Implementing the “Enhancing Music Addressability” API for MusicXML

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INTRODUCTION

The ability to “address” areas of a musical score is useful in music scholarship such as analysis and/or historical research.

In this project, we implement software that enables us to “select” regions of MusicXML files, in accordance with the Enhancing Music Addressability (EMA) specification.

Project Link: http://umd-mith.github.io/ema/

MusicXML Implementation: https://github.com/imkevinkuo/ema2

EMA API

http://.../score.xml/**2,3/1+2,3+4/@all**

Extracted score portion

ENHANCING MUSIC NOTATION ADDRESSABILITY

There are many different formats to computationally represent music notation, such as MEI, MusicXML, etc.

To address this limitation, the EMA standard provides a system for selecting music notation based on commonly understood primitives: measures, staves, and beats.

Implementations of EMA can run on a user’s local machine or on a remote server as a web service.

PARSING EMA EXPRESSIONS

An “EMA expression” is a text sequence of the format:

`"{measureRanges}/{stavesToMeasures}/{beatsToMeasures}"`

`measureRanges`: Comma separated ranges of measures.

`stavesToMeasures`: Staff ranges separated by + signs and mapped to measure ranges with commas.

`beatsToMeasures`: Beat ranges marked by @ signs. Mapped to staff ranges by +, and mapped to measure ranges with commas.

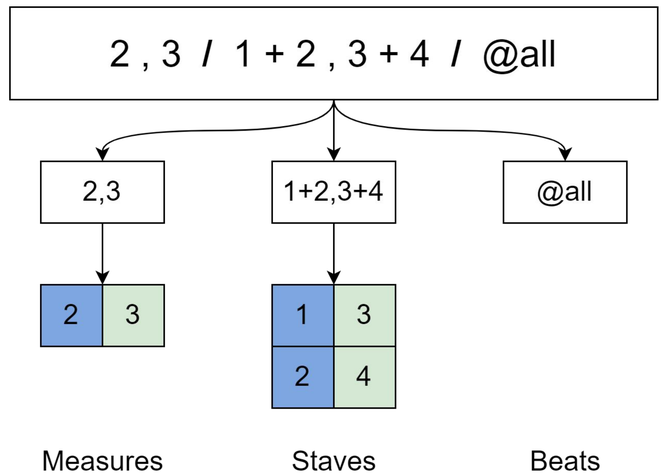

Figure 1. An EMA expression divided into musical components.

XML SLICING

MusicXML is based on **XML**, a tree-based markup language.

Given an EMA expression, we can traverse a music score (represented in XML) and check whether a measure/stave/beat should be selected.

```
<measure number="2">
  <note>
    <pitch>
      <step>E</step>
      <octave>4</octave>
    </pitch>
    <duration>60480</duration>
    <type>whole</type>
    <lyric>
      <syllabic>end</syllabic>
      <text>-tez</text>
    </lyric>
  </note>
  <note>
    ...
  </note>
</measure>
```

ACKNOWLEDGEMENTS

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EXAMPLE SELECTION

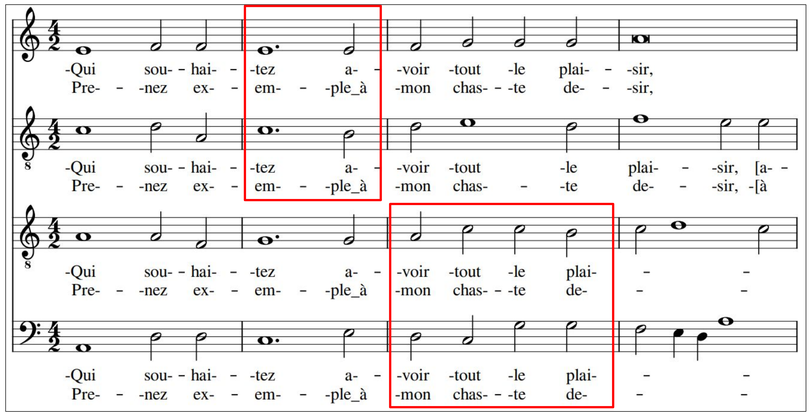

Figure 2. A sample score. The regions we want to extract are boxed in red.

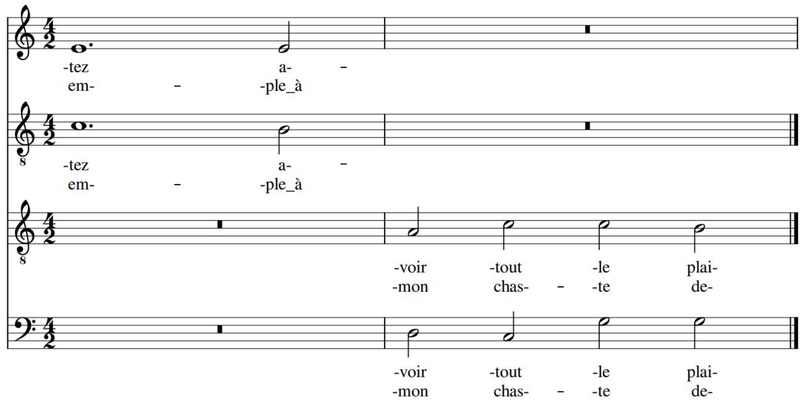

Figure 3. The score output from our software after selection is complete.