Tutorial 1

An Introduction to Symbolic Music Processing in Python with Partitura

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Abstract

Symbolic music formats (e.g., MIDI, MusicXML/MEI) can provide a variety of high-level musical information like note pitch and duration, key/time signature, beat/downbeat position, etc. Such data can be used as both input/training data and as ground truth for MIR systems.

This tutorial aims to provide an introduction to symbolic music processing for a broad MIR audience, with a particular focus on showing how to extract relevant MIR features from symbolic musical formats in a fast, intuitive, and scalable way. We do this with the aid of the Python package Partitura. To target different kinds of symbolic data, we use an extended version of the ASAP Dataset, a multi-modal dataset that contains MusicXML scores, MIDI performances, audio performances, and score-to-performance alignments.

The tutorial will be structured in four parts: The first part provides an introduction to the topic of symbolic music processing. The second, third, and fourth parts are hands-on tutorials that showcase the structure of the Partitura package (including its relation to other popular Python packages for symbolic music processing), how to extract common MIR features, and how to work with symbolic multimodal datasets, respectively.

The motivation behind this tutorial is to promote research on symbolic music processing in the MIR community. Therefore, we target a broad audience of researchers without requiring prior knowledge of this particular area. For the hands-on parts of the tutorial, we presuppose some practical experience with the Python language, but we will provide well-documented step-by-step access to the code in the form of Google Colab notebooks, which will be made publicly available after the tutorial. Furthermore, some familiarity with the basic concepts of statistics and machine learning is useful.

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Biographies of Presenters

Carlos Cancino-Chacón is an Assistant Professor at the Institute of Computational Perception, Johannes Kepler University, Linz, Austria, and a Guest Researcher at the RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion, University of Oslo, Norway. His research focuses on studying expressive music performance, music cognition, and music theory with machine learning methods. He received a doctoral degree in Computer Science at the Institute of Computational Perception of the Johannes Kepler University Linz, a M.Sc. degree in Electrical Engineering and Audio Engineering from the Graz University of Technology, a degree in Physics from the National Autonomous University of Mexico, and a degree in Piano Performance from the National Conservatory of Music of Mexico.

Francesco Foscarin is a postdoctoral researcher at the Institute of Computational Perception, Johannes Kepler University, Linz, Austria. He completed his Ph.D. at CNAM Paris on music transcription, with a focus on the production of musical scores, and holds classical and jazz piano degrees from the Conservatory of Vicenza. His research interests include post-hoc explainability techniques for DL models, grammar-based parsing of hierarchical chord structures, piano comping generation for jazz music, and voice separation in symbolic music.

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