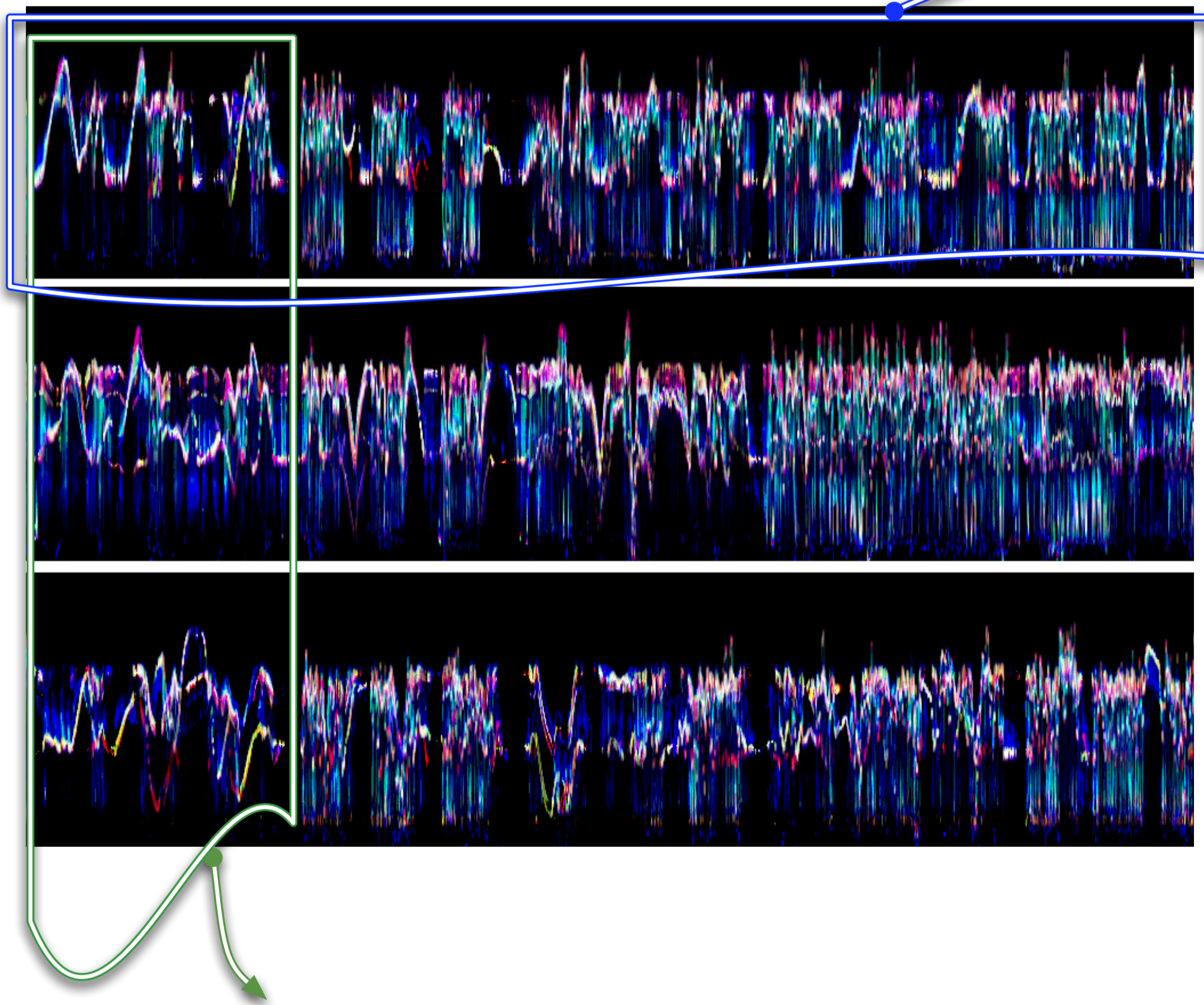
We are used to visualizing audio with spectrograms, and have been exploring different techniques for visualizing music-related movements in a similar manner.

Motiongrams are made by calculating the means of the rows and columns of the motion image (difference between consecutive frames) and plotting them over time.

No motion tracking or other computer vision techniques are applied. A motiongram is simply a reduction of the video stream and is thus a good starting point for further quantitative and qualitative analysis.



Motiongrams of a five minute video of free dance movements to music. The dancers moved to five different musical excerpts (a-e) and each excerpt was repeated three times (1-3).

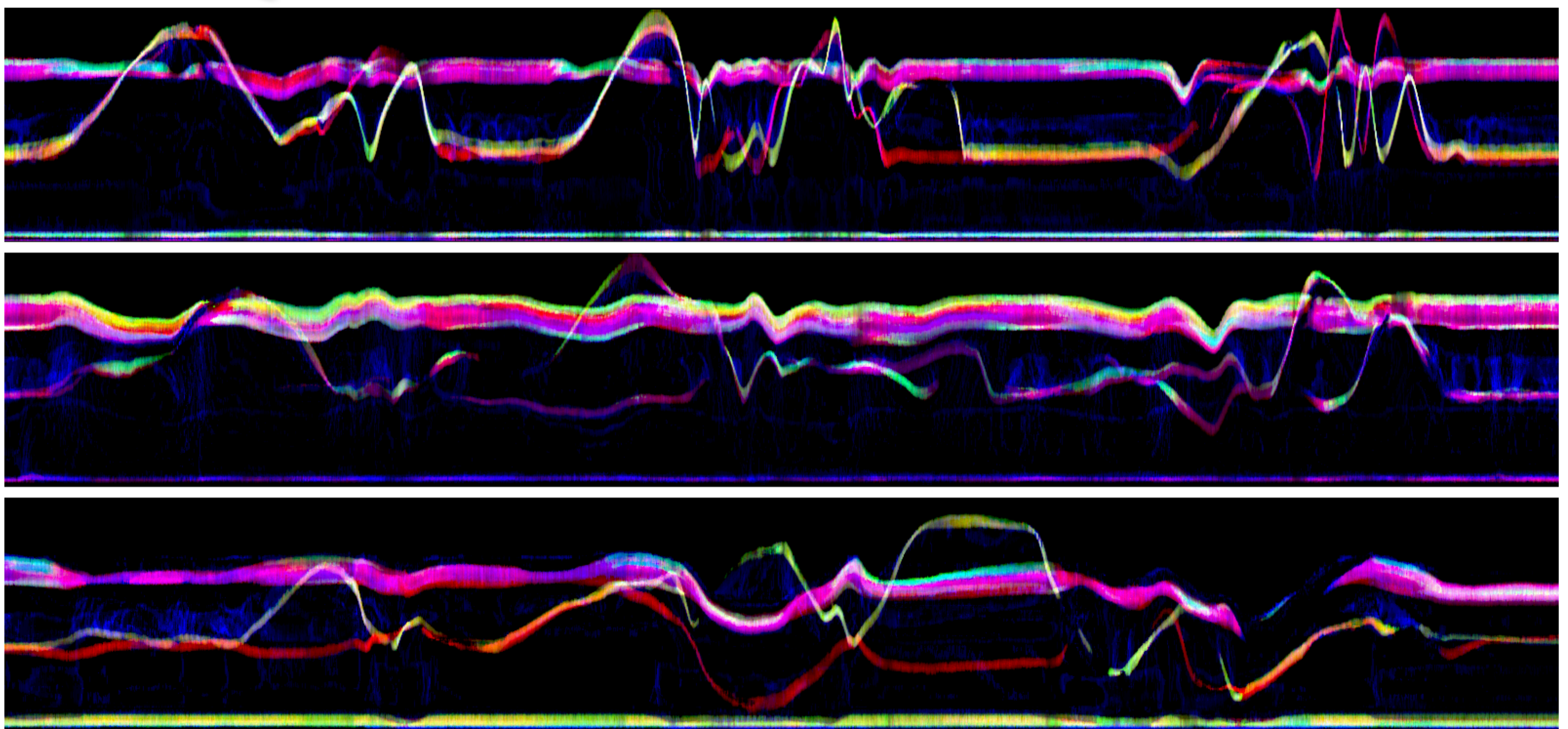


USING MOTIONGRAMS

Motiongrams allow for quick navigation in video material and for comparative analysis of motion qualities.

Although quite rough, it is easy to see differences in the quantity of motion and similarities in upward/downward patterns between motion sequences.

The images to the left and above show a five minute dance improvisation, and below is the first 40 seconds of the same sequence. Notice how it is possible to follow the trajectories of the hands (because of the yellow and red gloves) and head (pink due to saturation), as well as the body (appears blue due to the background).



FUTURE WORK

- 3D motiongrams showing both horizontal and vertical motion.
- Combined displays with audio, video and sensor information.
- Improve efficiency.

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