Encoding Musical Performances

Axel Berndt

Center of Music and Film Informatics, OWL University of Applied Sciences and Arts

Germany

axel.berndt@th-owl.de

Abstract

The musical performance of a score is a domain rarely addressed in a reasonable level of detail by current digital music editions. A main reason for this may be a lack of suitable data formats that are capable of encoding more than ambiguous performance symbols or rather technical measurement series. The Music Performance Markup format is a recent development that fills this gap. This workshop gives a practical introduction to the format. The core software tool to create performance encodings is MPM Toolbox. Participants familiarise themselves with it during the course of the workshop, have the opportunity to experiment and create their own performance encodings, and give feedback that will motivate future development.

Introduction

The majority of digital music editions are dedicated to the printed musical text. Once an MEI or MusicXML encoding is produced it is rather easy with currently available software tools to also generate corresponding MIDI data and listen to it. At this stage, it becomes strikingly obvious that a musical performance involves more than the precise reproduction of notes and printed performance signs. Musicology devotes an entire branch to this subject, i.e., performance research, which becomes increasingly relevant with the predominant role of audio documents in the musical culture of the past century. With the increased research interest in this subject, especially in the fields of musicology and music information retrieval, comes the need for high-quality research data, whether in the form of measurement datasets or critical editions.

Measurement datasets, e.g., by Brinkmann & von Loesch (2018), provide highly detailed insights into technical features such as note onset timings and amplitude envelopes that were obtained from audio analyses or MIDI recordings. An analysis tool commonly used for this task is the Sonic Visualiser (Cannam et al., 2006). However, a considerable drawback of measurement series is their lack of abstraction and association with musically meaningful performance concepts. To what extent do systematic tempo shaping, rubati, asynchronies, and agogic offsets contribute to an apparently noisy timing curve? How do dynamics, metrical accentuation and articulation interact with respect to the measured loudness of a tone? Yet such high-level concepts and their visual representation in the form of performance instructions in the score are largely subject to inconsistent interpretation. How loud is forte? How fast is allegro? How short is staccato? Such high-level concepts alone are hardly suited to support objective scientific discourse.

The Music Performance Markup (MPM) format [(Berndt, 2021)](#) constitutes a performance encoding tool that disambiguates high-level performance concepts by mathematical models for each performance feature and, thus, can be utilized to approximate and match measurement data with musically meaningful abstractions. Moreover, MPM can be used to annotate performance scores, i.e., (re-)construct expressive performances from printed and handwritten markings, akin to a semantic annotation. It can also be used to apply the instructions found in historical performance treatises to a musical piece, thereby exploring and tracing historical change processes of performance practice and traditions.

1 Workshop Description

This workshop started with introducing the design concepts of MPM, then giving an overview of the performance features currently supported. These range from several timing and dynamics features to its versatile articulation and randomization models. This was followed by an overview of the available encoding and editing tools of which MPM Toolbox constituted the main application used in the further, more practical part of the workshop.

MPM is an XML format and can, thus, be integrated in any XML editing toolchain. MPM Toolbox is a graphical editor and analysis software that simplifies and accelerates work with MPM data significantly, see [Figure 1](#). It suggests a purposeful workflow that can also act as a starting point to conceive respective edition projects. Therefore, the workshop placed an emphasis on participants becoming familiar with this tool. Respective agenda items were:

- Running MPM Toolbox on local machines,
- Creating a new performance encoding project from symbolic music data (MEI, MIDI) and getting an overview of the project files,
- Introduction of the software components, GUI widgets and their handling,
- Workflow for creating and editing a performance description,
- Time for individual user experiences and questions. Participants experimented with MPM Toolbox's capabilities while creating their own performances. They did this with demo music encodings provided by the workshop tutor or with their own music encodings.

Throughout the workshop participants gave feedback which motivates further development activities of MPM and its software tools.
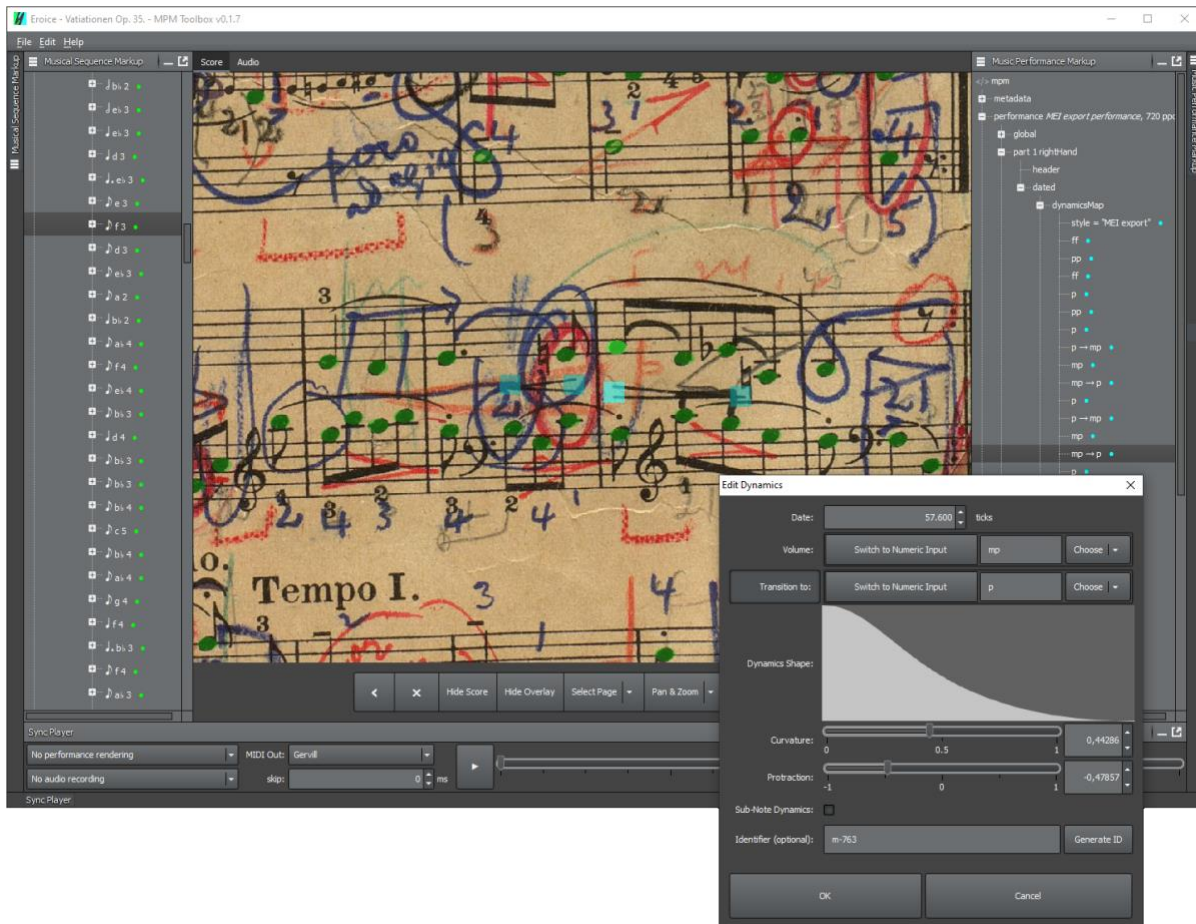
Figure 1: A screenshot of the MPM Toolbox application that was used throughout the workshop.

Acknowledgements

References

Berndt, A. (2021). Music Performance Markup: Format and Software Tools Report. *Music Encoding Conference*, Alicante, Spain, 2021.

Brinkmann, F. & von Loesch, H. (2018). Tempo data from 50 performances of Beethoven's Appassionata (Op. 57). http://dx.doi.org/10.14279/depositonce-7002

Cannam, C., Landone, C., Sandler, M. B. & Bello, J. P. (2006). The Sonic Visualiser: A Visualisation Platform for Semantic Descriptors from Musical Signals. *Proceedings of the 7th International Society for Music Information Retrieval Conference,* 234–237.