

Application of Music-Encoding Technologies to Guatemalan Choirbooks

Facilitating Preservation and Musicological Studies of the Colonial Repertoire

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Project Goals

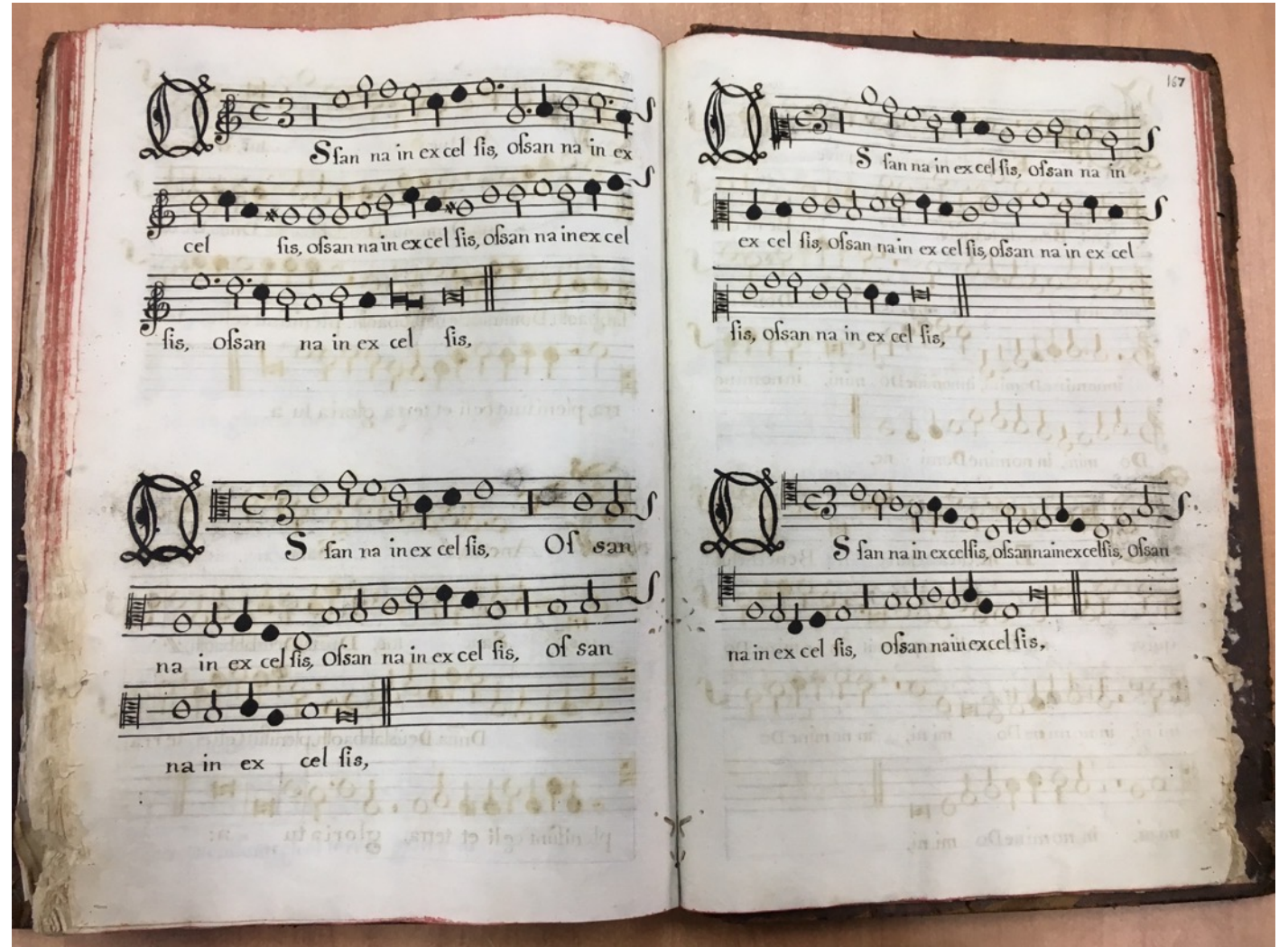
- Preservation and dissemination of the musical content of a set of colonial music manuscripts from Guatemala
- Using the tools developed at SIMSSA
 - Pixel.js
 - Calvo's method
 - Interactive Classifier (IC)
 - Pitch finding
 - Scoring-up tool



[Wikipedia: Central America](#)

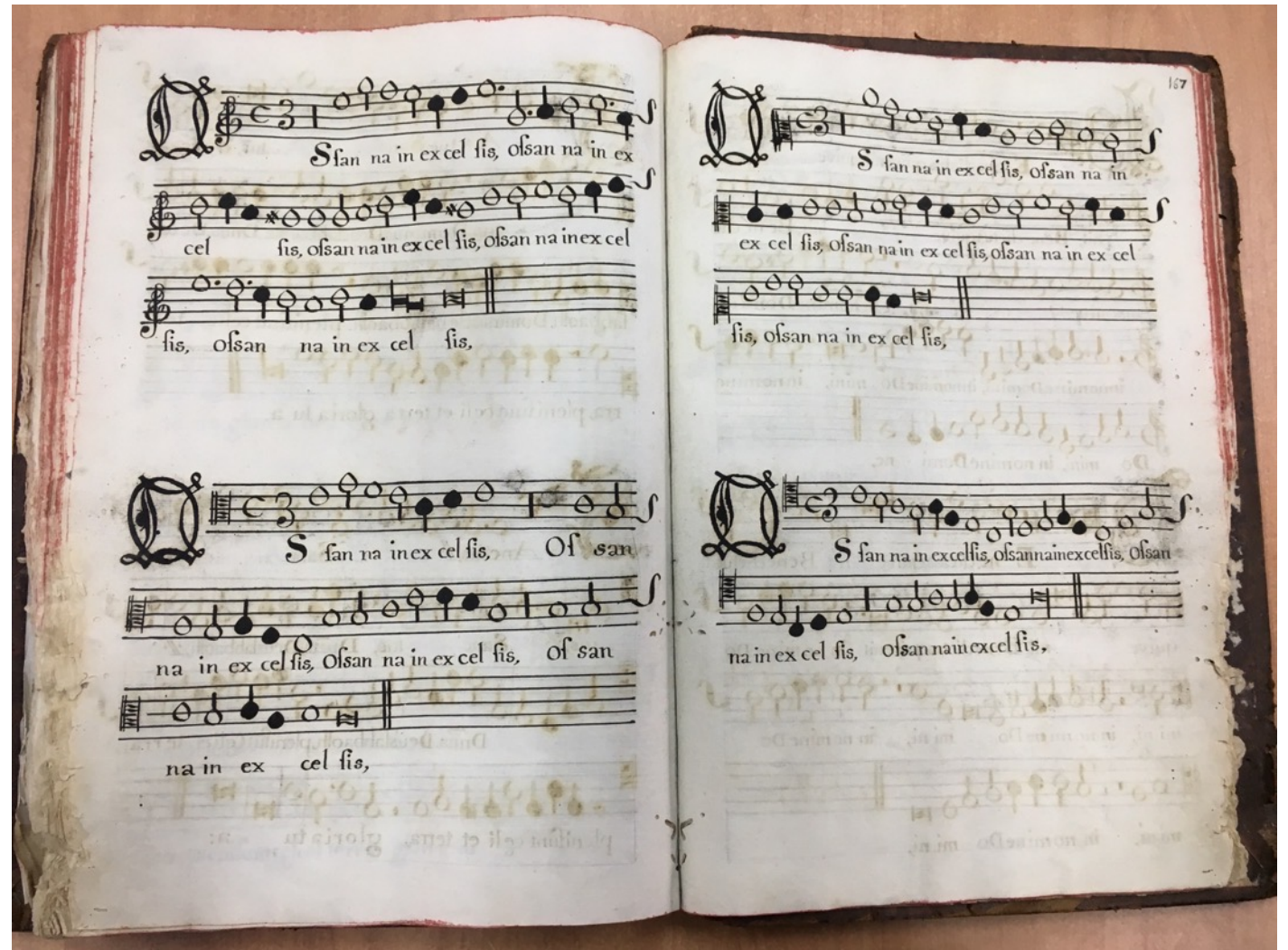
Guatemalan Choirbooks

- 6 manuscripts copied between XVI - XVIII
- Choirbook format
- Written in **mensural notation**
 - Music notation system used in Europe throughout the Late Middle Ages and the Renaissance



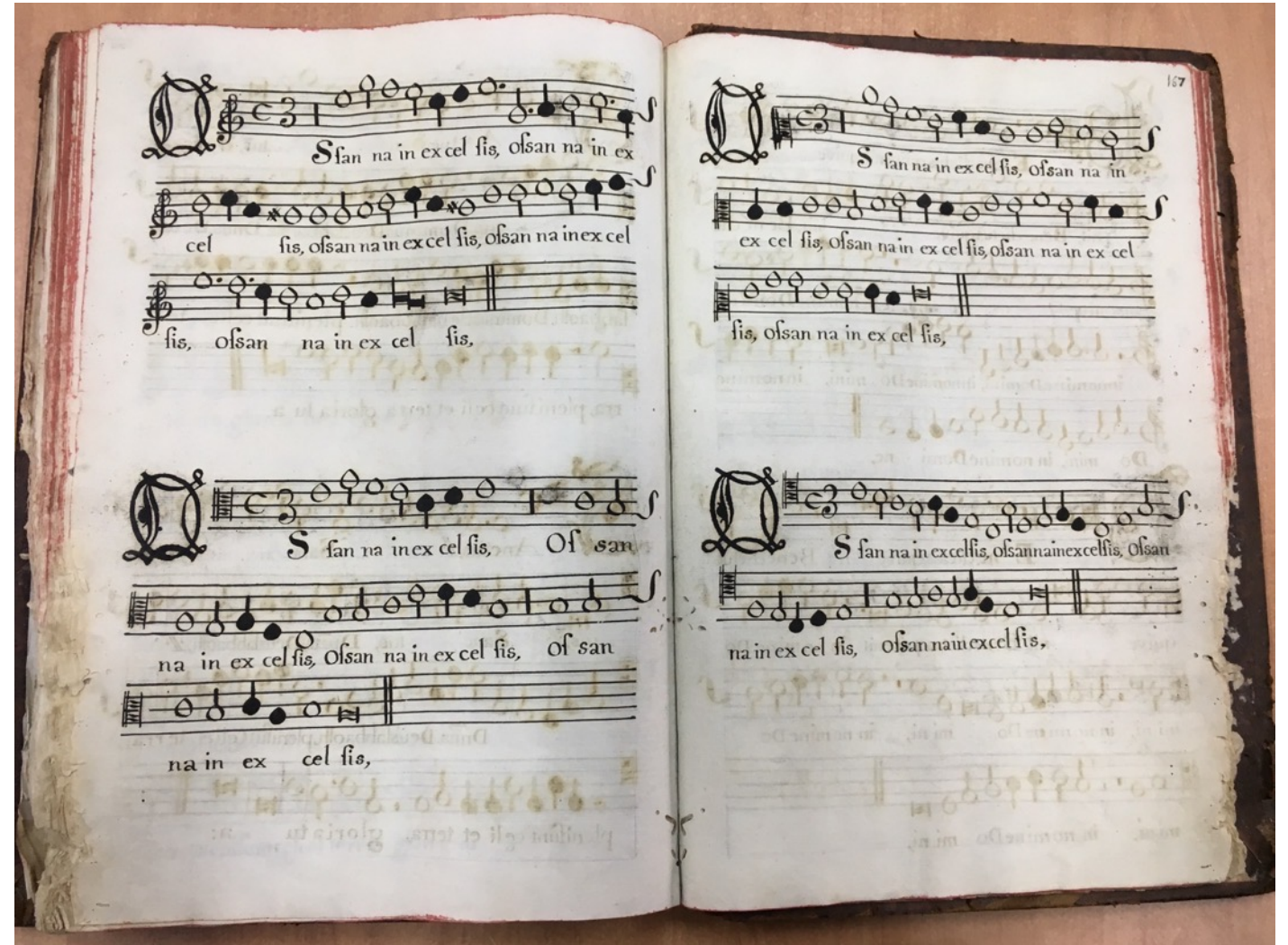
Barriers for Accessing the Music

- Lack of high-quality digital images
- Notation style (mensural notation)
- Layout (choirbook format)



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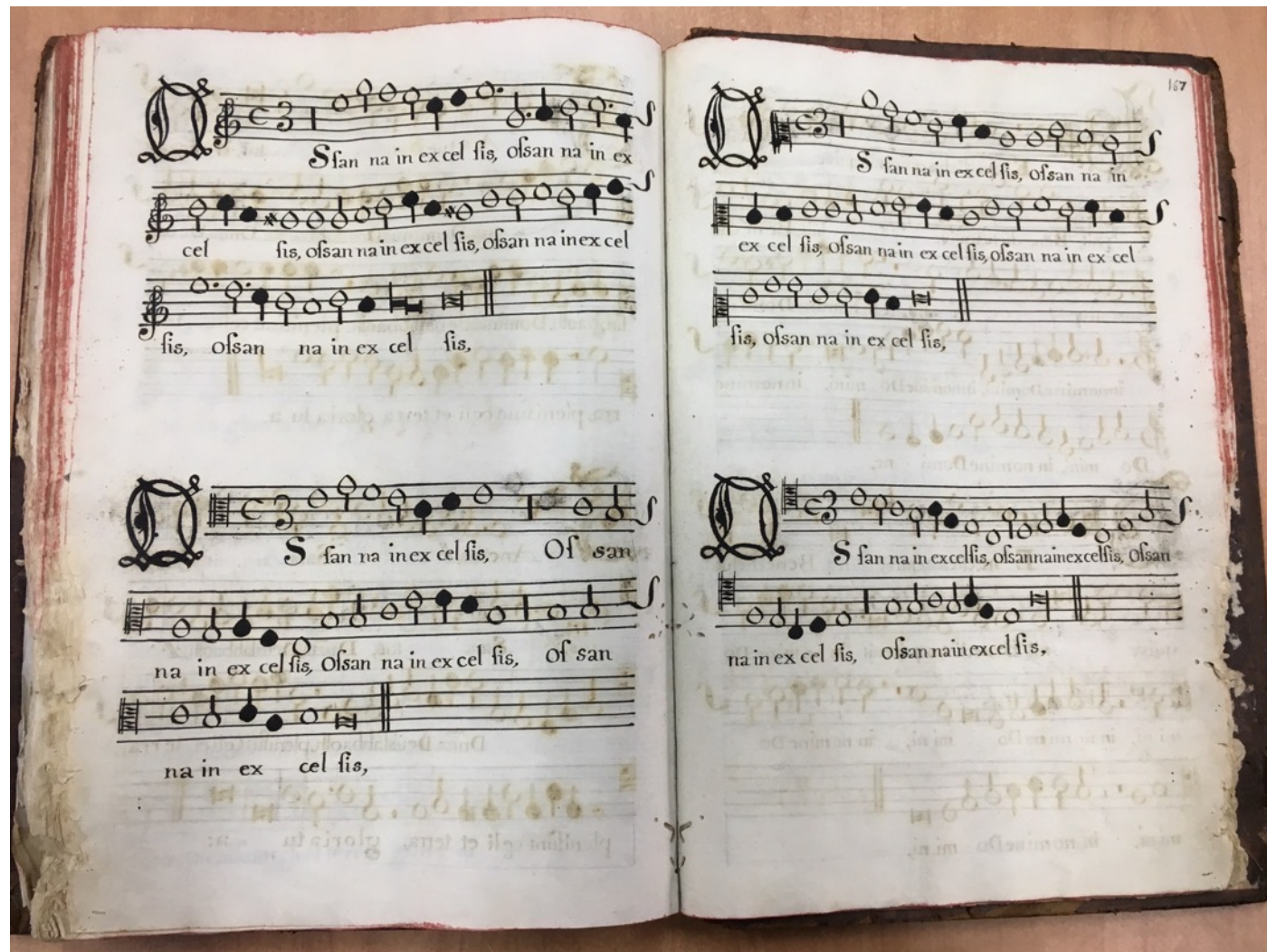


Deus voluntatis, laudamus
te, benedicimus te, glorificamus te
gratias agimus tibi domine deus rex celestis,
Deus pater omnipotens.

D
Deus voluntatis, laudamus te
benedicimus te, adoramus te, glorificamus
te, propter magnam gloriam tuam, Deus pater
omnipotens.

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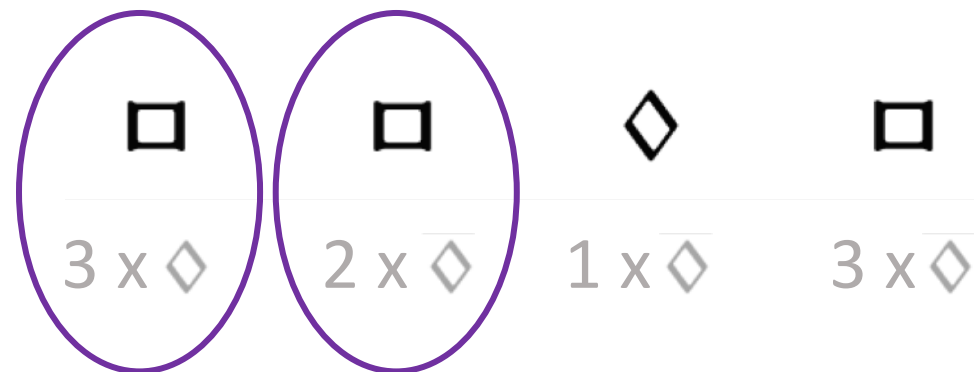


Mensural Notation

Notes		Values				
Name	Shape	Perfect (3)			Imperfect (2)	
Maxima	☐	☐	☐	☐	☐	☐
Long	☐	☐	☐	☐	☐	☐
Breve	◊	◊	◊	◊	◊	◊
Semibreve	◊	◊	◊	◊	◊	◊

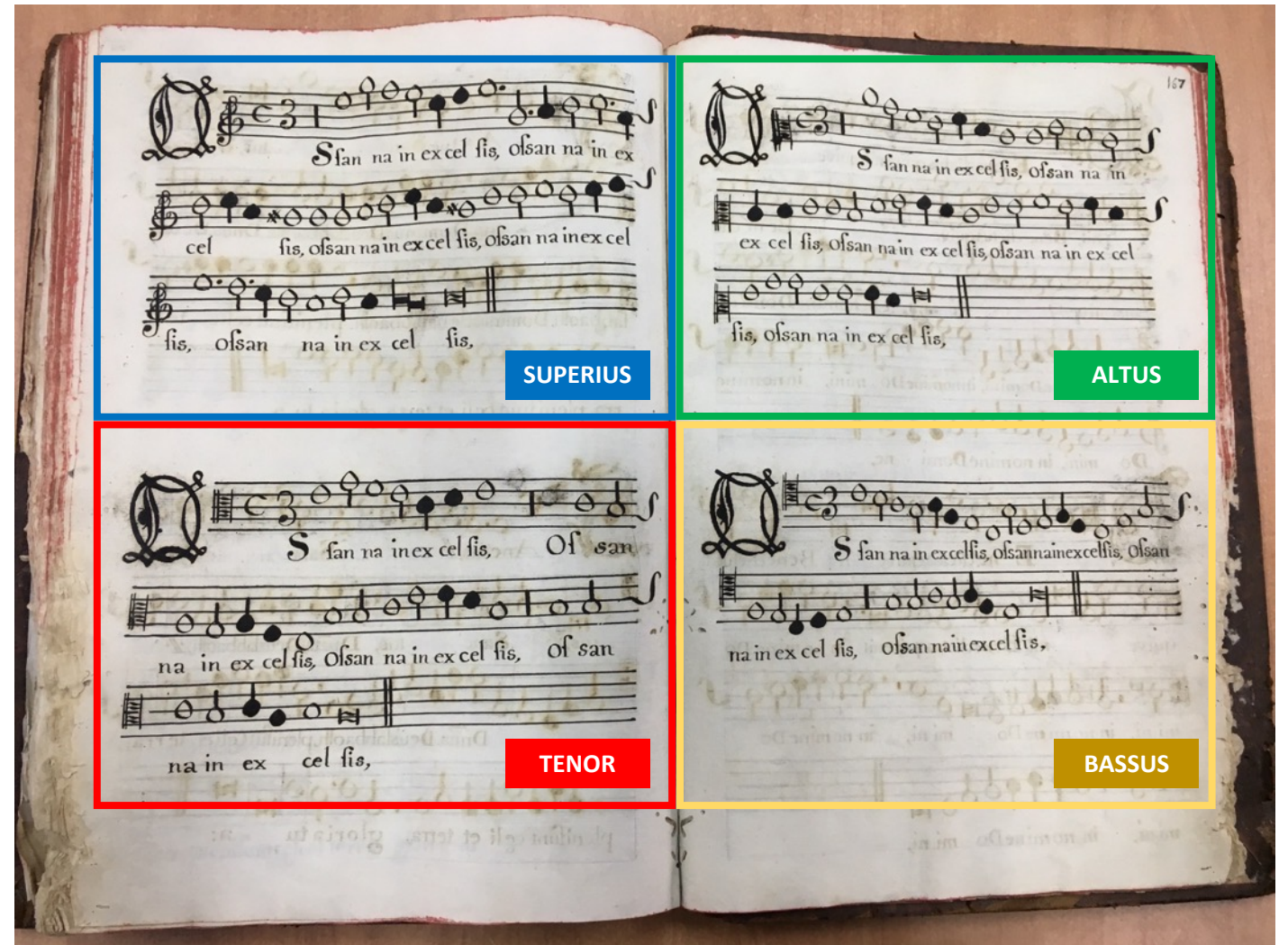
longest
 ↓
shortest

mensuration
context



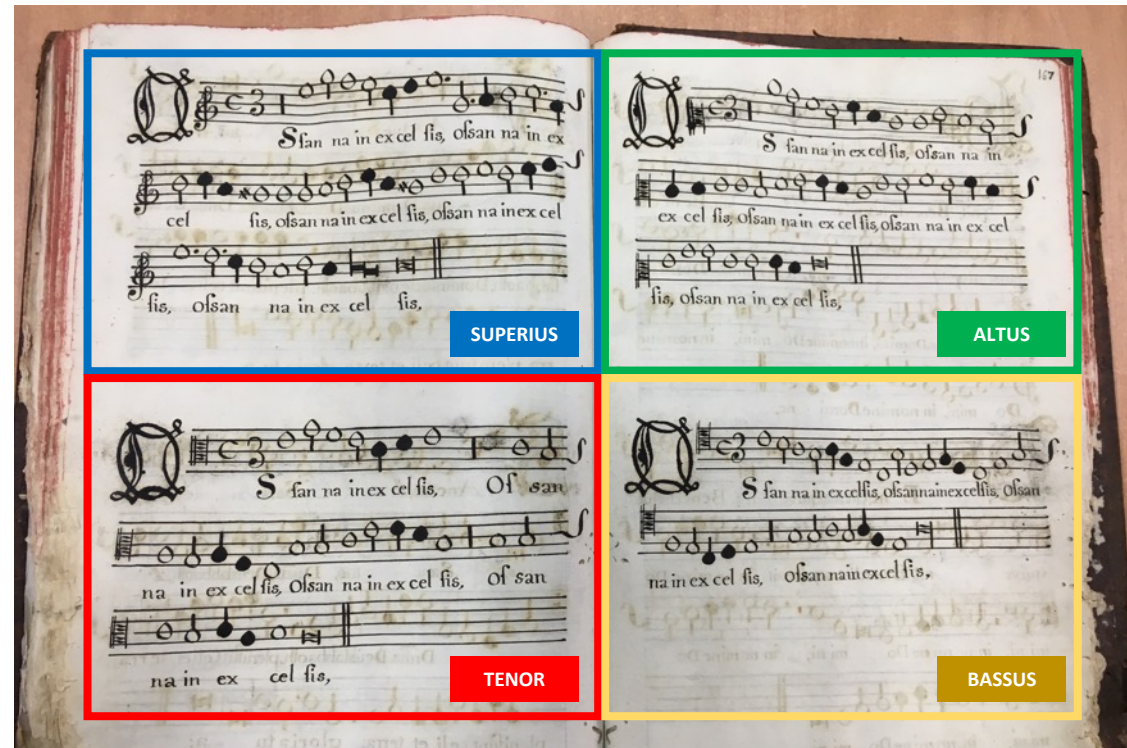
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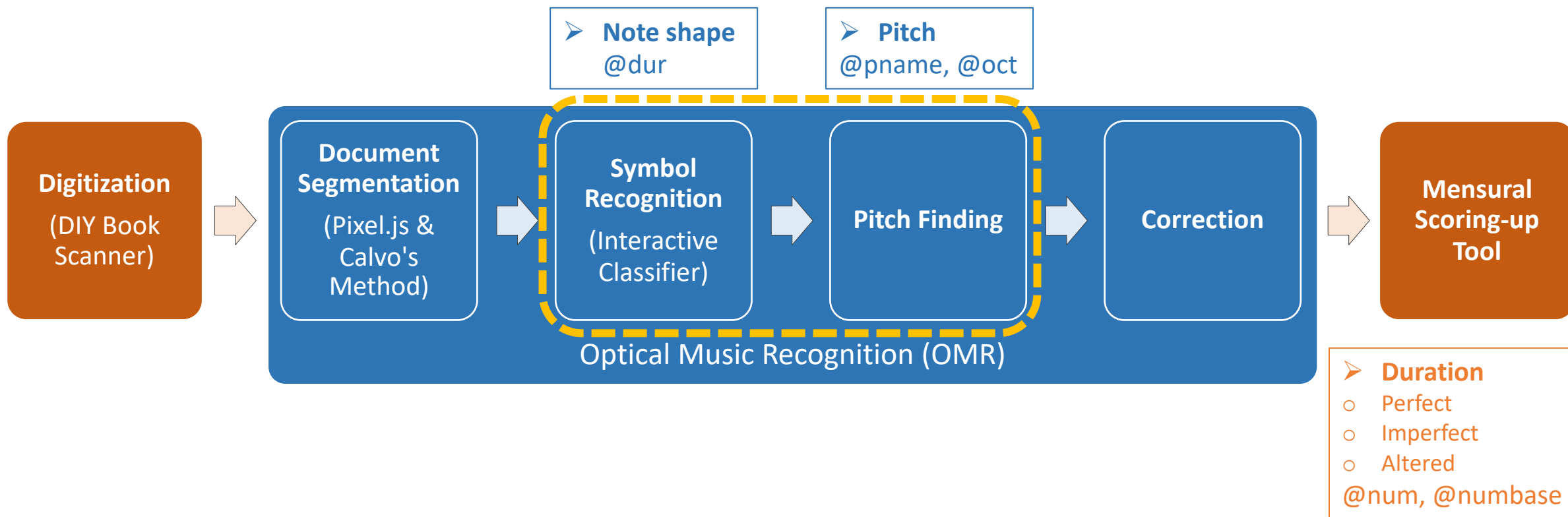
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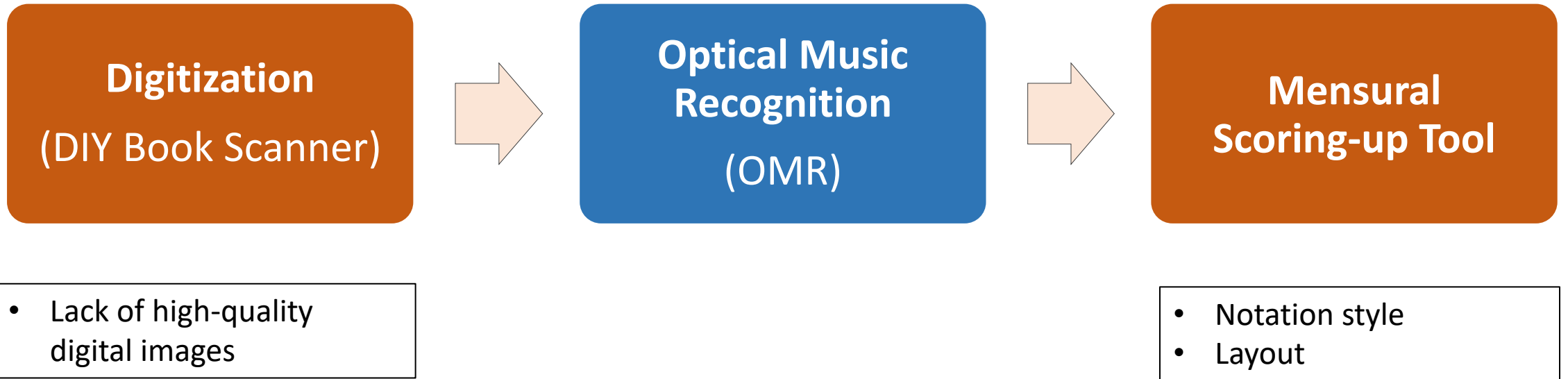


A digital score layout for the same piece, showing four staves labeled Superius, Altus, Tenor, and Bassus. The notation is modern, with diamond-shaped notes on a five-line staff. The lyrics are: "Os - san-na - in - ex - cel - sis". The layout is clean and clear, with a white background and colored highlights for each voice part.

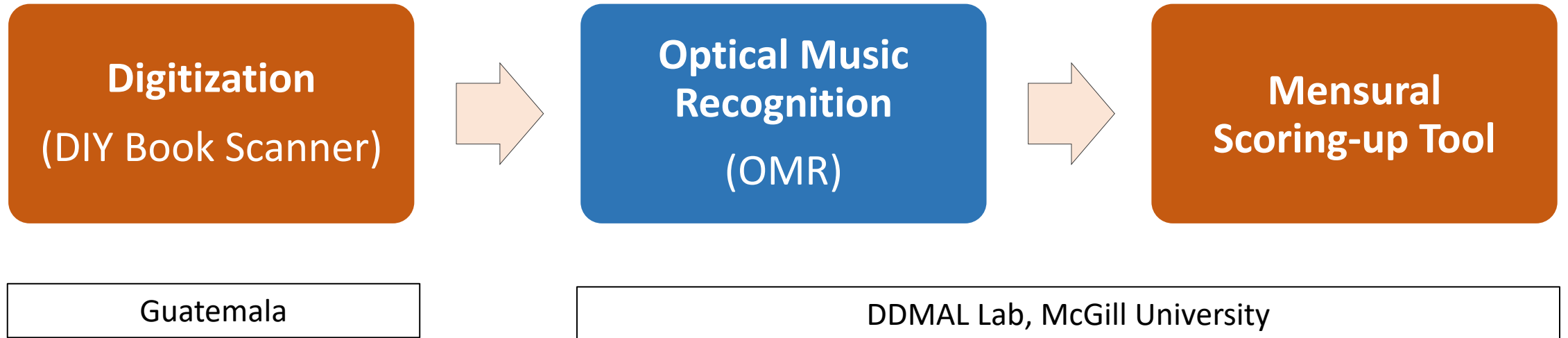
SIMSSA Tools



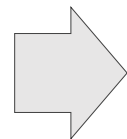
Three Stages of the Project



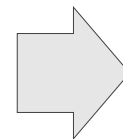
Three Stages of the Project



Digitization
(DIY Book
Scanner)



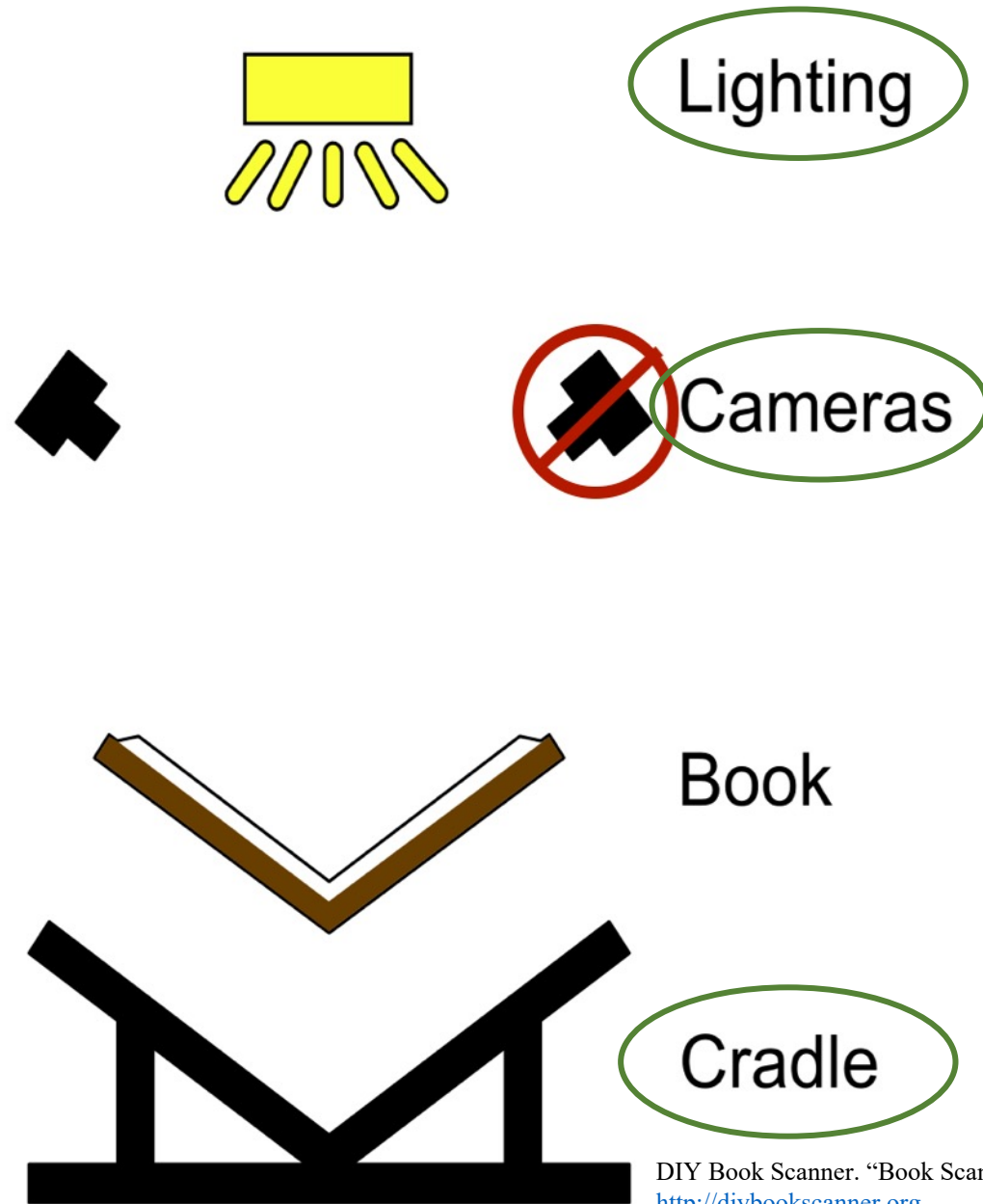
**Optical Music
Recognition**
(OMR)



**Mensural
Scoring-up
Tool**

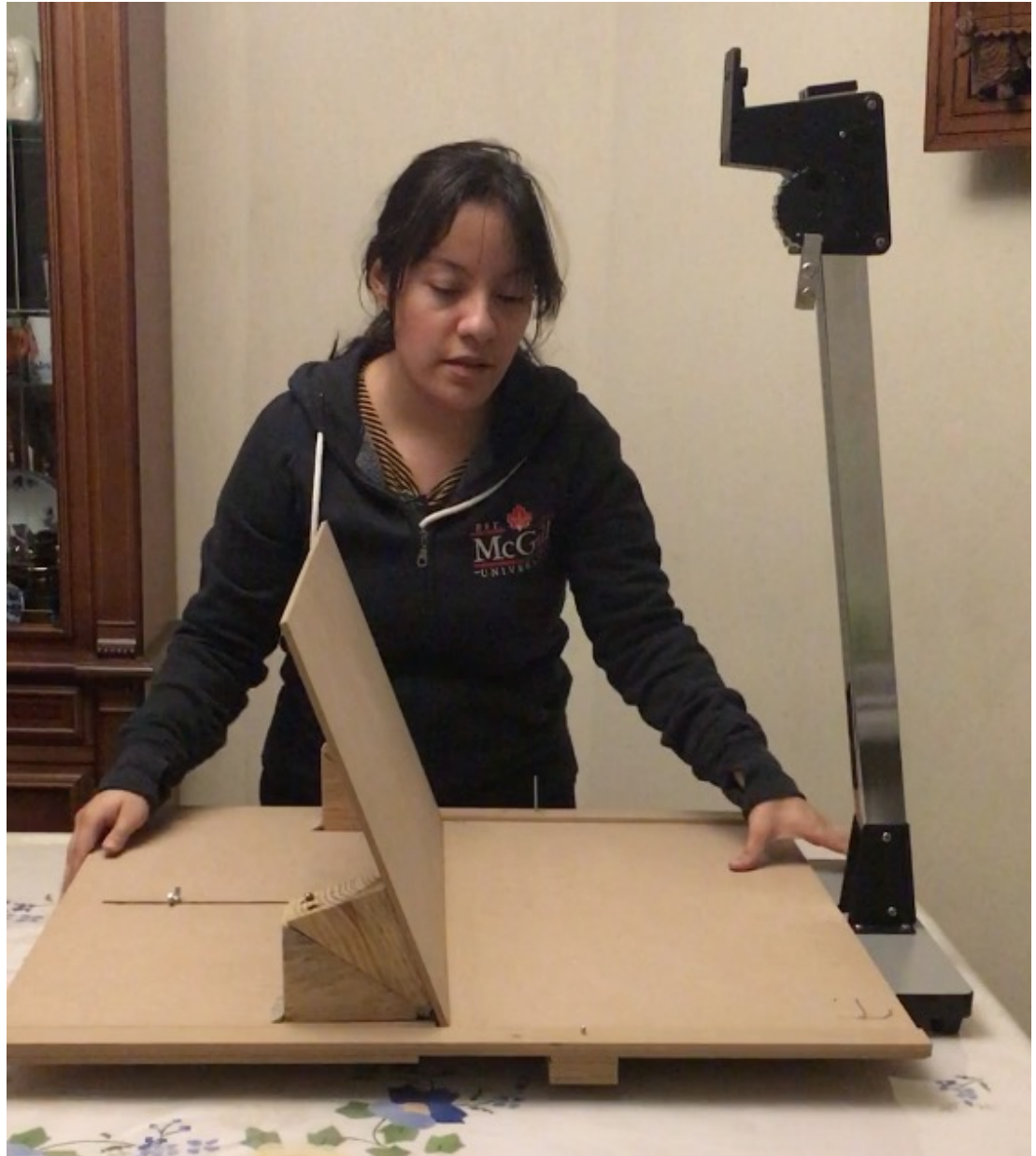
DIY Book Scanner

- V-shaped book cradle
 - Built
- Camera(s)
 - Borrowed from the McGill Music Library
 - Nikon D750 (24 Megapixels)
 - Images obtained have a 300 dpi resolution
- Lighting
 - Borrowed from DDMAL Lab, McGill University
 - Two natural-light LED panels



DIY Book Scanner. "Book Scanner Rigs."
<http://diybookscanner.org>

The V-Shaped Book Cradle & Copy Stand



DIY Book Scanner



Lighting



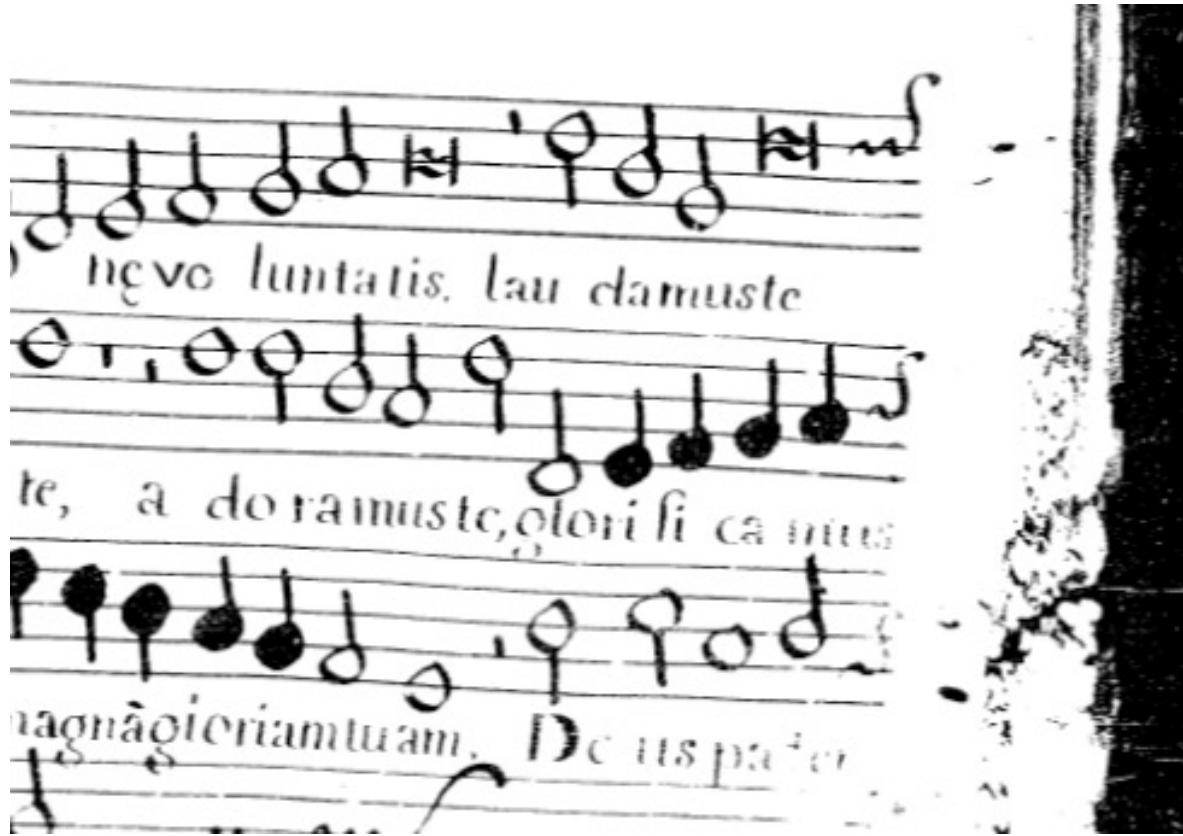
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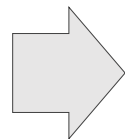
Comparison



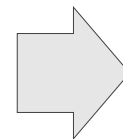
Comparison



Digitization
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**Optical Music
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(OMR)



**Mensural
Scoring-up
Tool**

- Pitch
- Note shape



OMR

Mensural
MEI file

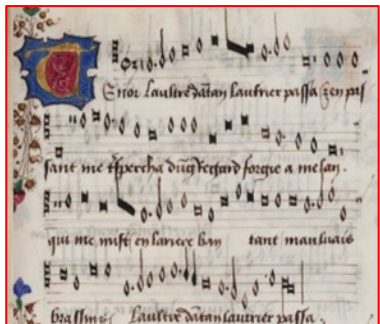
Superius part



OMR

Mensural
MEI file

Contratenor part



OMR

Mensural
MEI file

Tenor part

Scoring-up Tool

1. Duration based on context
2. Merge all files together

**Mensural
MEI file**

SCORE

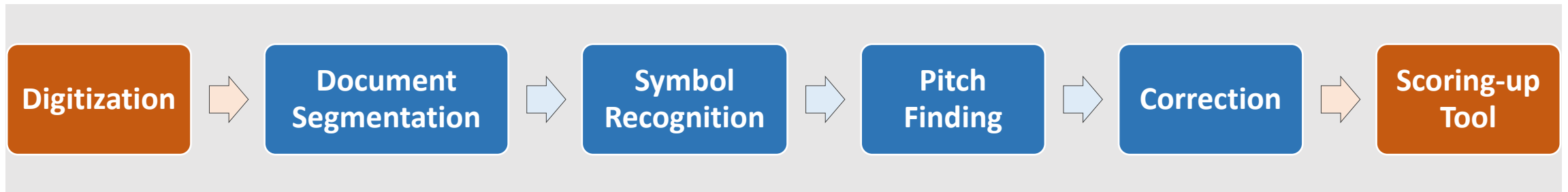
Verovio

Superius

Tenor

Contratenor

Expected Results



- Digitization and encoding of the repertoire as musical scores in a machine-readable file format
- Facilitate its preservation, dissemination, study by musicologists, and appreciation by the general public
- We expect this research to be used as a model for the digitization of the mensural repertoire of other countries that were once part of the colonial past

Thank you!

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SIMSSA | Single Interface for Music
Score Searching and Analysis

Verovio

MUSIC ENCODING
MEI
INITIATIVE

 Social Sciences and Humanities
Research Council of Canada

Conseil de recherches en
sciences humaines du Canada

Canada

 **McGill**

 Schulich School of Music
École de musique Schulich

DDMAL DISTRIBUTED DIGITAL MUSIC
ARCHIVES & LIBRARIES LAB

CIR Centre for Interdisciplinary Research
MMT in Music Media and Technology

Fonds de recherche
Société et culture
Québec