

# Implementing the Enhancing Music Addressability API for MusicXML

Kevin Kuo, Raffaele Viglianti

Implementing the "Enhancing Music Addressability" API for MusicXML  
 Kevin Kuo, Raffaele Viglianti - MEC 2020

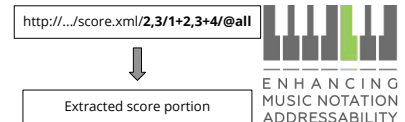


**INTRODUCTION**

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.

EMA Homepage: <http://music-addressability.github.io/ema/>  
 EMA for MusicXML: <https://github.com/music-addressability/ema-for-musicxml>

**EMA API**



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.

**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>
  ...
</measure>
    
```

**ACKNOWLEDGEMENTS**

MITH  
 Maryland Institute for Technology in the Humanities

Purdom Lindblad  
 Assistant Director of Innovation and Learning, MITH

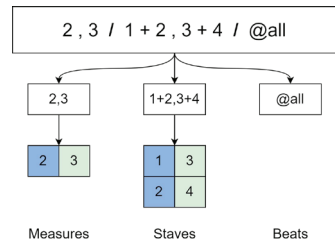


Figure 1. An EMA expression divided into musical components.

**EXAMPLE SELECTION**

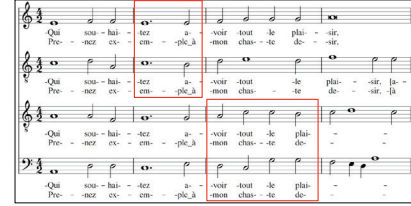


Figure 2. A sample score. The regions we want to extract are boxed in red.



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

## 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.

EMA Homepage: <http://music-addressability.github.io/ema/>

EMA for MusicXML: <https://github.com/music-addressability/ema-for-musicxml>

## 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.

## 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

MITH

Maryland Institute for Technology in the Humanities

Purdum Lindblad

Assistant Director of Innovation and Learning, MITH

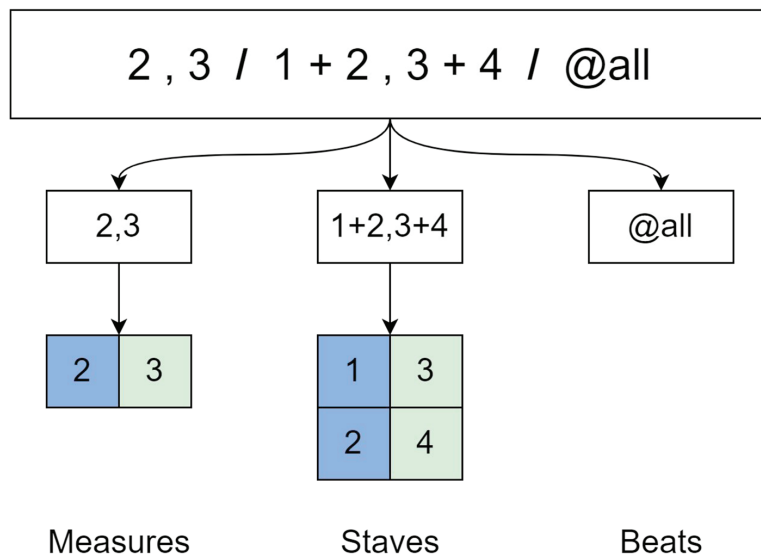


Figure 1. An EMA expression divided into musical components.

## 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.