

VINCENT BESSON
(CNRS – CESR – ricercar-lab)

KÉVIN ROGER
(Bibliissima – MUSICA2 Huma-Num)

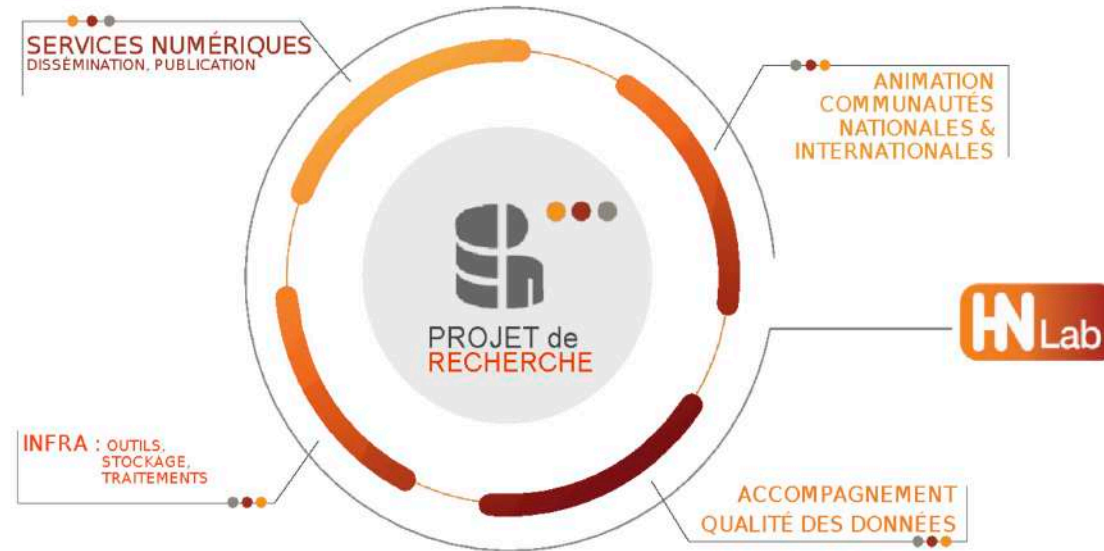
INTRODUCTION À LA MEI

(MUSIC ENCODING INITIATIVE)

2



Huma-Num au service des communautés



Développement de l'accompagnement et de l'animation des communautés :

- *Pôle accompagnement*
- *HN Lab*
- *Consortiums*
- *Mission MSH*
- *Mission Européenne*

LE CONSORTIUM MUSICA2

- Le consortium Huma-Num MUSICA2 est dédié à la musicologie numérique. Il se compose de plus d'une vingtaine de partenaires en France et à l'international.
- Face à la multiplication de ces ressources, l'objectif du consortium est de dégager des invariants dans les gestes et les opérations intellectuelles à la base des pratiques portant sur les sources au travers desquelles se donnent la musique et ses différents contextes (historique, théorique, social, esthétique, philosophiques, etc.). Cette direction s'inscrit plus largement dans la lignée des FAIR data qui sont aujourd'hui la norme en matière de partage des données.
- Le consortium recouvre trois axes de recherche : les formats numériques, les bases de données et le Web sémantique.



LES OBJECTIFS DE MUSICA2 POUR LA MEI

- Valorisation de la MEI auprès de la communauté musicologique
- Simplification et création de contenus didactiques
- Organisation de journées d'initiation destinées aux chercheurs, enseignants et étudiants
- Organisation de journées d'étude autour des projets numériques basés sur la MEI
- Pérennisation du format MEI

MUSIC ENCODING INITIATIVE

- Un terme générique qui décrit à la fois :
 - Une communauté de recherche sensibilisé à l'*open-source*
 - Un langage de balisage qui définit un système d'encodage de documents musicaux
 - Une organisation avec un bureau (MEI Board), une équipe technique, des utilisateurs

UNE COMMUNAUTÉ

- Rassemble des spécialistes de diverses disciplines
 - Des informaticiens
 - Des bibliothécaires
 - Des historiens
 - Des musicologues
 - Des théoriciens de la musique
 - Etc. etc.

UNE ORGANISATION

- Une structure de gouvernance
 - Avec bureau élu tous les 3 ans
- Une équipe technique
 - Des outils
 - Une assistance
- Des groupes d'intérêts
 - Mensural Interest Group
 - Metadata and Cataloging Interest Group
 - Neumes Interest Group
 - Tablature Interest Group
 - Linked Data Interest Group
 - Analysis Interest Group
 - Digital Pedagogy Interest Group

HISTORIQUE

- 1999 Perry Roland crée un schéma XML (DTD) – *Document Type Definition*
- En s'inspirant de la TEI, le nom évolue pour devenir la MEI
- 2000 les premiers travaux sur la MEI sont présentés lors de la première conférence ISMIR (International Society for Music Information Retrieval)
- 2005 des échantillons de partitions sont créés
- 2007 Premier résultat de collaborations exposé lors de conférences à Paderborn
- Reçoit un premier soutien financier Germano-Américain (DFG/NEH)
- 2013 Première conférence sur la MEI, MEC à Mayence qui devient le siège social.

MEC

Music Encoding Conference

- 2014 : Charlottesville (USA)
- 2015 : Firenze (Italie)
- 2016 : McGill (Montréal)
- 2017 : Université de Tours – Musica I (France)
- 2018 : University of Maryland (USA)
- 2019 : Wien universität (Autriche)
- 2020 : Tufts university (USA)
- 2021 : Universidad de Alicante (Espagne)
- 2022 : Dalhousie university, Halifax (Canada)
- 2023 ?

MEI – OPEN SOURCE

- Distribué sous une licence en *open source* : [Educational Community License Version 2](#)
- La MEI fournit un cadre flexible et extensible libre
 - dans le sens de gratuité d'acquisition
 - dans le sens de donner à ses utilisateurs la liberté de l'utiliser comme ils le souhaitent

UN LANGAGE DE BALISAGE

- Sous la forme d'un schéma XML (extensible Markup language)
 - Détaillé dans un guide de bonnes pratiques ([MEI guidelines](#))
- Un langage qui décrit et enregistre les différentes caractéristiques de la musique
 - Caractéristiques physiques (notation musicale) – (Body)
 - Caractéristiques intellectuelles (les métadonnées) – (Header)

UN LANGAGE DE BALISAGE

Le « Header »

où l'on retrouve les métadonnées

Le « Body »

Où l'on retrouve la notation musicale

```
ex. 1: Per me si va Dante.mai
1 <?xml version="1.0" encoding="UTF-16" ?>
2 <mei xml:id="m-1" meiversion="4.0.1" xmlns="http://www.music-encoding.org/ns/mei" xmlns:xlink="http://www.w3.org/1999/xlink">
3   <meiHead xml:id="m-2">
4     <fileDesc xml:id="m-3">
5       <titleStat xml:id="m-4">
6         <title xml:id="m-14"/>
7         <respStat xml:id="m-15">
8           <persName xml:id="m-16"/>
9         </respStat>
10      </titleStat>
11      <pubStat xml:id="m-17">
12        <availability xml:id="m-18">
13          <useRestrict xml:id="m-19">Copyright © </useRestrict>
14        </availability>
15      </pubStat>
16    </fileDesc>
17    <encodingDesc xml:id="m-5">
18      <appInfo xml:id="m-6">
19        <application xml:id="sibelius" isodate="2022-11-29T08:44:53Z" version="20220700">
20          <name xml:id="m-8" type="operating-system">Mac OS X Mountain Lion</name>
21        </application>
22        <application xml:id="sibelius" type="plugin" version="4.0.0">
23          <name xml:id="m-10">Sibelius to MEI 4 Exporter (4.0.0)</name>
24        </application>
25      </appInfo>
26    </encodingDesc>
27    <workList xml:id="m-11">
28      <work xml:id="m-12">
29        <title xml:id="m-13"/>
30      </work>
31    </workList>
32  </meiHead>
33  <music xml:id="m-21">
34    <body xml:id="m-22">
35      <div xml:id="m-23">
36        <score xml:id="m-25">
37          <scoreDef xml:id="m-26" lyric.name="Plantin MT Std" meter.count="3" meter.unit="2" music.name="Opus Std" page.bottom="12.7mm" page.height="297mm" page.leftmargin="20mm" page.rightmargin="20mm" page.topmargin="12.7mm" page.width="210mm" ppq="256" spacing.staff="11" spacing.system="18.5" text.name="Plantin MT Std" vu.height="0.7mm">
38            <staffGrp xml:id="m-27">
39              <staffDef xml:id="m-28" n="1" symbol="bracket">
40                <staffDef xml:id="m-29" clef.line="2" clef.shape="C" key.mode="major" key.sig="1f" lines="5" n="1">
41                  <label xml:id="m-29" Soprano /label>
42                  <labelAbbr xml:id="m-30" S </labelAbbr>
43                  <i== voice.female.soprano.ensemble,ah ==>
44                  <instrDef xml:id="m-32" midi.channel="1" midi.pan="26" midi.volume="100"/>
45                </staffDef>
46                <staffDef xml:id="m-33" clef.line="4" clef.shape="F" key.mode="major" key.sig="1f" lines="5" n="2">
47                  <label xml:id="m-34" Bass /label>
48                  <labelAbbr xml:id="m-35" B </labelAbbr>
49                  <i== voice.male.bass.ensemble,ah ==>
50                  <instrDef xml:id="m-37" midi.channel="1" midi.pan="181" midi.volume="100"/>
51                </staffDef>
52              </staffGrp>
53            </scoreDef>
54          <section xml:id="m-39">
55            <pb xml:id="m-20"/>
56            <sb xml:id="m-42"/>
57            <measure xml:id="m-40" n="1">
58              <staff xml:id="m-42" n="1">
59                <layer xml:id="m-43" n="1">
60                  <note xml:id="m-44" dur="2" dur.ppq="512" oct="4" pname="f" pnum="66" stem.dir="up" istamp.real="00:00:00" vel="0">
61                    <accid xml:id="m-45" accid="s"/>
62
```

UNE STRUCTURE

- Un élément de base
la balise `<mei>` qui ouvre le document et la balise qui fermera le document `</mei>`
- Une réf. Externe
`<mei xml:id="m-1" meiversion="4.0.1" xmlns="http://www.music-encoding.org/ns/mei" xmlns:xlink="http://www.w3.org/1999/xlink"> </mei>`
- Deux éléments « enfant » imbriqués (le header et le body)
`<mei >`
 `<meiHead> </meiHead>`
 `<music> </music>`
`</mei>`

(Structure suite)

<MEI>: élément de base

<meiHead>: un container pour toutes les metadonnées **</meiHead>**

<music>: un container pour la notation musicale

<score>: vue complète de la partition

<scoreDef>: définition de la partition (portées, instruments, clés, mensuration etc....)

<mDiv>: “les divisions” musicale, movement

<section>: les sections, souvent identifié par l’utilisation de doubles barres

<measure>: la mesure

<staff>: identifiant de la portée

<layer>: l’identifiant sur la portée

<note>, **<rest>**, **<chord>**, l’ensemble des éléments de la notation musicale

<slur>, **<tie>**, **<hairpin>**, **<dynam>**: les éléments autour de la portée (liaison de phrasée, de valeur ajoutée, dynamiques etc.

<accid> **<verse>**

</layer>

</staff>

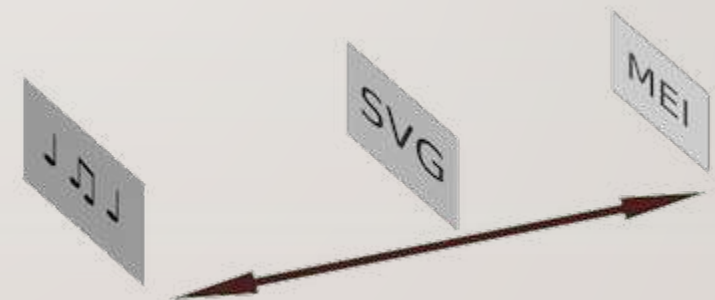
</measure>

</music>

</MEI>

VEROVIO

- Verovio, développée par le bureau suisse du RISM, est une librairie pour graver des partitions de musique en MEI (Music Encoding Initiative) en SVG
- Verovio est conçue comme un outil de conversion sans aucune dépendance vis-à-vis de frameworks ou de bibliothèques. Verovio implémente son propre moteur de visualisation, et rend un SVG avec tous les symboles musicaux qui y sont intégrés, sans dépendre de polices externes.
- Verovio est modulaire, il peut être utilisé dans différents contextes, comme une boîte à outils JavaScript ou Python par exemple. Verovio suit la spécification SMuFL (Standard Music Font Layout) et sa police peut être changée pour personnaliser le rendu de sortie. Il est open-source et est disponible sur GitHub.



```

52     </staffGrp>
53   </staffGrp>
54 </scoreDef>
55 <section xml:id="m-39">
56   <pb xml:id="m-20"/>
57   <sb xml:id="m-41"/>
58   <measure xml:id="m-40" n="1">
59     <staff xml:id="m-42" n="1">
60       <layer xml:id="m-43" n="1">
61         <note xml:id="m-44" dur="2" dur.ppq="512" oct="4" pname="f" pnum="66" stem.dir="up" tstamp.real="00:00:00" vel="0">
62           <accid xml:id="m-45" accid="s"/>
63           <verse xml:id="m-52" n="1">
64             <syl xml:id="m-53">Per</syl>
65           </verse>
66         </note>
67         <note xml:id="m-46" dur="4" dur.ppq="256" oct="4" pname="f" pnum="66" stem.dir="up" tstamp.real="00:00:01.2" vel="0">
68           <accid xml:id="m-47" accid.ges="s"/>
69           <verse xml:id="m-54" n="1">
70             <syl xml:id="m-55">me</syl>
71           </verse>
72         </note>
73         <note xml:id="m-48" dur="4" dur.ppq="256" oct="4" pname="f" pnum="66" stem.dir="up" tstamp.real="00:00:01.8" vel="0">
74           <accid xml:id="m-49" accid.ges="s"/>
75           <verse xml:id="m-56" n="1">
76             <syl xml:id="m-57">si</syl>
77           </verse>
78         </note>

```

MEI Friend: Verovio engraving

Verovio: 3.9.0-3c1560c

L'OBJECTIF DE LA MEI

- Création d'un système de codage qui réponde à des exigences précises :
 - Représenter toute la complexité sémantique et structurelle de la notation musicale
 - Intégrer toutes les caractéristiques expressives de la notation :
 - Des éditions traditionnelles en fac-similé
 - Des éditions critiques
 - Et des éditions performatives
 - Créer une norme publique et ouverte, Indépendante des plate-formes
 - Supporter l'analyse scientifique, la variété des rendus numériques et imprimés

CRÉATION D'UN MODÈLE RICHE

- Qui permette l'encodage de la musique occidentale mais pas seulement
- Conçu par une communauté scientifique pour une utilisation scientifique mais pas seulement
- Conçu sur une structure modulaire permettant son utilisation en fonction des objectifs
 - Assurant les fonctions communes des éditions traditionnelles (Fac-similé, éditions critiques et performatives)
 - Permettant le développement d'archives internationales complètes et permanentes
 - Intégrant toutes les formes de recherche (analyse, éditions etc...)
- Basé sur des normes ouvertes et indépendante de la plate-forme

MEI ET MUSIC XML (2 PHILOSOPHIES DIFFÉRENTES)

MUSIC XML

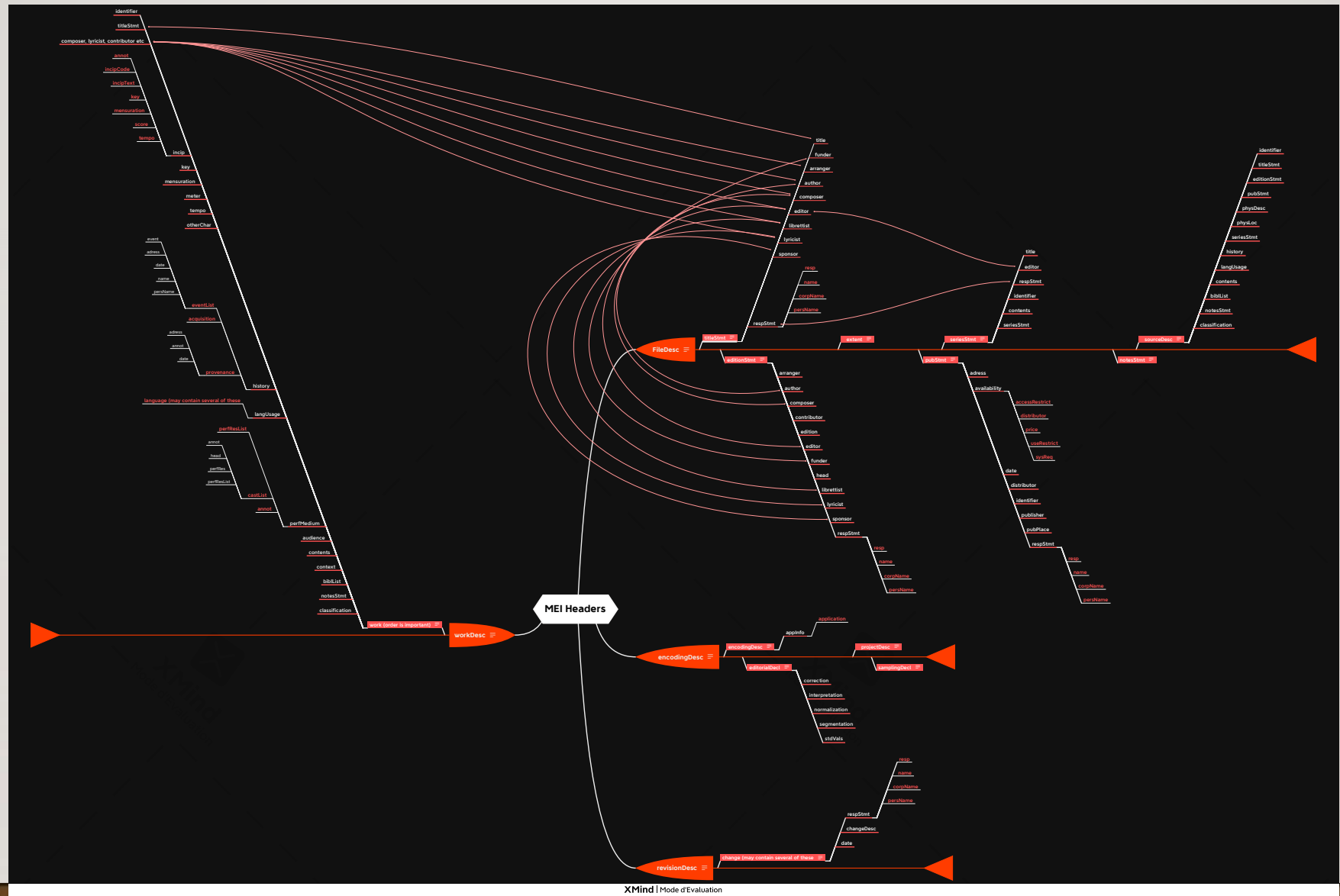
- Basé sur XML
- Format d'échange entre les logiciels de notation musicale
- Structuré par voix

MEI

- Basé sur XML
- Pas de format d'échange pour l'instant
- Structuré par mesure
- Intègre des infos sur la notation
- Intègre les contenus intellectuels de manière structurée et systématique

LES AVANTAGES DE LA MEI : DE NOMBREUSES MÉTADONNÉES

- `<titleStmt>`
 - `<title>Missa Je suis déshéritée</title>`
 - `<title type= "Part">Kyrie</title>`
 - `<composer>Nicolas de Marle</composer>`
 - `<editor>Adrian Le Roy</editor>`
 - `<editor>Robert Ballard</editor>`
- `<pubStmt>`
 - `<PersName auth="VIAF" auth.uri="https://viaf.org/viaf/44339698/#Le_Roy,_Adrien,_1520?-1598" role="publisher">`
 - Adrian Le Roy
 - `</persName>`
 - `<publisher>Robert Ballard</publisher>`
 - `<pubPlace>Paris</pubPlace>`
 - `<address>Rue Jean de Beauvais</address>`
 - `<date>1557</date>`



LES AVANTAGES DE LA MEI : UN LANGAGE PLUS APPROPRIÉ POUR L'ORDINATEUR

- MusicXML :

- `<note default-x="223.41" default-y="-240.55">`
- `<pitch>`
- `<step>D</step>`
- `<octave>4</octave>`
- `</pitch>`
- `<duration>18</duration>`
- `<type>half</type>`
- `<dot/>`
- `<stem>down</stem>`

- MEI :

- `<note xml:id="n1lg5u3l" dots="1" dur.ppq="18"`
`dur="2" oct="4" pname="d" stem.dir="down">`



LES AVANTAGES DE LA MEI : CODER LA SÉMANTIQUE D'UNE ŒUVRE

avec légèreté

Musical notation in 4/4 time, treble clef, key of B-flat. The melody consists of eighth notes with a triplet of eighth notes in the second measure. A red arrow points from the text 'avec légèreté' to the first measure, and another red arrow points from the text 'avec lourdeur' to the first measure.

avec lourdeur

Musical notation in 4/4 time, treble clef, key of B-flat. The melody consists of eighth notes with a triplet of eighth notes in the second measure. A red arrow points from the text 'avec légèreté' to the first measure, and another red arrow points from the text 'avec lourdeur' to the first measure.

```
<measure n="1">  
  <dir dir.ges="avec lourdeur"> avec légèreté  
</dir>
```

```
<note dur=32 oct ="4" pname="f" accid="s"  
  accid.ges="n"/>
```


LES AVANTAGES DE LA MEI : CODER LA SÉMANTIQUE D'UNE ŒUVRE

A musical staff in mensural notation with a treble clef and a common time signature (C). The staff is divided into three measures by vertical dashed lines. The first measure contains two square notes on the second line. The second measure contains a blue diamond note on the second line, followed by three black diamond notes on the second, first, and second lines, and a black dot on the second line. The third measure contains a black diamond note on the second line, a black diamond note on the first line, and a square note on the second line. Below the staff, the lyrics 'Tri - bum que non ab - ho - ru - it' are written. The word 'que' is highlighted in blue.

```
<staffDef notation.type=mensural.black lines="5" clef.shape="G" clef.line="2" modusminor="2" tempus="2"/>  
<note dur= "brevis" dur.quality="imperfecta"/>  
<note dur= "brevis" dur.quality="imperfecta"/>  
<note dur= "semibrevis" num= "3" numbase= "2"/>  
<note dur= "semibrevis" num= "3" numbase= "1"/>  
...  
<dot from=div/>
```



FINALITÉ DE LA MEI

QUELQUES EXEMPLES

musica

2

GAFFURIUS CODICES ONLINE

SCOLA CANTORUM BASILIENSIS

The screenshot displays the Gaffurius Codices Online interface. At the top, there is an orange navigation bar with logos for Fachhochschule Nordwestschweiz Hochschule für Musik, SCHOLA CANTORUM BASILIENSIS, Musik Akademie Basel, and Fern Schu Basl. Below the navigation bar, the page title is "Gaffurius Codices Online". The main content area shows the title "MCE 01-01 Hodie nobis de virgine" and "Edition". A "Motet" section includes links for "+ Sources", "+ Edition & Translation", and "+ Commentary". The central part of the page features a musical score for "MCE 01-01 Hodie nobis de virgine" with four vocal parts: Cantus, Altus, Tenor, and Bassus. The score is in G major and 4/4 time, starting with the instruction "loco Introitus". The lyrics are: "Ho - di - e no - bis de vir - gi - ne Chris". The interface includes a search bar, a zoom level of 40%, and a PDF download option.

GESUALDO ONLINE

Ricercar-Lab – CESR



The screenshot displays the homepage of the Gesualdo Online project. The page features a dark blue header with the title "Gesualdo Online" and a search bar. Below the header is a navigation menu with links for "The Project", "On Gesualdo", "Browse", and "Collaborative Edition". The main content area is divided into four sections: "The Project", "On Gesualdo", "Works", and "Collaborative Edition". Each section contains a brief description and a "Read more >" link. The background of the website is a light beige color with a faint, ornate floral pattern on the left side.

Gesualdo Online

The Project On Gesualdo Browse Collaborative Edition

The Project

Gesualdo Online is the website dedicated to the complete work of Carlo Gesualdo da Venosa (1566-1613), one of the major composers of the late Italian Renaissance. The project collects the entire production of Carlo Gesualdo, which consists of more than 200 edited pieces of music and 39 references to... [Read more >](#)

On Gesualdo

Carlo Gesualdo da Venosa (8 March 1566 – 8 September 1613) was an Italian musician, who was Prince of Venosa and Count of Conza. As a musician he is best known for writing intensely expressive madrigals and pieces of sacred music that use a chromatic language not heard again until the late 19th century. He is also known for his cruelty and lewdness: the best known fact of his life is his gruesome killing of his first wife and her lover upon finding them in *flagrante delicto*. [Read more >](#)

Works

The **Works** section is structured according to Dublin Core standards and is organised through the Omeka web publishing system. This feature permits access to the edition of Gesualdo's music in a very simple way, as in a classical interoperable digital library, allowing the user to explore the list o... [Read more >](#)

Collaborative Edition

Based on the newest web technologies available in the fields of digital musicology and "dynamic" editions, the Gesualdo Online Project is conceived as a collaborative edition. The musicological and musical community interested in Gesualdo's music is invited to create an account on the project website and to collaborate. The project provides the musical transcriptions realized starting from the first available and complete early edition of each of Gesualdo's compositions. These transcriptions will be used as base text, on which variants from other sources, emendations and reconstruction... [Read more >](#)

MODE MARENZIO ONLINE DIGITAL EDITION

- University of Pennsylvania
- RISM
- Columbia university

The screenshot displays the MODE Marenzio Online Digital Edition interface. The main area shows a musical score for '4. Anima cruda sì, ma però bella' with five staves: Canto, Alto, Quinto, Tenore, and Basso. The lyrics are: 'A - - ni - ma cru - - da sì, ma pe - rò bel - - la, Non mi ne - gar, A - - ni - ma cru - da sì Non mi ne -'.

On the left, there is a sidebar with the following sections:

- Display**: Zoom: 40%
- Page layout**: Horizontal / Vertical
- Page [1-6]**: Navigation buttons
- Options**: Modern clefs / Original clefs, Show critical notes in the score
- Recording**: A thumbnail for 'LUCA MARENZIO IL PASTOR FIDO LA PEDRINA FRANCESCO LAVERIO PEDRINI'.
- Tools**: PDF button
- Navigation**: Up arrow, 3. Donna de l'alma mia, de la mia vita

At the top, there is a 'MODE' header with 'Book VI for five voices', 'Critical apparatus', and 'Text' options. A progress bar shows '1:01 / 1:52'.

At the bottom, there is a 'Music' section with a table of variants:

Measures	Sources - Voices	Variants
21-22	AnGa-1594 AnGa-1603 Ma-Ga-1614	Q SM b2-SB b2-SM c3 instead of SM c3-SB b2-SM b2 (corrected based on the <i>locus parallelus</i> : T, 39-40)
60	Ma-Ga-1614 - B	a sharp (in the fourth space) is erroneously inserted before c2

Below the table is a 'Text' section.

MOVI THE DIGITAL MOZART SCORE VIEWER

Morzartium (Salzburg Autriche)

The screenshot displays the MoVi digital Mozart score viewer interface. The main area shows musical notation for Violino I, Violino II, Viola, and Violoncello e Basso. The score is in G major (one sharp) and 3/4 time, marked 'Allegro' and 'f'. The interface includes a navigation bar at the top with 'MoVi The digital MOZart score Viewer', a 'Work selection' dropdown, and 'EN' language options. On the right, there is an 'OVERVIEW • DASHBOARD' section with the following information: 'Divertimento in D', 'K. 136 NMA digital', '1st mvt.', 'Allegro', and a link to 'View score in the NMA Online'. Below this, a section titled 'Select a different unit of this work:' lists three options: '1: Allegro', '2: Andante', and '3: Presto'. At the bottom, there is a search bar with 'Search work (by K.nr.): 136' and a dropdown arrow. The bottom navigation bar contains playback controls (stop, previous, play, next), a page indicator '[page 1 of 10]', a 'Go to' field with 'measure' and 'page' options, a 'Original line breaks' checkbox, and a 'Zoom' slider.

LOST VOICES PROJECT

- Ricercar-Lab – CESR
- Haverford College

The screenshot shows the homepage of the 'The Lost Voices Project' website. At the top right, there are links for 'Request account | Login' and a button for 'Explore Les Livres'. The main title is 'The Lost Voices Project', followed by a subtitle: 'Companion resource to *Les livres de Chansons Nouvelles de Nicolas Du Chemin (1549–1568)*, hosted by the *Centre d'Études Supérieures de la Renaissance in Tours, France*'. Below this is a navigation bar with links for 'The Project', 'Browse', 'Reconstructions', 'Links', and 'Help', along with a search box and an 'Advanced search' link. The main content area features a large musical notation snippet starting with a large 'D' and the lyrics 'Ire me fault par desespoir cō trainç,'. Below the notation is a 'Project News' section, followed by 'VISUALIZATION TOOLS' which lists several research papers and presentations. At the bottom, there is a 'FREE USER ACCOUNTS' section explaining how to create an account.

The Lost Voices Project
*Companion resource to *Les livres de Chansons Nouvelles de Nicolas Du Chemin (1549–1568)*, hosted by the *Centre d'Études Supérieures de la Renaissance in Tours, France**

[Request account | Login](#) [Explore Les Livres](#)

[The Project](#) [Browse](#) [Reconstructions](#) [Links](#) [Help](#) [Advanced search >](#)

D Ire me fault par desespoir cō trainç,

Recent Discussion
No recent comments.

Project News

VISUALIZATION TOOLS
Here you can find various documents and resources for data analysis concerning the Du Chemin Lost Voices Project:

- Similarity Network 2015: [Similar Cadences by Type, Final Tone, and Adjacent Cadence](#)
- Similarity Network 2015: [All Pieces as Strings of Cadences](#)
- Similarity Network 2015: [Similar Pieces according to Cadential Structure and Final Tone](#)
- [Freedman Presentation for International Musicological Society 2015 on Visualizations](#)

FREE USER ACCOUNTS
Our free user accounts allow you to take private 'notes' about individual works and reconstructions. You can also participate in live public 'discussions' about any work. To request an account, just send an email to admin@digitalduchemin.org (or follow the link to request an account at the upper right). For more information

CITATIONS: RENAISSANCE IMITATION MASS

- Haverford College
- Ricercar-Lab – CESR

The screenshot displays the CRIM website interface. At the top right, there is a link for "Request account | Login". The main header features the title "CRIM" and the subtitle "Citations: The Renaissance Imitation Mass Project". Below this is a dark navigation bar with links for "About", "Documents", "Analysis", and "Forum", along with a search bar and a link for "Advanced search". The main content area is titled "Introduction" and contains the following text:

Building upon recent developments in digital music scholarship, **CRIM (Citations: The Renaissance Imitation Mass)** implements a new kind of quotable text for music, along with the analysis and commentary that illuminates its workings. The CRIM project is the product of a long partnership between **Haverford College** and the **Centre d'Études Supérieures de la Renaissance** (Tours, France), and among an international **team** of scholars, students, and information technologists. It grapples with allusive relationships among musical works of the sixteenth century, and with the challenges of modeling scholarly annotations of these connections in the digital domain. Our work charts much new territory, exploring a neglected genre of Renaissance music via technologies that only a few years ago were beyond our grasp. CRIM extends and enhances an topological approach to analysis and digital editions undertaken in **The Lost Voices Project**.

The products of our efforts will include:

- **Vocabularies for Analysis and Annotation**, including music-theoretical language for description and analysis; systems of encoding; and addressable representation. The **Open Annotation** paradigm will be extended to musical scores presented via the **Music Encoding Initiative** standard, thereby creating an innovative ontology for describing any critical commentary about any musical work or passage;
- **Instances and Citations** of theoretical/contrapuntal types, and of kinds of relationships between works. Tracing the connections among these many small-scale observations will inaugurate a new type of multi-author work in musicology, with the capacity for us to collate and cite any person, work, or musical pattern in relation to larger insights about the music;
- **Narratives and Projections** of broader perspectives on changing musical style, analytic paradigms, and cultural contexts through essays and digital examples that explore both individual works and large sets of them, too, in ways previously impossible on account of our limited capacity for managing large numbers of observations, instances, and examples. We will also reflect on the changing state of musical texts, both in Renaissance prints (the new medium of its day) and in digital form (the new medium of our own time), as manifest in both individually-authored and collaborative papers, graduate seminars, and musical classroom discussions hosted on the CRIM website, or published in traditional forms using CRIM citations as enhancements and examples.
- **Pedagogical Modules** that can be used by anyone to advance the study of Renaissance music and digital literacy, using CRIM tools, as well as those of our extended circle of collaborators.

In addition to the various **About** and **Help** pages on this site, please visit the **CRIM Workspace and Editorial Hub** to learn more about CRIM methods and tools.

MEASURING POLYPHONY

DIGITAL ENCODINGS OF LATE MEDIEVAL MUSIC

BRANDEIS UNIVERSITY (USA)

The screenshot shows a digital music score interface. At the top, a red header contains the logo and text: "MEASURING POLYPHONY" and "DIGITAL ENCODINGS OF LATE MEDIEVAL MUSIC". On the right side of the header, there are links for "BROWSE" and "TRA". Below the header, the title "S'ON ME REGARDER / PRENNES I GARDE / HE, MON ENFANT" and the composer "Anonymous" are displayed. A progress bar shows "00.00" on both ends. A button labeled "Switch score to modern notation" is located on the right. The main area contains three systems of musical notation. The first system has three staves: "triplum" (S'on me re - - gar - - de s'on me re - - gar - - de), "motetus" (Pren - - nes i gar - - de s'on me re - - gar - - de), and "tenor" (HE MI EN - - FANT). The second system has two staves: the upper staff (di - - tes le moi trop sui gail - - lar - - de bien l'a - per - -) and the lower staff (trop sui gail - - lar - - de di - - tes le moi pour dieu vous). The third system has two staves: the upper staff (-choi ne puis lais - - sier que mon re - gard ne) and the lower staff (proi car tes m'es - gar - - de dont mout me tar - - - de - -).