What we plan to do?

Thursday, October 29, 2020 7:40 PM

THEORY PART

We have read and partially understood the various mathematical techniques mentioned in the paper[1] for pre-processing, reduction and peak picking.

To understand the reduction techniques in more detail we plan to briefly read the following papers:

- Envelope follower : [2]
- High frequency content Function : [3]
- Spectral Difference : [4]
- Phase Deviation : [5]
- Negative log-likelihood : [6]
- Surprise signal : [7]

CODING PART

We will implement the various detection functions mentioned in the paper[1] in MATLAB for various music signals and provide a guideline for choosing the right detection function depending upon the type of music signal.

Our final result will be a graphical comparison of the performance of the different detection functions described in the paper[1]. For each method, we will display the relationship between the percentage of true positives (i.e., correct onset detections relative to the total number of existing onsets) and percentage of false positives (i.e., erroneous detections relative to the number of detected onsets).

REFEERENCES

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[3] P. Masri, “Computer Modeling of Sound for Transformation and Synthesis of Musical Signal,” Ph.D. dissertation, Univ. of Bristol, Bristol, U.K., 1996.

[4] C. Duxbury, M. Sandler, and M. Davies, “A hybrid approach to musical note onset detection,” in Proc. Digital Audio Effects Conf. (DAFX,’02), Hamburg, Germany, 2002, pp. 33–38.

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[6] M. Basseville and I. V. Nikiforov, Detection of Abrupt Changes—Theory and Application. Englewood Cliffs, NJ: Prentice-Hall, 1993.

[7] S. A. Abdallah and M. D. Plumbley, “Probability as metadata: event detection in music using ICA as a conditional density model,” in Proc. 4th Int. Symp. Independent Component Analysis and Signal Separation (ICA2003), Nara, Japan, 2003, pp. 233–238.