

MIREX SUBMISSIONS FOR CHORD RECOGNITION AND KEY ESTIMATION 2017

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ABSTRACT

This abstract describes our chord recognition and key estimation submissions for MIREX 2018.

1. CHORD RECOGNITION

Our submission for the chord recognition task is the same as 2017 and follows closely the descriptions in [3]. It predicts major and minor chords (and the “no chord” class) only.

This program uses features learned automatically by a fully convolutional neural network as described in [3]. The architecture differs slightly from the one presented in the paper: instead of padding the feature maps in the first four convolutional layers, we increased the input size accordingly, such that the feature maps after the fourth layer have the same size as in [3]. The input spectrogram thus comprises a frequency range of 60 - 2600 Hz. The chord sequence is then decoded using a linear-chain Conditional Random Field (CRF). Finally, we align the chord segments to beats detected by the *DBNBeatTracker* algorithm provided in *madmom*, which is in turn based on [2] and [6].

1.1 Training

The neural networks and conditional random fields were trained on the following data sets: Beatles, Queen and Zweieck¹, Robbie Williams², RWC Popular³, and the public part of McGill Billboard⁴.

2. KEY CLASSIFICATION

The key estimation model is based on [5]. It is a VGG-style fully convolutional neural network with 9 convolutional layers. See the original paper for details of the architecture and training process. An implementation of this model is

¹ <http://isophonics.net/datasets>

² https://www.researchgate.net/publication/260399240_Chord_and_Harmony_annotations_of_the_first_five_albums_by_Robbie_Williams

³ <https://staff.aist.go.jp/m.goto/RWC-MDB/> and <https://github.com/tmc323/Chord-Annotations>

⁴ <http://ddmal.music.mcgill.ca/billboard>

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part of the *madmom* audio processing framework [1] available at <https://github.com/CPJKU/madmom>.

2.1 Training

The key estimation model was trained using 1077 pieces from the GiantSteps MTG Key dataset⁵, an in-house dataset of 1751 (mostly piano) classical music pieces, and the training subset of the McGill Billboard dataset with key annotations derived automatically following [4]. Note that the GiantSteps MTG Key dataset is *distinct* from the GiantSteps Key dataset that is used for evaluation at MIREX.

3. ACKNOWLEDGEMENTS

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4. REFERENCES

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⁵ <https://github.com/GiantSteps/giantsteps-mtg-key-dataset>

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