

Roundtable discussion New Technologies and Practices for Tablature Encoding

**Basel Lute Days - Schola Cantorum Basiliensis
14th September 2022**

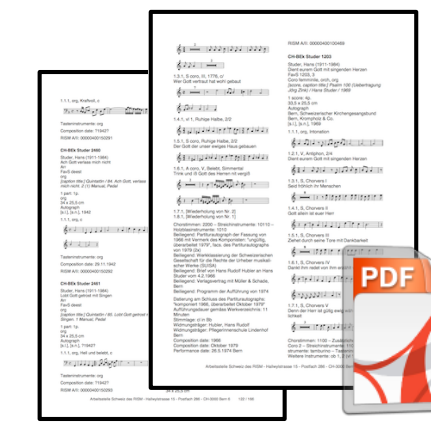
Laurent Pugin



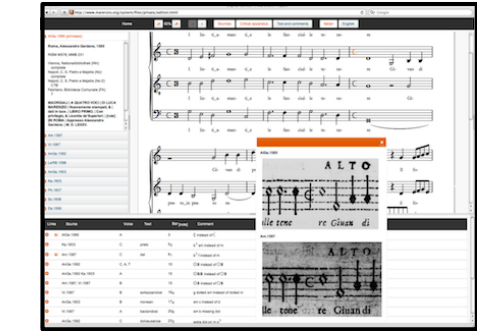
MEI

Music Encoding Initiative

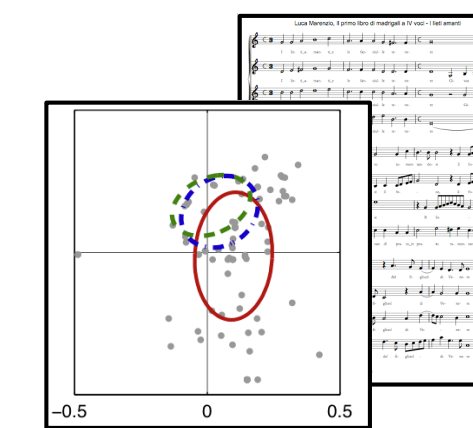
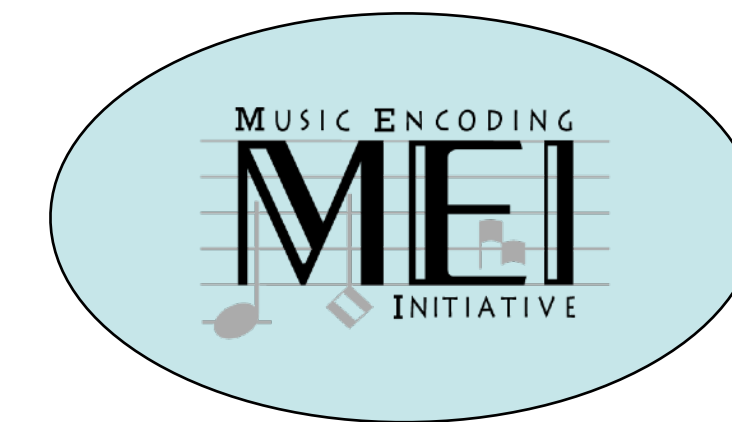
- Started by Perry Roland at University of Virginia
- Inspired by the Text Encoding Initiative TEI
- Modelling the music notation and representing it digitally in a structured and meaningful way
- Explicit distinction of the various encoding domains (e.g., visual, gestural)
- Coverage of a wide range of applications
- Encoding of common Western music notation, but not only
- Open, community-driven and modular



Library catalogs



Digital music editions



Analysis and retrieval



Long term archiving

MEI is not ...

- ... an “official” standard
- ... just a file format

Verovio

Musical notation system 1, measures 27-32. It features a grand staff with treble and bass clefs. The music is in a key with three sharps (F#, C#, G#). It includes dynamic markings such as *f*, *p*, and *Cres* (Crescendo).Musical notation system 2, measures 33-37. It continues the grand staff notation. It includes dynamic markings such as *f*, *p*, and *Cres*. There are also markings for *Loco* and *8* (octave shift).Musical notation system 3, measures 38-43. It continues the grand staff notation. It includes dynamic markings such as *Cres*, *ff*, and *Red.* (Ritardando). There are also markings for *Loco* and *8*.

**A music notation engraving
library for MEI**

Design principles

Rethinking digital engraving

- Responsive music notation layout – as opposed to page-focused output

Rethinking notation in the digital domain

- Notation as an interaction layer with the MEI code acting as a “semantic” representation

Allowing for modular digital engraving

- Suitable to a wide range of music repertoires and of application types

Based on open standards

- SMuFL (Standard Music Font Layout)

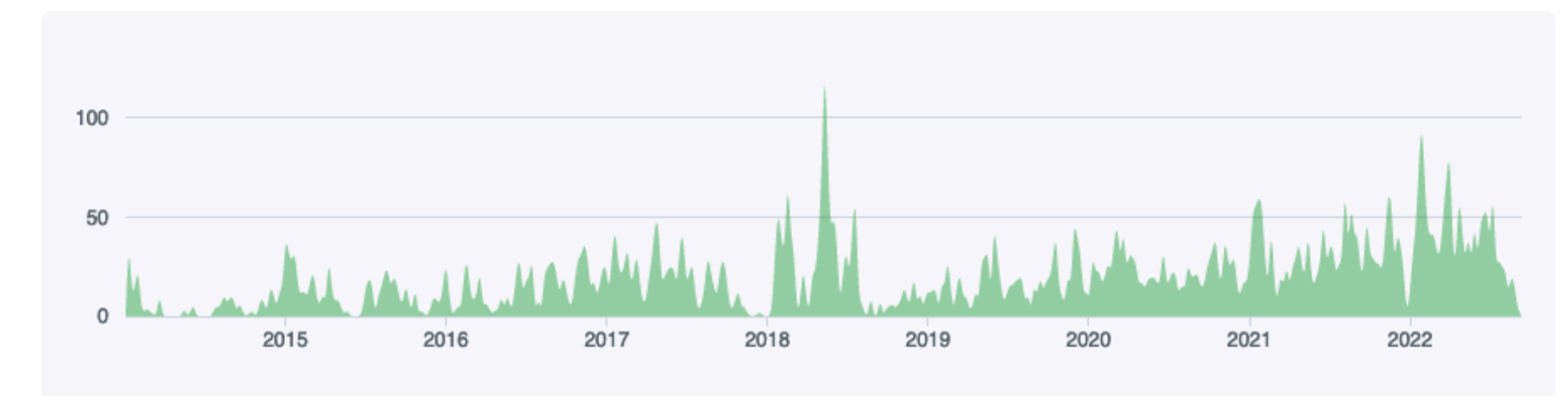
Open source and community oriented



Contributors 52

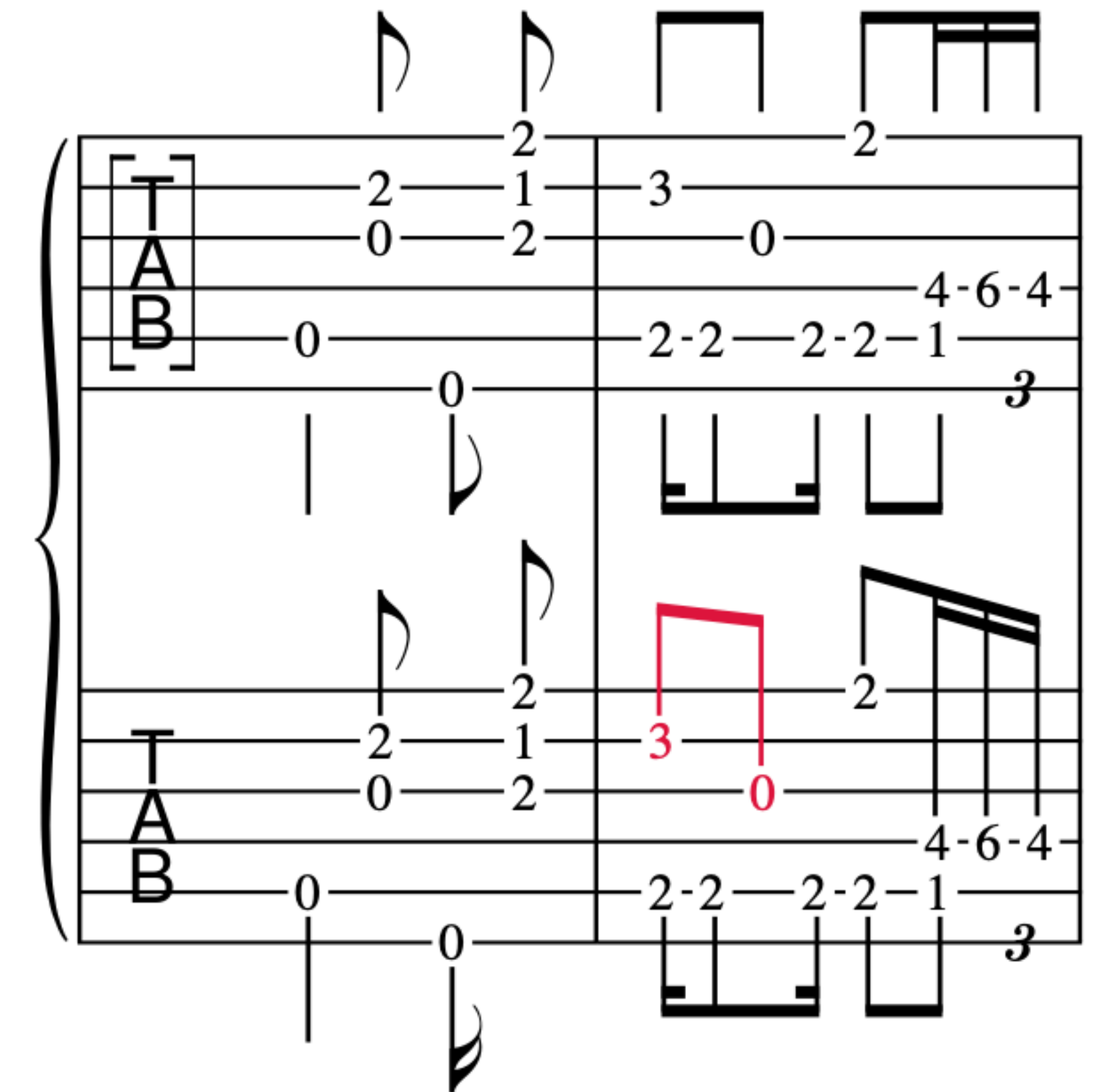
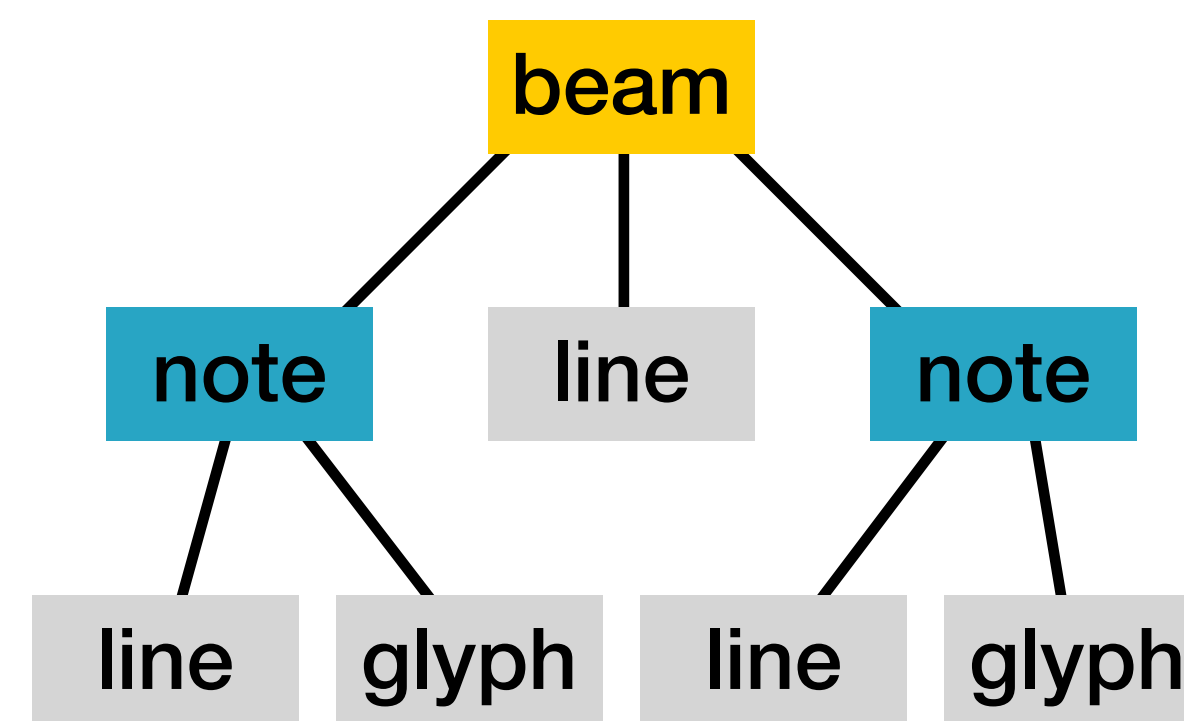
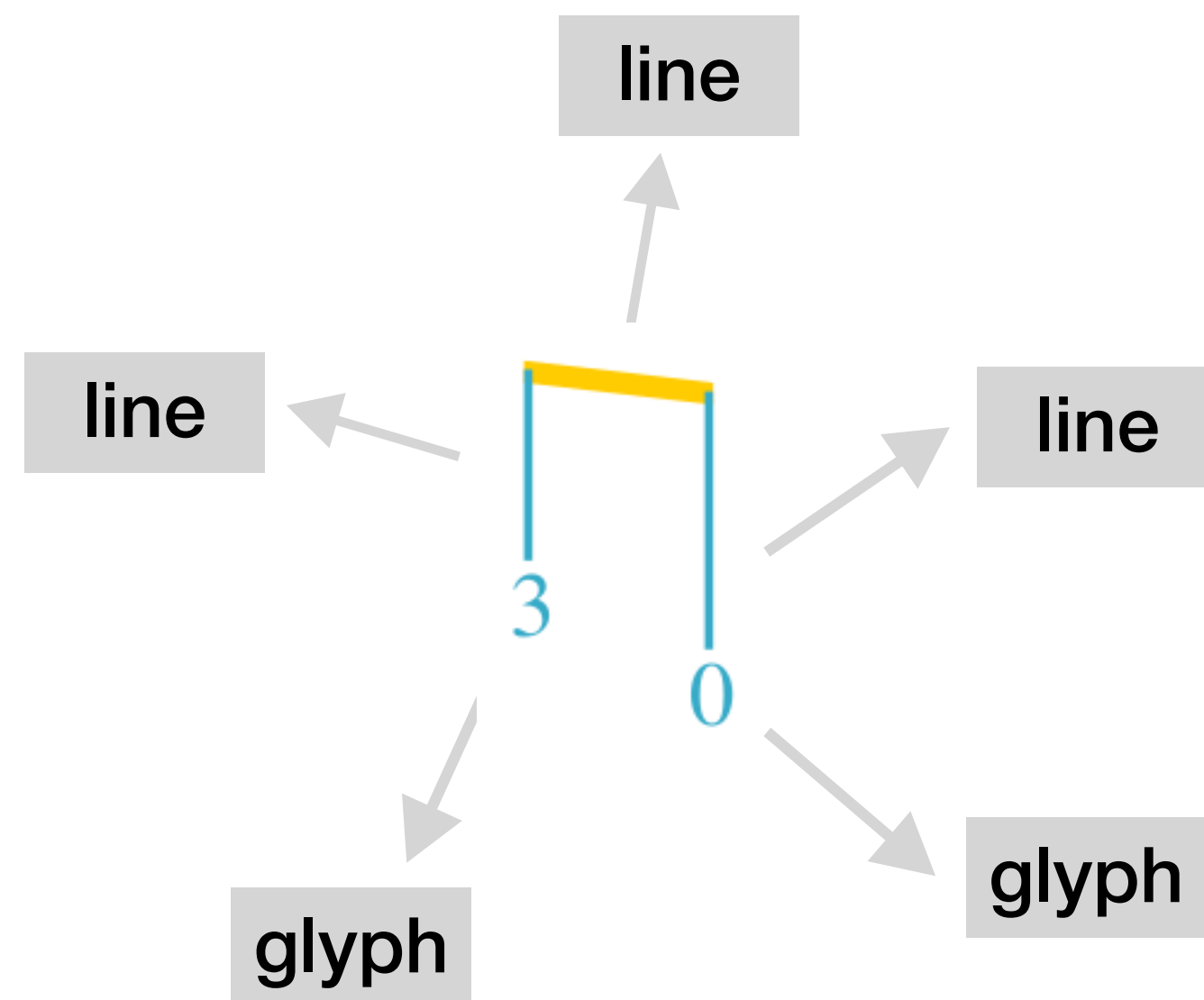


Contributions to develop, excluding merge commits and bot accounts



Interactive music notation

- Verovio produces SVG (Scalable Vector Graphics), a vector-based graphics in XML format
- SVG can be used on the the web and is supported by most Internet browsers by default
- It acts as a semantically structured image which can be addressed and modified with standard web technologies



A **beam and its content** can be addressed and modified because the MEI structure is preserved in the SVG image structure

Modular music notation engraving

MEASURING POLYPHONY
DIGITAL ENCODINGS OF LATE MEDIEVAL MUSIC

BROWSE TRANSCRIBE ABOUT

FLORET CUM VANA GLORIA / FLORENS VIGOR ULCISCENDO / [TENOR]
Anonymous

0:00 0:00 Switch score to modern notation

Source
Click this link for more information on this MS (DIAMM)

Downloads
MEI files: CMN SCORE | MENS SCORE
PDF files: PDF SCORE

Commentary
Scanned file corrected from PMFC. Rhythmic durations augmented following our project's transcription conventions. Pitches, rhythms and mensural notation features checked and corrected against manuscript source. Text follows PMFC edition.

Editorial remarks

Measuring Polyphony

HOME ABOUT BROWSE SEARCH ANALYSIS EDITORIAL POLICIES PARTICIPANTS

Tasso in Music Project
Digital Edition of the Settings of Torquato Tasso's Poetry, c. 1570–1640

Emiliano Ricciardi, director & general editor
Craig Stuart Sapp, technical director

Musical Editions Literary Transcriptions/Variants

Literary Transcriptions/Variants

For each poem (or excerpt of larger poem), under the tab "Literary Variants" users may find diplomatic transcriptions of the poetic text as it appears in literary sources, both manuscript and printed, and in literary sources. Variant readings across sources are highlighted and displayed dynamically in the right column of the "Literary Variants" page of each poem. The goal of the transcriptions and of the dynamic collation of variants is to facilitate the study of the textual tradition of Tasso's poems and of their transmission to composers.

Sources

Tasso in Music

EUROPEAN ARS NOVA

ANT Viewer

Pagina 1 di 6 Zoom Mostra intera partitura

Modalità collazione

Apparato delle varianti

1 Variants: 2 Testimoni: CtPit CtSq
2 Variants: 1 Testimoni: CPit
3 Variants: 2 Testimoni: CtPit CtSq

Text Grd Author

European Ars Nova

Philippe de Vitry

Soumettre Comparer Déchanter Fleurir >> Blog

1 - Vos pastores adulteri

Or-bis or-ba-tus o-cu-lus in di-e ce-tus res-pi-tat dum com-po-nen-dis lo-cu-lis mi-tra-tus
quis-que mi-li-tat pro-di-tan-dis ne-po-tu-lis <et> pau-per chr-is-tus cla-mi-tat ie-iu-niis uer-bo
po-pu-lis cla-mat iam rau-cis fau-ci-bus ad cor re-di-te fi-li-i sed cum sur-dis sint au-ri-bus
<et> con-temp-to-res im-pi-i in-du-ra-tis cer-ui-ci-bus <et> au-si-te-m<e>-ra-ri-i hiis mox
com-pel-lat uo-ci-bus cur-si-mi-les as-pi-di-bus au-di-re non dig-na-mi-ni mu-tis iam pa-ret ca

Philippe de Vitry

Display

MODE Book VI for five voices Critical apparatus Text

Zoom: 40%

Page layout: Horizontal Vertical

Options: Modern clefs Original clefs Show critical notes in the score

Recording: LUCA MARENZIO IL PASTOR FIDO LA PEDRINA FRANCESCO SAVERIO PEDRINI

Tools: PDF

Navigation: 3. Donna de l'alma mia, de la mia vita 5. Udite lagrimosi

4. Anima cruda sì, ma però bella (Battista Guarini)

Canto: A-ni-ma cru-da sì, ma pe-rò bel-
Alto: A-ni-ma cru-da sì, ma pe-rò bel-
Quinto: A-ni-ma cru-da sì, ma pe-rò bel-
Tenore: -
Basso: A-ni-ma cru-da sì

Non mi ne-gar a l'ul-ti-mo so-spi-
-la, Non mi ne-gar a l'ul-ti-mo so-spi-
-la, Non mi ne-gar a l'ul-ti-mo so-spi-
-la, Non mi ne-gar, non mi ne-gar a l'ul-ti-mo so-spi-

Marenzio Edition

Counterpoint: An Art of Recombination

Model: Josquin Des Prés, Ave Maria

Derivative: Missa Ave Maria: Kyrie

Periodic entry
Voices: [Superius] Altus Tenor Bassus
Melodic interval of entry: 8-1+8-
Time interval of entry: 5/4/4/4
Strict: True
Flexed: False
Flexed, tonal: False
Sequential: False
Added: False
Invertible: False

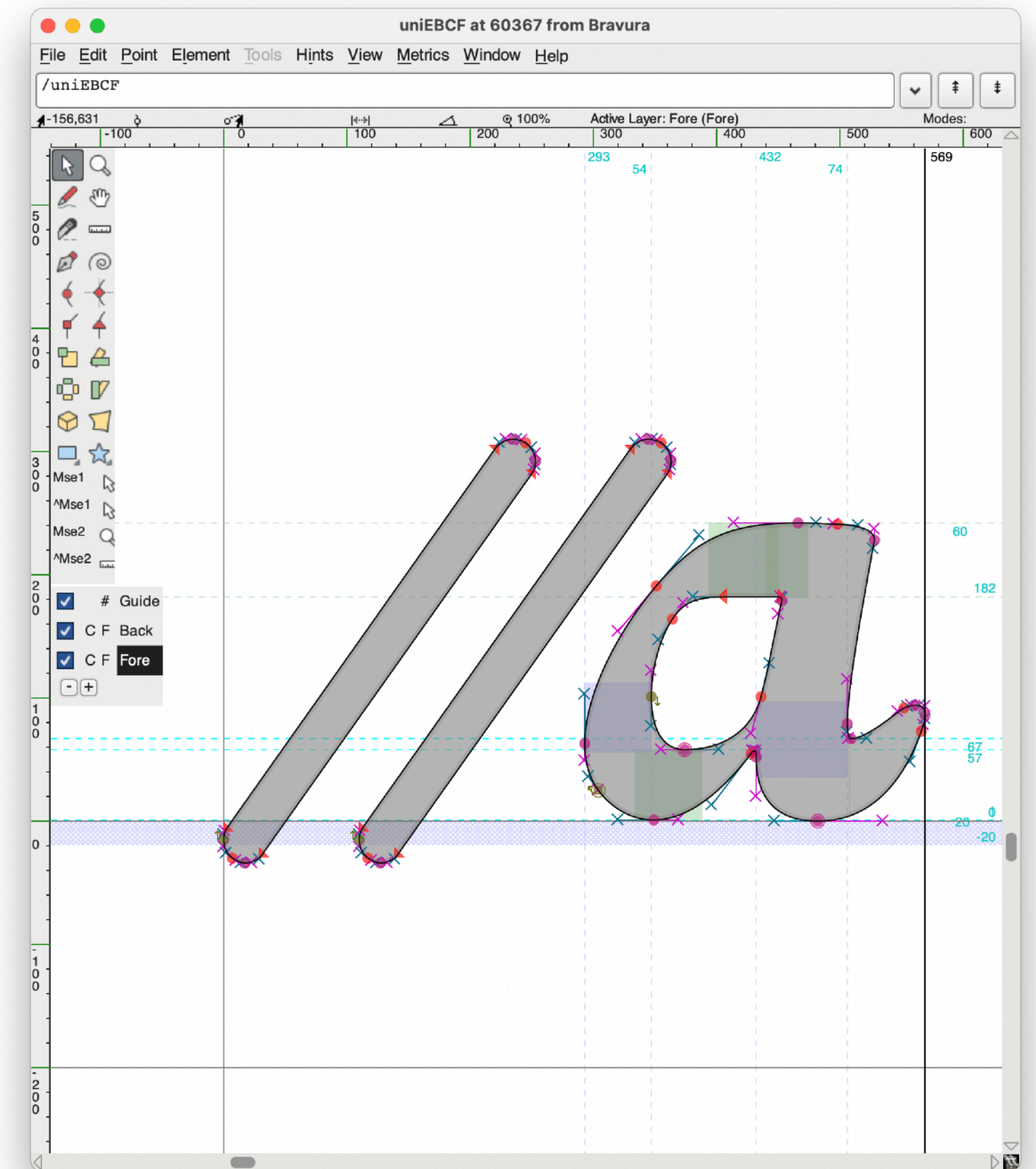
Fuga
Voices: Tenor Bassus Altus Superius Tenor
Melodic interval of entry: 5-5+8-8-
Time interval of entry: 5/1/4/5/5
Periodic: False
Strict: True
Flexed: False
Sequential: False
Inverted: False
Retrograde: False

CRIM Project

SMuFL

Standard Music Font Layout

- Initiated by Steinberg and now developed by the W3C Music Notation Community Group
- Provides a standard way of mapping thousands of musical symbols using the the Unicode Private Use Area
- Provides guidelines and recommendations for metrics, glyph registration and font metadata.
 - “All glyphs should be drawn at a scale consistent with the key measurement that one staff space = 0.25 em.”
- Recommends 2,400 glyphs, plus several hundred further optional glyphs



Renaissance lute tablature (U+EBA0–U+EBBF)

Glyph	Description	Glyph	Description
	U+EBA0 <i>luteStaff6Lines</i> Lute tablature staff, 6 courses		U+EBA1 <i>luteStaff6LinesWide</i> Lute tablature staff, 6 courses (wide)
	U+EBA2 <i>luteStaff6LinesNarrow</i> Lute tablature staff, 6 courses (narrow)		U+EBA3 <i>luteBarlineStartRepeat</i> Lute tablature start repeat barline
	U+EBA4 <i>luteBarlineEndRepeat</i> Lute tablature end repeat barline		U+EBA5 <i>luteBarlineFinal</i> Lute tablature final barline
	U+EBA6 <i>luteDurationDoubleWhole</i> Double whole note (breve) duration sign		U+EBA7 <i>luteDurationWhole</i> Whole note (semibreve) duration sign
	U+EBA8 <i>luteDurationHalf</i> Half note (minim) duration sign		U+EBA9 <i>luteDurationQuarter</i> Quarter note (crotchet) duration sign
	U+EBAA <i>luteDuration8th</i> Eighth note (quaver) duration sign		U+EBAB <i>luteDuration16th</i> 16th note (semiquaver) duration sign
	U+EBAC <i>luteDuration32nd</i> 32nd note (demisemiquaver) duration sign		U+EBAD <i>luteFingeringRHThumb</i> Right-hand fingering, thumb
	U+EBAE <i>luteFingeringRHFirst</i> Right-hand fingering, first finger		U+EBAF <i>luteFingeringRHSecond</i> Right-hand fingering, second finger
	U+EBB0 <i>luteFingeringRHThird</i> Right-hand fingering, third finger		

Recommended stylistic alternates

Glyph	Description	Glyph	Description
	uniEBB0.salt01 <i>luteFingeringRHThirdAlt</i> Right-hand fingering, third finger (alternate)		

Italian and Spanish Renaissance lute tablature (U+EBE0–U+EBFF)

Glyph	Description	Glyph	Description
0	U+EBE0 <i>lutetalianFret0</i> Open string (0)	1	U+EBE1 <i>lutetalianFret1</i> First fret (1)
2	U+EBE2 <i>lutetalianFret2</i> Second fret (2)	3	U+EBE3 <i>lutetalianFret3</i> Third fret (3)
4	U+EBE4 <i>lutetalianFret4</i> Fourth fret (4)	5	U+EBE5 <i>lutetalianFret5</i> Fifth fret (5)
6	U+EBE6 <i>lutetalianFret6</i> Sixth fret (6)	7	U+EBE7 <i>lutetalianFret7</i> Seventh fret (7)
8	U+EBE8 <i>lutetalianFret8</i> Eighth fret (8)	9	U+EBE9 <i>lutetalianFret9</i> Ninth fret (9)
	U+EBEA <i>lutetalianTempoFast</i> Fast tempo indication (de Mudarra)		U+EBEB <i>lutetalianTempoSomewhatFast</i> Somewhat fast tempo indication (de Narvaez)
	U+EBEC <i>lutetalianTempoNeitherFastNorSlow</i> Neither fast nor slow tempo indication (de Mudarra)		U+EBED <i>lutetalianTempoSlow</i> Slow tempo indication (de Mudarra)
	U+EBEE <i>lutetalianTempoVerySlow</i> Very slow indication (de Narvaez)	3	U+EBEF <i>lutetalianTimeTriple</i> Triple time indication
	U+EBF0 <i>lutetalianClefFFaUt</i> F fa ut clef		U+EBF1 <i>lutetalianClefCSolFaUt</i> C sol fa ut clef
	U+EBF2 <i>lutetalianTremolo</i> Single-finger tremolo or mordent		U+EBF3 <i>lutetalianHoldNote</i> Hold note
	U+EBF4 <i>lutetalianHoldFinger</i> Hold finger in place		U+EBF5 <i>lutetalianReleaseFinger</i> Release finger

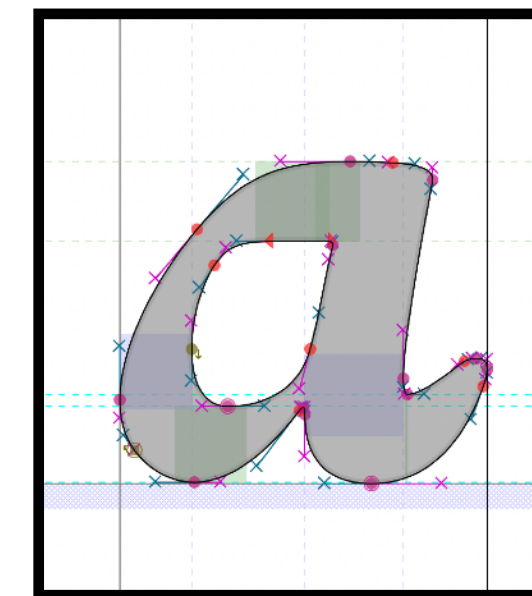
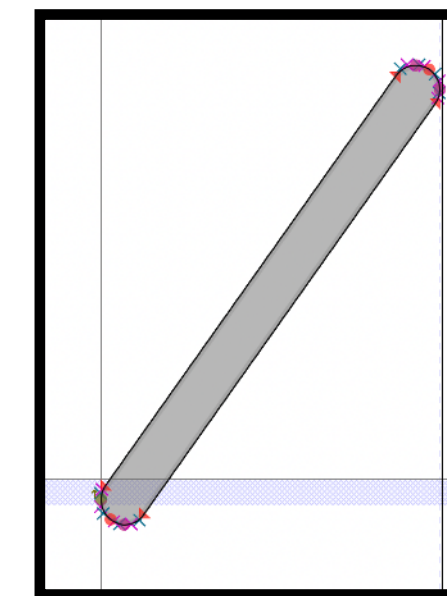
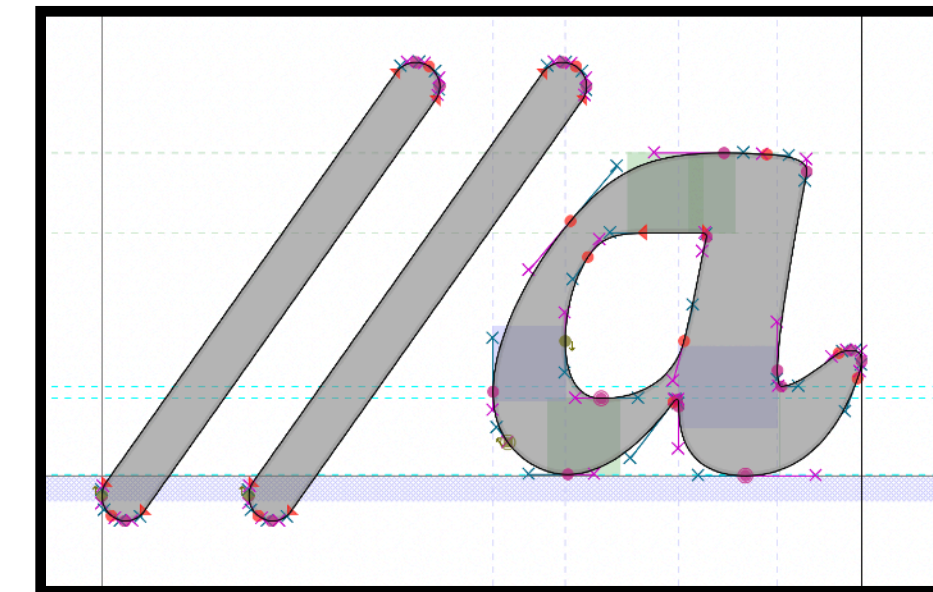
German Renaissance lute tablature (U+EC00–U+EC2F)

Glyph	Description	Glyph	Description
a	U+EC00 <i>luteGermanALower</i> 5th course, 1st fret (a)	b	U+EC01 <i>luteGermanBLower</i> 4th course, 1st fret (b)
c	U+EC02 <i>luteGermanCLower</i> 3rd course, 1st fret (c)	d	U+EC03 <i>luteGermanDLower</i> 2nd course, 1st fret (d)
e	U+EC04 <i>luteGermanELower</i> 1st course, 1st fret (e)	f	U+EC05 <i>luteGermanFLower</i> 5th course, 2nd fret (f)
g	U+EC06 <i>luteGermanGLower</i> 4th course, 2nd fret (g)	h	U+EC07 <i>luteGermanHLower</i> 3rd course, 2nd fret (h)
i	U+EC08 <i>luteGermanILower</i> 2nd course, 2nd fret (i)	k	U+EC09 <i>luteGermanKLower</i> 1st course, 2nd fret (k)
l	U+EC0A <i>luteGermanLLower</i> 5th course, 3rd fret (l)	m	U+EC0B <i>luteGermanMLower</i> 4th course, 3rd fret (m)
n	U+EC0C <i>luteGermanNLower</i> 3rd course, 3rd fret (n)	o	U+EC0D <i>luteGermanOLower</i> 2nd course, 3rd fret (o)
p	U+EC0E <i>luteGermanPLower</i> 1st course, 3rd fret (p)	q	U+EC0F <i>luteGermanQLower</i> 5th course, 4th fret (q)
r	U+EC10 <i>luteGermanRLower</i> 4th course, 4th fret (r)	s	U+EC11 <i>luteGermanSLower</i> 3rd course, 4th fret (s)
t	U+EC12 <i>luteGermanTLower</i> 2nd course, 4th fret (t)	v	U+EC13 <i>luteGermanVLower</i> 1st course, 4th fret (v)
x	U+EC14 <i>luteGermanXLower</i> 5th course, 5th fret (x)	y	U+EC15 <i>luteGermanYLower</i> 4th course, 5th fret (y)
z	U+EC16 <i>luteGermanZLower</i> 3rd course, 5th fret (z)	A	U+EC17 <i>luteGermanAUpper</i> 6th course, 1st fret (A)

SMuFL is a font specification, it is not a font!

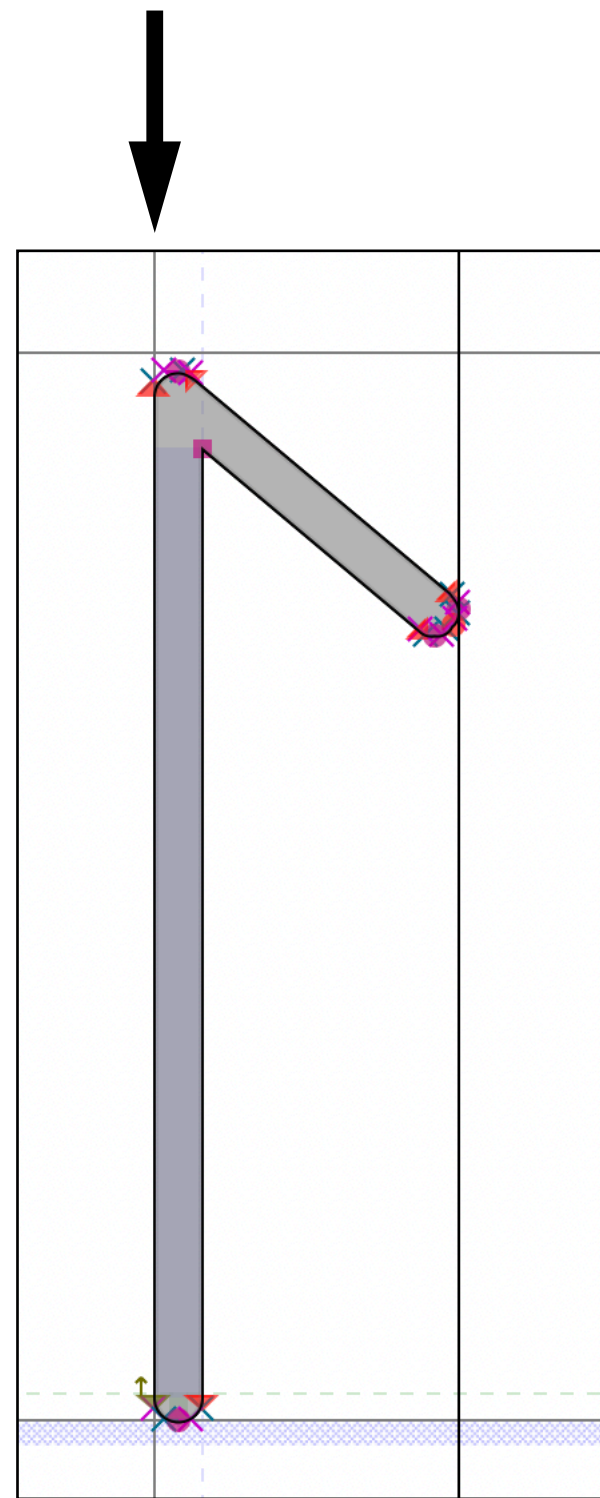
French and English Renaissance lute tablature (U+EBC0–U+EBDF)

Glyph	Description	Glyph	Description
a	U+EBC0 <i>luteFrenchFretA</i> Open string (a)	b	U+EBC1 <i>luteFrenchFretB</i> First fret (b)
c	U+EBC2 <i>luteFrenchFretC</i> Second fret (c)	d	U+EBC3 <i>luteFrenchFretD</i> Third fret (d)
e	U+EBC4 <i>luteFrenchFretE</i> Fourth fret (e)	f	U+EBC5 <i>luteFrenchFretF</i> Fifth fret (f)
g	U+EBC6 <i>luteFrenchFretG</i> Sixth fret (g)	h	U+EBC7 <i>luteFrenchFretH</i> Seventh fret (h)
i	U+EBC8 <i>luteFrenchFretI</i> Eighth fret (i)	k	U+EBC9 <i>luteFrenchFretK</i> Ninth fret (k)
l	U+EBCA <i>luteFrenchFretL</i> 10th fret (l)	m	U+EBCB <i>luteFrenchFretM</i> 11th fret (m)
n	U+EBCC <i>luteFrenchFretN</i> 12th fret (n)	a	U+EBCD <i>luteFrench7thCourse</i> Seventh course (diapason)
/a	U+EBCE <i>luteFrench8thCourse</i> Eighth course (diapason)	//a	U+EBCF <i>luteFrench9thCourse</i> Ninth course (diapason)
///a	U+EBD0 <i>luteFrench10thCourse</i> 10th course (diapason)	x	U+EBD1 <i>luteFrenchMordentUpper</i> Mordent with upper auxiliary
✱	U+EBD2 <i>luteFrenchMordentLower</i> Mordent with lower auxiliary	7	U+EBD3 <i>luteFrenchMordentInverted</i> Inverted mordent
‡	U+EBD4 <i>luteFrenchAppoggiaturaBelow</i> Appoggiatura from below	#	U+EBD5 <i>luteFrenchAppoggiaturaAbove</i> Appoggiatura from above

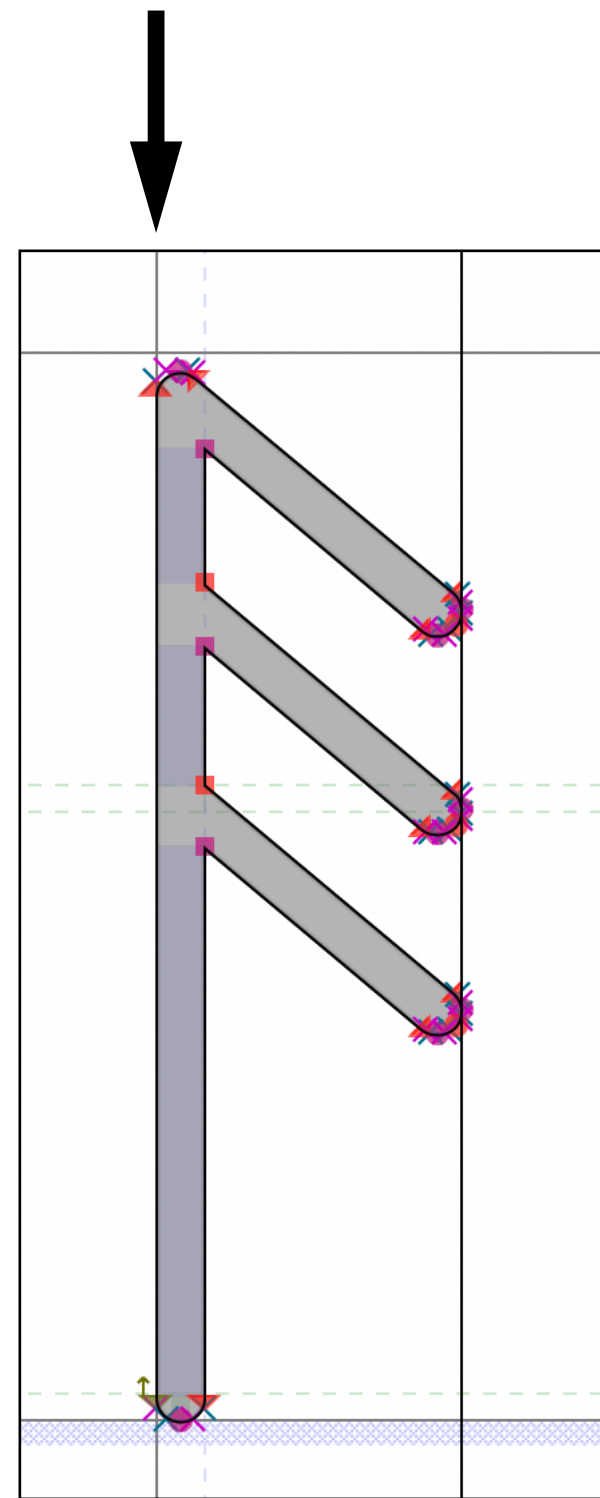


Glyph positioning

Glyph origin

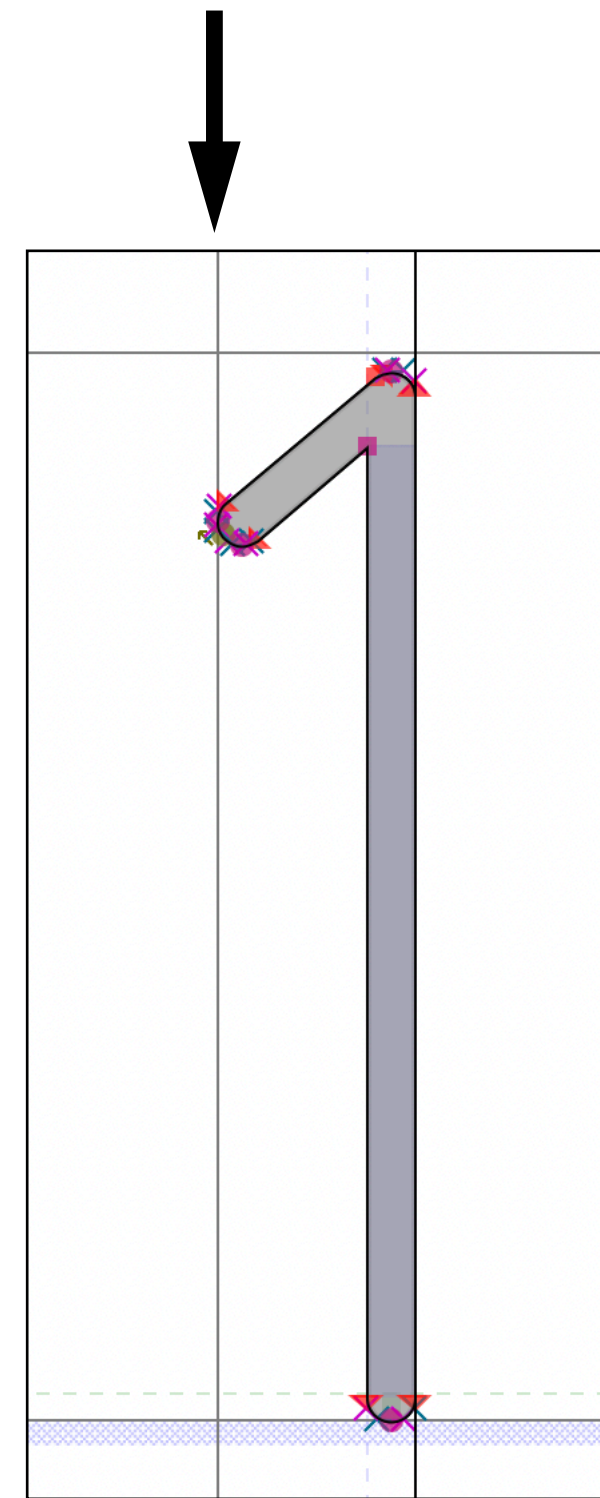


luteDurationHalf



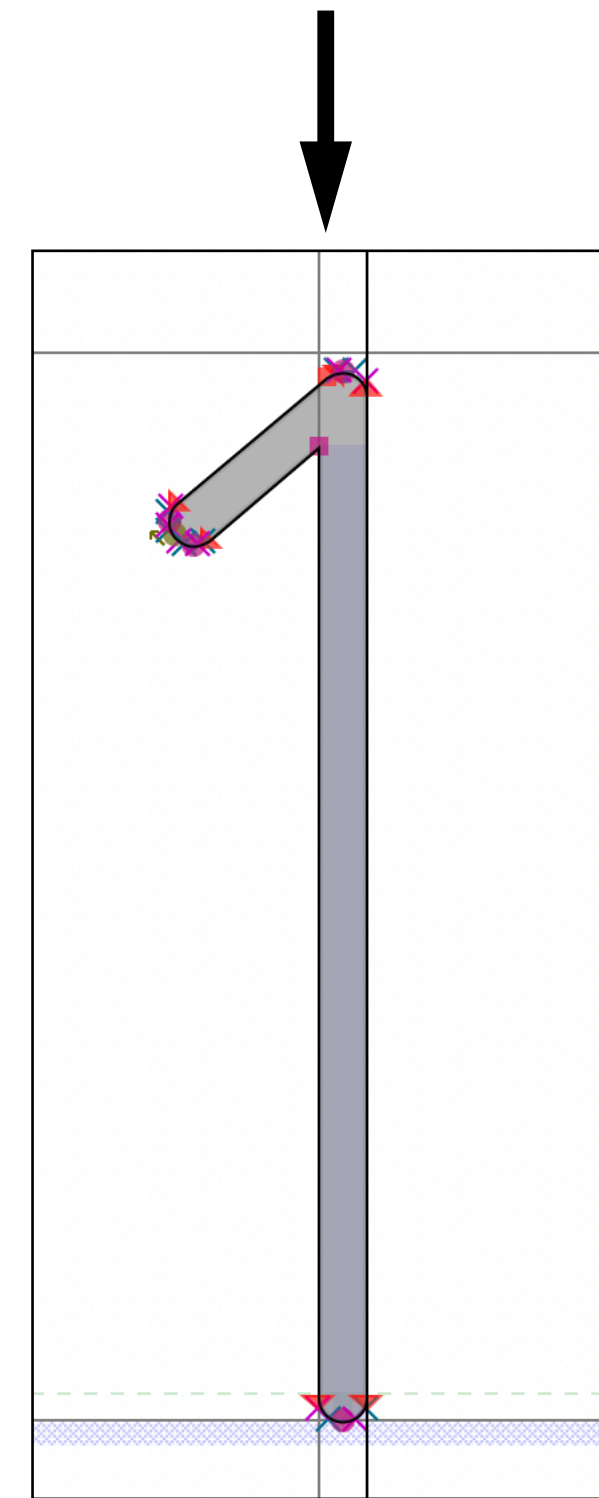
luteDuration8th

Current specification



luteDurationDoubleWhole

Desired specification?



Open-source and community oriented

What should happen next for lute tablature?

- MEI Schema definition
 - Identify corner cases in music sources ... and make compromises in the model
 - MEI is not meant to represent visually exactly every source in the world
- Verovio implementation
 - Coding, coding and coding ...
 - Prepare test examples and track changes
- Font developments
 - Submit proposals for modifications or additions to SMuFL based on example sources
 - Design fonts and font subsets – or make existing fonts SMuFL compliant
- Gather datasets
- Built on all this!

Thank you

<https://www.verovio.org/>

<https://rism.digital/>

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