

Abstract

Author:	Bc. Ladislav Maršík
Title:	Music Harmony Analysis
Subtitle:	Towards a Harmonic Complexity of Musical Pieces
University:	Comenius University in Bratislava
Faculty:	Faculty of mathematics, physics and informatics
Department:	Department of computer science
Supervisor:	Mgr. Martin Ilčík ICGA TU Wien
Date and place of publication:	June 2013, Bratislava

In this work we present a new theoretical model for finding out the complexity of harmonic movements in a musical piece. We first define, what the yet undefined term, harmonic complexity, means for us, finding different perspectives. Our basic model is based on tonal harmony. Utilizing the fundamental rules used in western music we define a grammar based model in which transition complexity between two harmonies can be evaluated as the computational time complexities of derivation from one harmony to the other. In graph representation the transition complexity can be found as the shortest path between the two harmonies. For these purposes we have created an object oriented model that implements the theoretical model. In the end we deploy the system, Harmanal, capable of analyzing harmony transitions from MIDI and WAV input. We have used Harmanal for comparing the overall harmony complexities of musical pieces from different genres. Moreover, we find Harmanal as a new possibility for enhancing music information retrieval tasks such as implementing a recommender system for music.

Keywords: harmonic complexity, music complexity, harmony analysis, chord transcription, chord progression, music information retrieval, recommender system