THE JAZZOMAT RESEARCH PROJECT - JAZZ SOLO ANALYSIS USING MUSIC INFORMATION RETRIEVAL METHODS

Jakob Abeßer[1,2] **Klaus Frieler**[1] **Martin Pfleiderer**[1]
[1] University of Music Franz Liszt, Weimar, Germany
[2] Fraunhofer IDMT, Ilmenau, Germany
jakob.abesser@idmt.fraunhofer.de

ABSTRACT

In this paper, we introduce the Jazzomat Research Project and present two contributions to the Music Information Retrieval (MIR) community. First, the Weimar Jazz Database currently includes 299 high-quality jazz solo transcriptions and covers a wide range of jazz styles and artists. Second, MeloSpySuite provides methods for symbolic feature extraction, pattern retrieval, and visualization of monophonic melodies.

1. INTRODUCTION

The Jazzomat Research Project focusses on the statistical analysis of monophonic jazz solos in order to explore the cognitive and cultural foundations of jazz solo improvisation. The project combines research approaches from jazz research, cognitive music psychology, computational (ethno-)musicology as well as music information retrieval (MIR) in an interdisciplinary fashion. In addition to the main focus on symbolic music analysis, we developed methods for score-informed analysis of recorded jazz solos to further investigate non-syntactical properties such as intonation, pitch modulation, dynamics, and timbre.

2. WEIMAR JAZZ DATABASE

The **Weimar Jazz Database** (WJazzD) is a novel dataset of high-quality jazz solo transcriptions covering the most important jazz epochs and performers of the 20th century. Using the Sonic Visualiser [1] software, each solo was transcribed and cross-checked manually by musicology and jazz students at the University of Music Weimar. For each solo, extensive metadata annotation is provided such as musical style, genre, rhythm feel, tonality type, instrumentation, musical key, and tempo class. In addition to the transcription, several annotation layers are included such as beat positions, chord changes, segmentation into musical phrases, choruses and form parts, as well as note annotations w.r.t. articulation and pitch modulation. Due to copyright restrictions, we cannot publish the corresponding audio recordings. However, the **WJazzD** includes the MusicBrainz ID as well as the solo start and end time within the original recording.

3. MELOSPYSUITE

The **MeloSpySuite** software provides both a graphical user interface and commandline tools for a computer-aided analysis of monophonic melodies. It contains three major components: **melfeature**, **melpat**, and **melconv**. The **melfeature** component is a modular system, which allows the user to define feature extractors based on the combination of subsequent or parallel processing steps. Currently, over 500 different feature extractors are provided that cover various properties related to rhythm (e.g., duration classes, inter-onset-intervals, micro-timing, event density, accents), melody (e.g., interval, fuzzy interval, chordal (diatonic) pitch classes), structure (e.g., phrase self-similarity, run-lengths), and tone-formation (e.g., articulation, modulation, loudness). The **melpat** component allows to retrieve patterns in monophonic melodies. The user is provided with various search options to define for instance the minimum and maximum pattern length and number of occurrences, or to filter out trills, arpeggios, or scale runs. Finally, **melconv** allows to convert between different symbolic music representations (Sonic Visualiser SV format, MCSV, sqlite, EsAC, **kern, Tony CSV files)

4. ACKNOWLEDGEMENTS

The Jazzomat research project is supported by a grant of the German Research Foundation ("Melodisch-rhythmische Gestaltung von Jazzimprovisationen. Rechnerbasierte Musikanalyse einstimmiger Jazzsoli", DFG-PF 669/7-1). The authors would like to thank all jazz and musicology students participating in the transcription and annotation process.

5. REFERENCES

[1] C. Cannam, C. Landone, and M. Sandler "Sonic Visualiser: An Open Source Application for Viewing, Analysing, and Annotating Music Audio Files," *Proceedings of the ACM Multimedia 2010 International Conference*, Firenze, Italy, pp. 1467–1468, 2010.