# Finding new practice material through chord-based exploration of a large music catalogue

**Johan Pauwels**
Queen Mary University of London
j.pauwels@qmul.ac.uk

**Mark B. Sandler**
Queen Mary University of London
mark.sandler@qmul.ac.uk

## ABSTRACT

Our demo is a web app that suggests new practice material to music learners based on automatic chord analysis. It is aimed at music practitioners of any skill set, playing any instrument, as long as they know how to play along with a chord sheet. Users need to select a number of chords in the app, and are then presented with a list of music pieces containing those chords. Each of those pieces can be played back while its chord transcription is displayed in sync to the music. This enables a variety of practice scenarios, ranging from following the chords in a piece to using the suggested music as a backing track to practice soloing over.

## 1. CONCEPT

On a research level, we are exploring a new way of navigating large collections of music. This is especially relevant because one of the audio catalogues it is built on is Jamendo, a Creative Commons music platform. This means that all their music is freely available for personal use, but typically suffers from low exposure. 100K of the tracks that Jamendo actively promotes for commercial usage such as in-store radios (implying a minimum of recording standards) form one catalogue of our system. The other catalogue consists of 442K tracks of commercial audio from Deezer's collection.

Our system can be seen as a novel type of music recommendation, as the latter is traditionally based on lower-level features or collaborative filtering [1]. Meanwhile, other applications of chord recognition are song-centric, meaning that you first decide which song you want to learn and then retrieve its chords, without chord-based recommendation [2].

Furthermore, our web app is also an experiment in assessing the usability of automatic chord transcription. Since the music on Jamendo is unknown, pre-existing transcriptions crowdsourced from the internet are not available, and since the collection is large, the human effort to transcribe all tracks specifically for this purpose is prohibitive. Instead an automatic chord transcription algorithm is used. However, even state-of-the-art chord transcription systems do not always produce results that are of sufficient quality



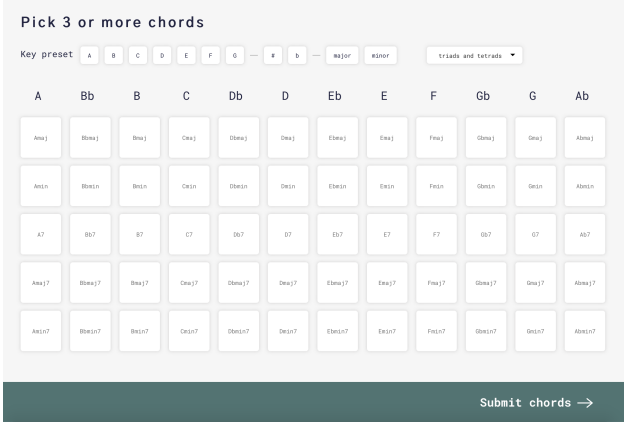


Figure 1. The query screen where a chord combination can be selected.

for musicians to use as a guide to play along with the music. The underlying transcription algorithm [3] therefore produces a measure of confidence in addition to its chord output. This confidence is then used by the query resolution algorithm to suggest appropriate music to the users, together with the selection of chords they specified. As there is no human ground-truth available to compare the algorithmic output with, users are simply asked if they find the chord transcriptions of sufficient quality to be useful in their practice sessions. The automatic chord recognition is used for the commercially available audio too because crowdsourced chord annotations might be available, but not necessarily in a machine-readable form, of consistent quality and aligned to the audio.

## 2. INTERFACE

From a user's perspective, the interface consists of three screens. The first is the *query screen*, shown in Figure 1, where the user makes a selection of chords. This can be a free selection, or one of the presets that select all diatonic chords in a certain key can be used. Submitting the chord selection to the system takes you to a *list of results*, displayed in Figure 2. Here the music pieces that contain the requested chords are presented. Clicking on each of these results leads to a *music player*, as in Figure 3, where the music is played back with the chords displayed in sync. The current version of the interface was developed based on the user feedback and user observations we got from an earlier prototype [4].


Figure 2. The list of results for a particular chord query.

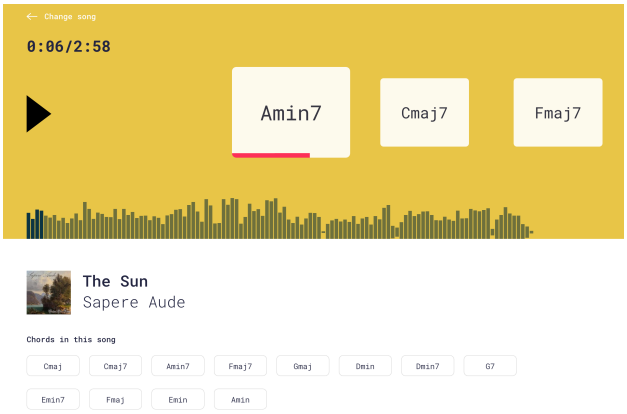


Figure 3. The music player displaying the chords in sync with the music.


## Acknowledgments

This work has been partly funded by the UK Engineering and Physical Sciences Research Council (EPSRC) grant EP/L019981/1 and by the European Union's Horizon 2020 research and innovation programme under grant agreement N° 688382.


## 3. REFERENCES


[1] O. Celma, *Music Recommendation and Discovery: The Long Tail, Long Fail, and Long Play in the Digital Music Space*. Springer-Verlag Berlin Heidelberg, 2010.

[2] W. B. de Haas, J. P. Magalhães, D. ten Heggeler, G. Bekenkamp, and T. Ruizendaal, "Chordify: Chord Transcription for the Masses," in *Proceedings of the 13th ISMIR Conference, Late Breaking and Demo Session*, 2014.

[3] J. Pauwels, K. O'Hanlon, G. Fazekas, and M. B. Sandler, "Confidence Measures and Their Applications in Music Labelling Systems Based on Hidden Markov Models," in *Proceedings of the 18th ISMIR Conference*, 2017, pp. 279–285.

[4] J. Pauwels, A. Xamb, G. Roma, M. Barthet, and G. Fazekas, "Exploring real-time visualisations to support chord learning with a large music collection," in *Proceedings of the 4th Web Audio Conference*, 2018.