

Multiple Fundamental Frequency Estimation of Piano Signals by Sparse Representation of Magnitude Spectra

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ABSTRACT

Assuming that the waveforms of piano notes are pre-stored and that the magnitude spectrum of a piano signal segment can be represented as a linear combination of the magnitude spectra of the pre-stored piano waveforms, we formulate the automatic transcription of polyphonic piano music as a sparse representation problem. First, the note candidates of the piano signal segment are found by using heuristic rules. Then, the sparse representation problem is solved by l_1 -regularized minimization, followed by temporal smoothing the frame-level results based on hidden Markov models.

1. PROPOSED METHOD

This submission is an extension of our last year's submission [1]. The implementation details can be found in [2].

2. ACKNOWLEDGMENTS

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3. REFERENCES

- [1] C.-T. Lee, Y.-H. Yang, K.-S. Lin and H. H. Chen. (2010). Multiple fundamental frequency estimation of piano signals via sparse representation of Fourier Coefficients. Music Information Retrieval Evaluation eXchange. [Online]. Available: <http://www.music-ir.org/mirex/abstracts/2010/LYLC1.pdf>
- [2] C.-T. Lee, Y.-H. Yang, and H. H. Chen, "Automatic transcription of piano music by sparse representation of magnitude spectra," in *Proc. IEEE Int. Conf. Multimedia Expo.*, Barcelona, Spain, Jul. 2011.