T1: Jazz solo analysis between music information retrieval, music psychology, and jazz research

The tutorial will consist of four parts. The first part sets the scene with a short run through jazz history and its main styles and an overview of the central musical elements in jazz. Out of this introduction, the main research questions will be derived, which cover jazz research and jazz historiography, analysis of musical style, performance research, and psychology of creative processes. Particularly, research issues as addressed in the Jazzomat Research Project will be discussed and results will be presented.

The second part of the tutorial will deal with the details of the Weimar Jazz Database. Each solo encompasses pitch, onset, and offset time of the played tones as well as several additional annotations, e.g., manually tapped beat grids, chords, enumerations of sections and choruses as well as phrase segmentations. The process of creating the monophonic transcriptions will be explained (solo selection, transcription procedure, and quality management) and examples will be shown. Moreover, the underlying data-model of the Weimar Jazz Database, which includes symbolic data as well as data automatically extracted from the audio-files (e.g., intensity curves and beat-wise bass chroma) will be discussed in detail.

In the third part, we will introduce our analysis tools MeloSpySuite and MeloSpyGUI, which allow the computation of a large set of currently over 500 symbolic features from monophonic melodies. These features quantify various tonal, harmonic, rhythmic, metrical, and structural properties of the solo melodies. In addition, pattern retrieval modules, based on n-gram representations and a two-stage search option using regular expressions, play an integral part for the extraction of motivic cells and formulas from jazz solos. All tools can be readily applied to other melodic datasets besides the Weimar Jazz Database. Several use cases will be demonstrated and research results will be discussed.

The final part of the tutorial will focus on audio-based analysis of recorded jazz solo performances. We follow a score-informed analysis approach by using the solo transcriptions from the Weimar Jazz Database as prior information. This allows us to mitigate common problems in transcribing and analyzing polyphonic and multi-timbral audio such as overlapping instrument partials. A score-informed source separation algorithm is used to split the original recordings into a solo and an accompaniment track, which allows the tracking of f0-curves and intensity contours of the solo instrument. We will present the results of different analyses of the stylistic idiosyncrasies across well-known saxophone and trumpet players. Finally, we will briefly outline further potentials and challenges of score-informed MIR techniques.

Jakob Abeßer holds a degree in computer engineering (Dipl.-Ing.) from Ilmenau University of Technology. He is a postdoctoral researcher in the Semantic Music Technologies group at Fraunhofer IDMT and obtained a PhD degree (Dr.-Ing.) in Media Technology from Ilmenau University of Technology in 2014. During his PhD, he was a visiting researcher at the Finnish Centre of Excellence in Interdisciplinary Music Research, University of Jyväskylä, Finland in 2010. As a research scientist at Fraunhofer, he has experience with algorithm development in the fields of automatic music transcription, symbolic music analysis, machine learning, and music instrument recognition. Also, he works as a postdoctoral researcher at the University of Music in Weimar in the Jazzomat Research Project, focusing on analyzing jazz solo recordings using

Music Information Retrieval technologies.

Klaus Frieler graduated in theoretical physics (diploma) and received a PhD in systematic musicology in 2008. In between, he worked several years as a freelance software developer before taking up a post as lecturer in systematic musicology at the University of Hamburg in 2008. In 2012, he had a short stint at the C4DM, Queen Mary University of London. Since the end of 2012, he is a post-doctoral researcher with the Jazzomat Research Project at the University of Music “Franz Liszt” Weimar. His main research interests are computational and statistical music psychology with a focus on creativity, melody perception, singing intonation, and jazz research. Since 2006, he also works as an independent music expert specializing in copyright cases.

Wolf-Georg Zaddach studied musicology, arts administration, and history in Weimar and Jena, music management and jazz guitar in Prague, Czech Republic. After finishing his Magister Artium with a thesis about jazz in Czechoslovakia in the 50s and 60s, he worked as assistant professor at the department of musicology in Weimar. Since 10/2012 he works at the jazz research project of Prof. Dr. Martin Pfleiderer. Since 02/2014, he holds a scholarship by the German National Academic Foundation (Studienstiftung des deutschen Volkes) for his Ph.D. about heavy and extreme metal in the 1980s GDR/East Germany. He frequently performs live and on records as a guitarist.