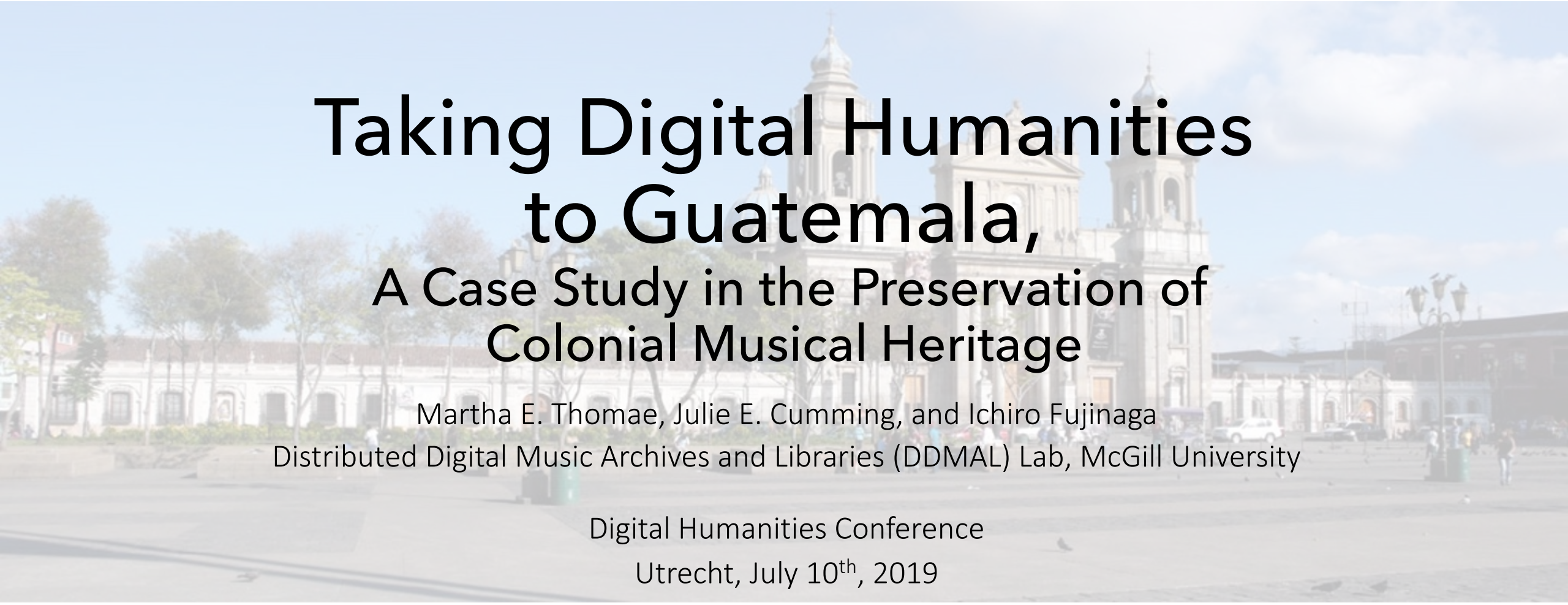


Taking Digital Humanities to Guatemala,

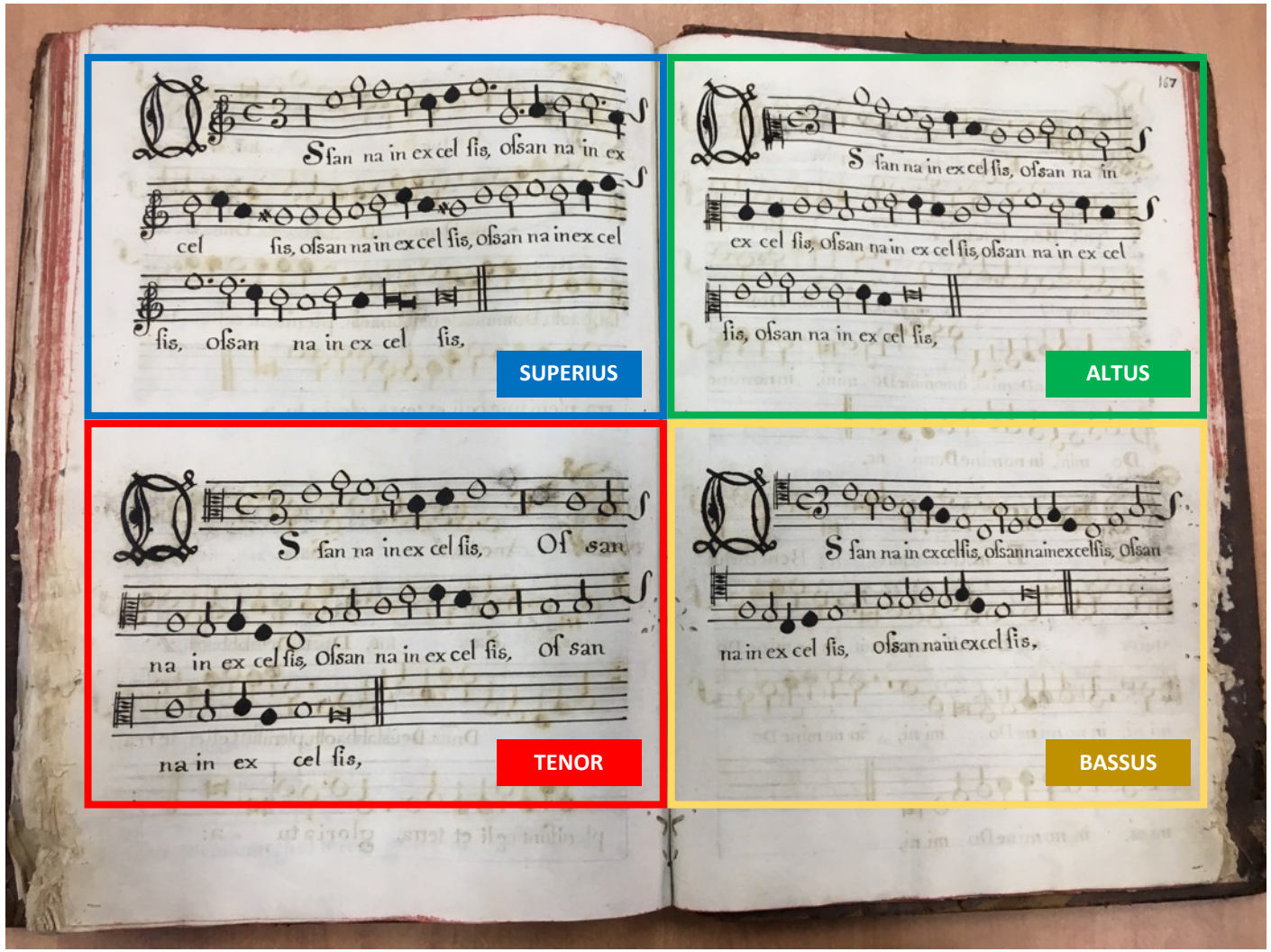
A Case Study in the Preservation of Colonial Musical Heritage

Martha E. Thomae, Julie E. Cumming, and Ichiro Fujinaga
Distributed Digital Music Archives and Libraries (DDMAL) Lab, McGill University

Digital Humanities Conference
Utrecht, July 10th, 2019

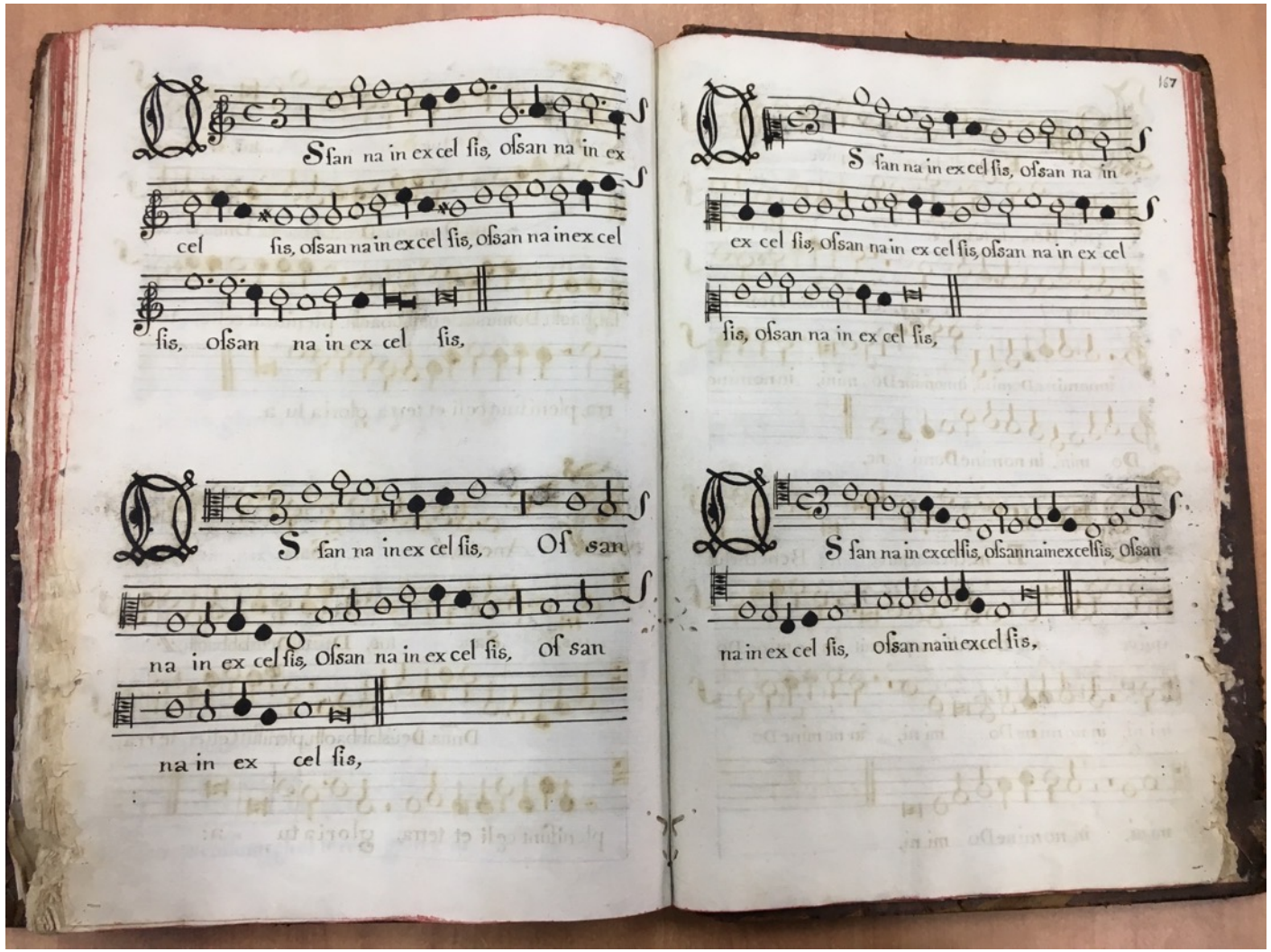
Guatemalan Choirbooks

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



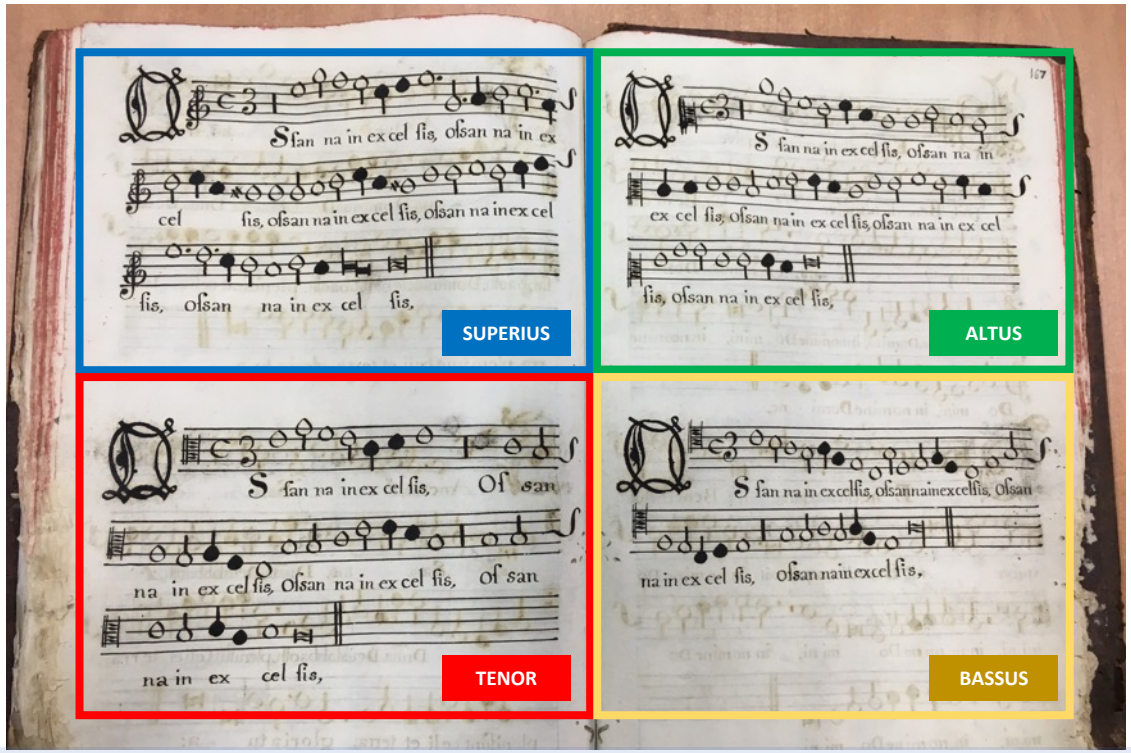
Barriers for Accessing the Music

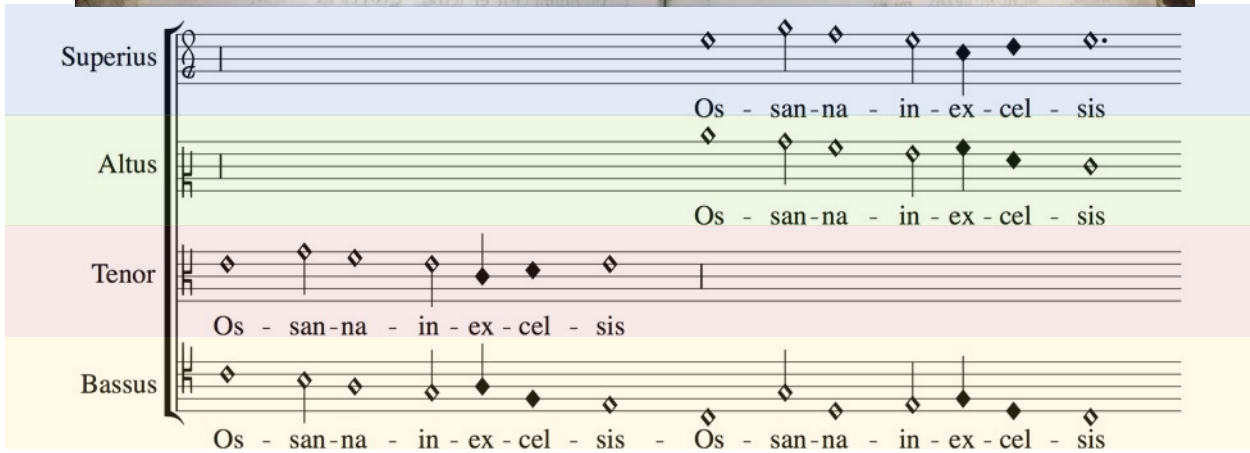
- Lack of high-quality digital images
- Notation style (mensural notation)
- Layout (choirbook format)



Barriers for Accessing the Music

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

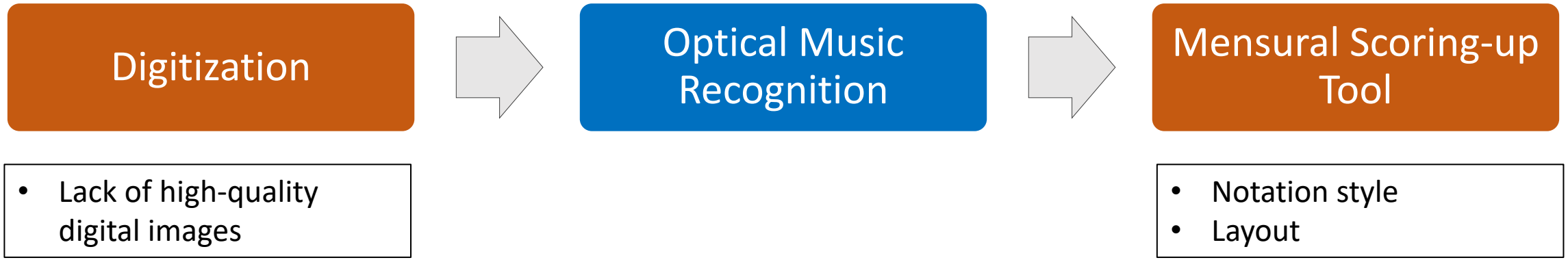




Process for Encoding the Music Content of the Choirbooks

Three stages:

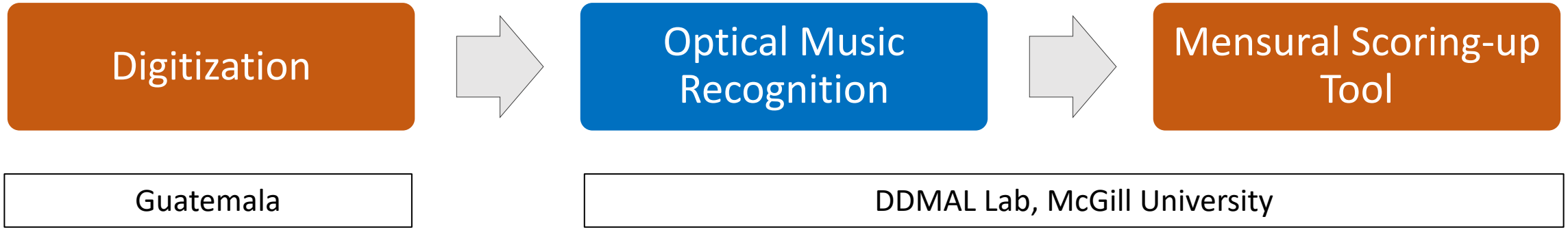
1. Digitization
2. OMR
   - Optical **Music** Recognition (O**M**R) ≈ Optical **Character** Recognition (O**C**R)
3. Tool designed for the music notation of these choirbooks

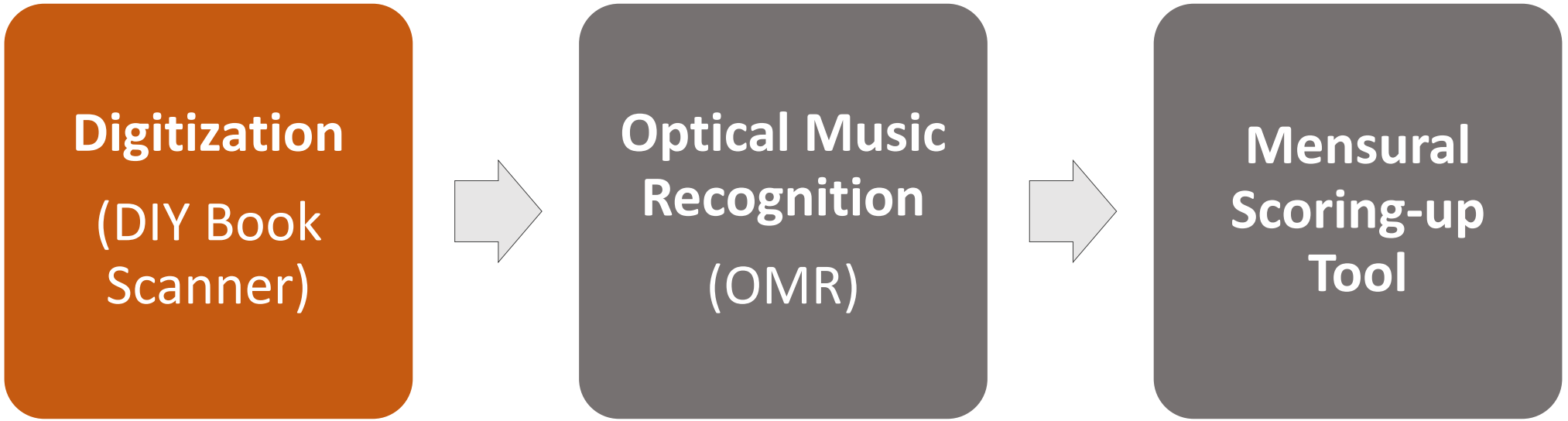


Process for Encoding the Music Content of the Choirbooks

Three stages:

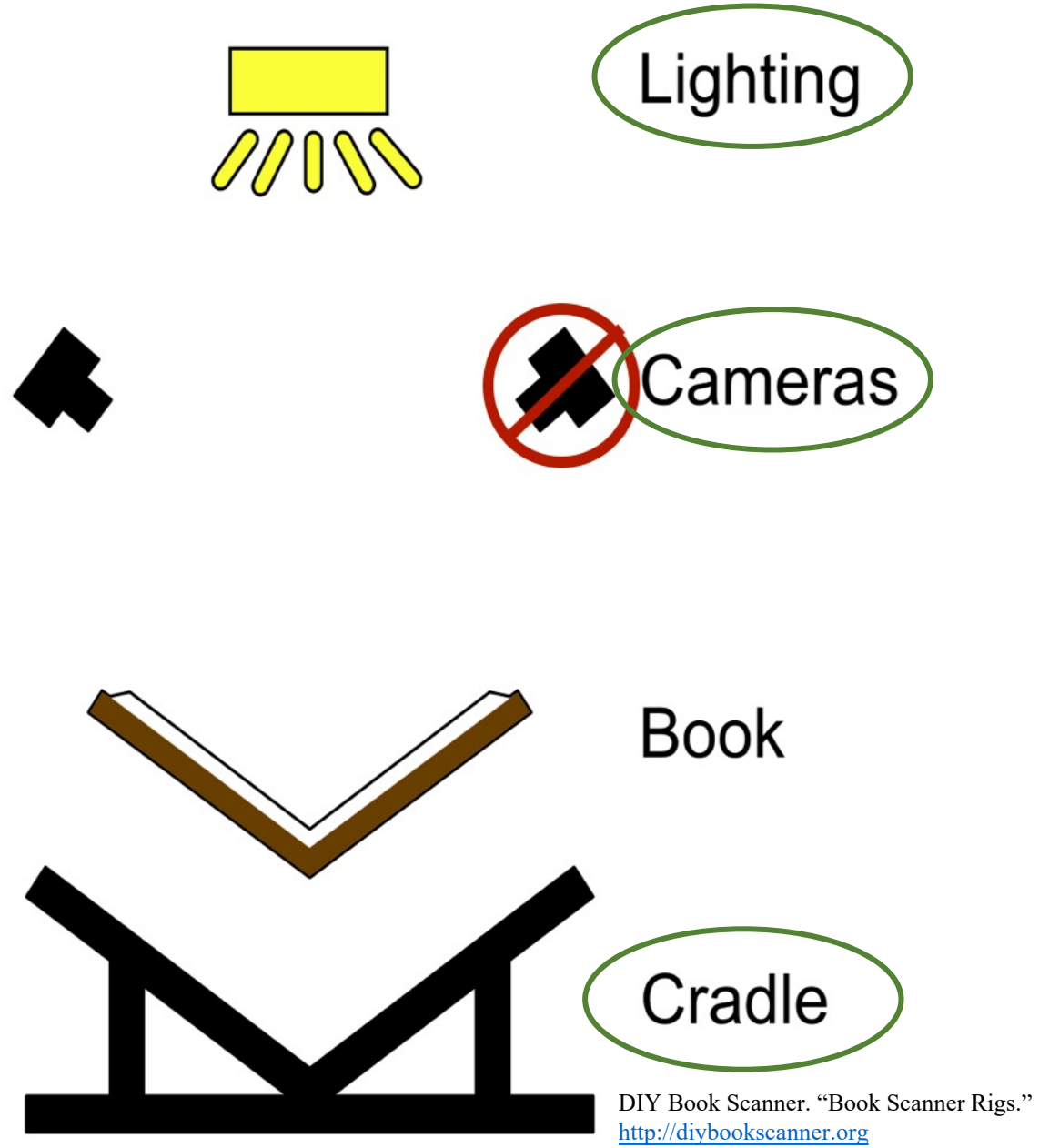
1. Digitization
2. OMR
   - Optical **Music** Recognition (O**M**R) ≈ Optical **Character** Recognition (O**C**R)
3. Tool designed for the music notation of these choirbooks




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
(with copy stand)

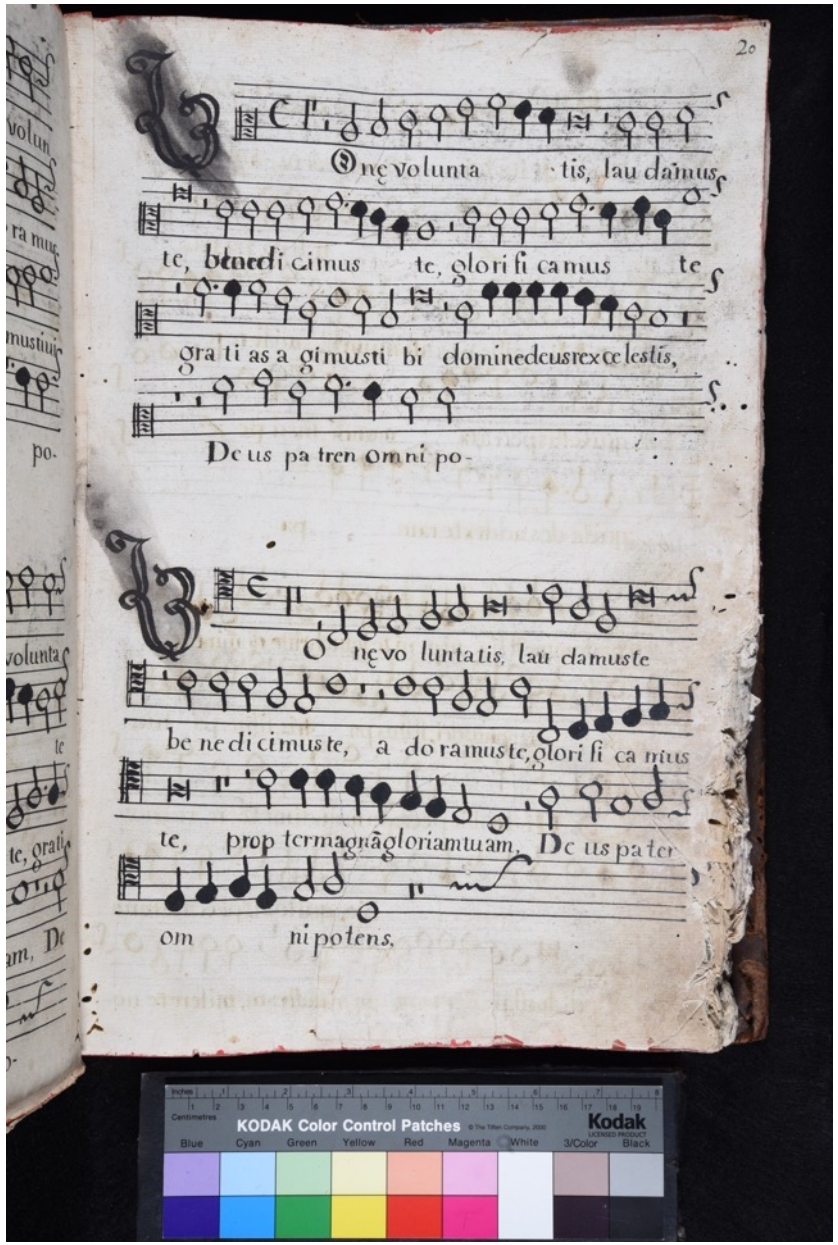
Cradle
& Camera

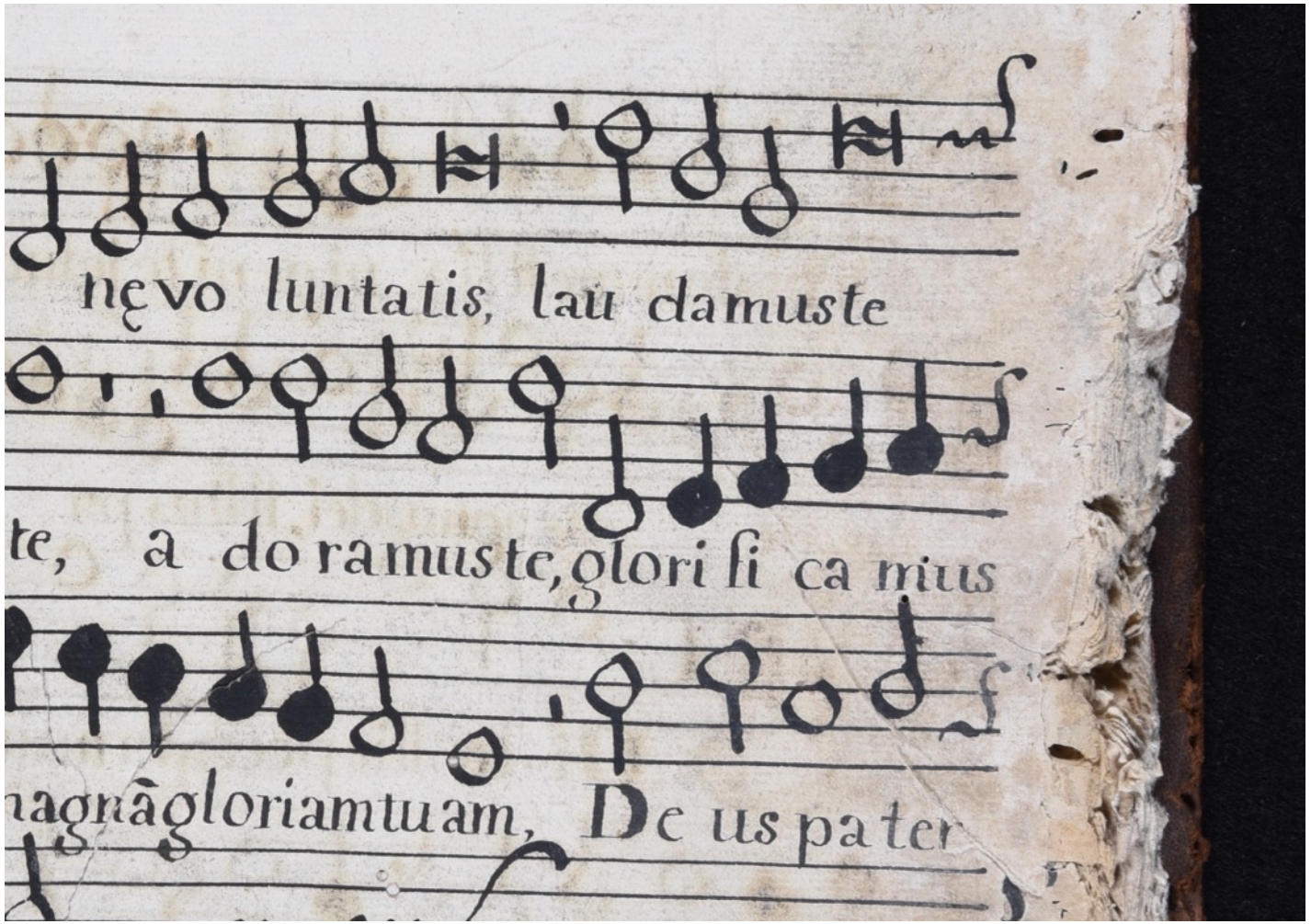
Lighting

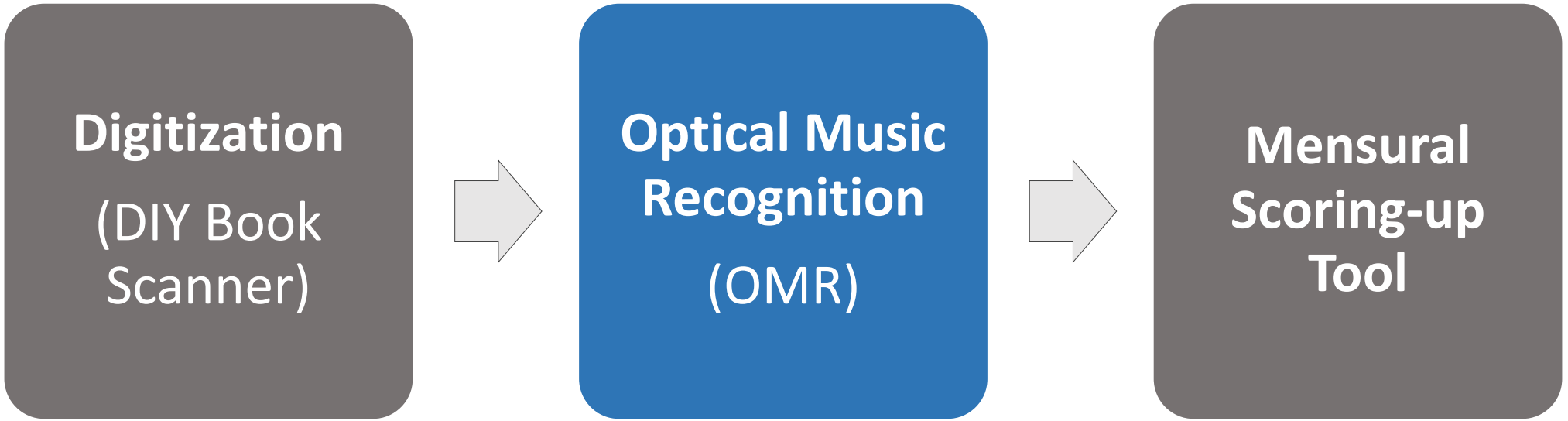
DIY Book Scanner

Advice from:

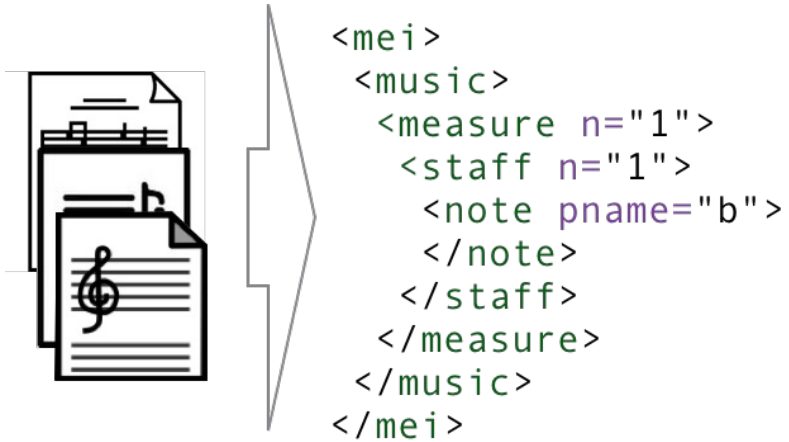
- Digital Image Archive of Medieval Music (DIAMM)
- Bibliothèque et Archives Nationales du Québec (BAnQ)
- McGill Library


20
O nę volunta tis, lau damus
te, benedi cimus te, glori fi camus te
gra ti as a gimusti bi dominedeusrexcelestis,
De us pa tren omni po-
O nęvo luntatis, lau damuste
be ne di cimus te, a do ramuste, glori fi ca mus
te, prop termagnāgloriamtuam, De us pater
om ni potens.
KODAK Color Control Patches
Kodak


nęvo luntatis, lau damuste
te, a do ramus te, glori fi ca mus
magnāgloriamtuam, De us pater


Digitization
(DIY Book Scanner)
Optical Music Recognition
(OMR)
Mensural Scoring-up Tool

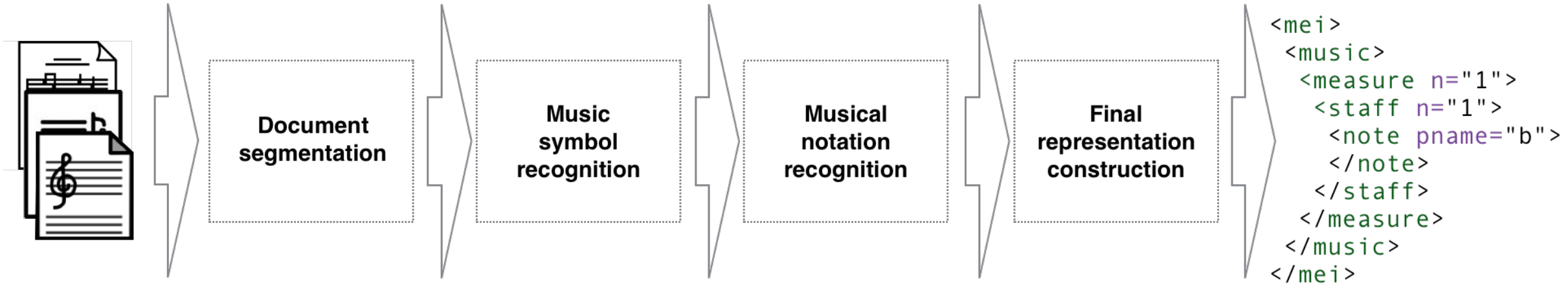
OMR Workflow



```
<mei>
 <music>
  <measure n="1">
   <staff n="1">
    <note pname="b">
    </note>
   </staff>
  </measure>
 </music>
</mei>
```

Vigliensoni, Gabriel, Jorge Calvo-Zaragoza, and Ichiro Fujinaga. "Developing an environment for teaching computers to read music." (2018).

OMR Workflow



Vigliensoni, Gabriel, Jorge Calvo-Zaragoza, and Ichiro Fujinaga. "Developing an environment for teaching computers to read music." (2018).

OMR Workflow

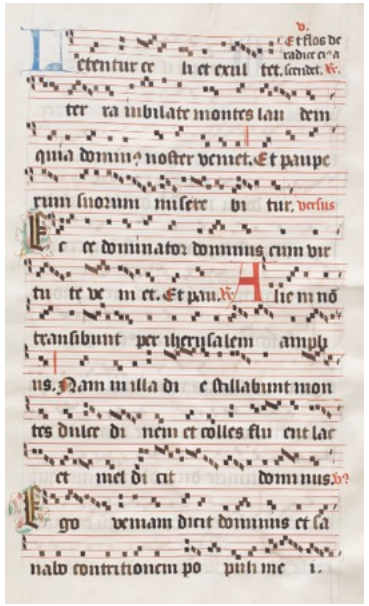
Document segmentation

Music symbol recognition

Musical notation recognition

Final representation construction

```
<mei>
 <music>
  <measure n="1">
   <staff n="1">
    <note pname="b">
    </note>
   </staff>
  </measure>
 </music>
</mei>
```



Vigliensoni, Gabriel, Jorge Calvo-Zaragoza, and Ichiro Fujinaga. "Developing an environment for teaching computers to read music." (2018).

OMR Workflow

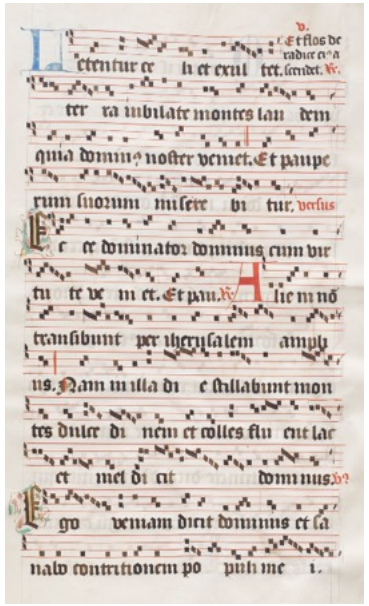
Document segmentation

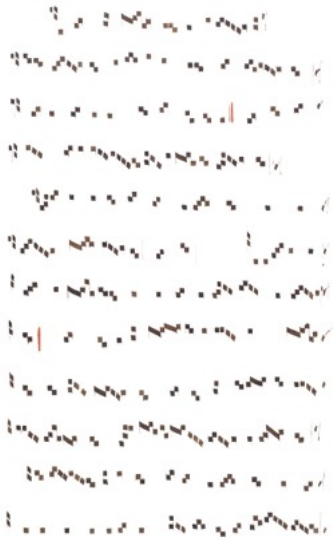
Music symbol recognition

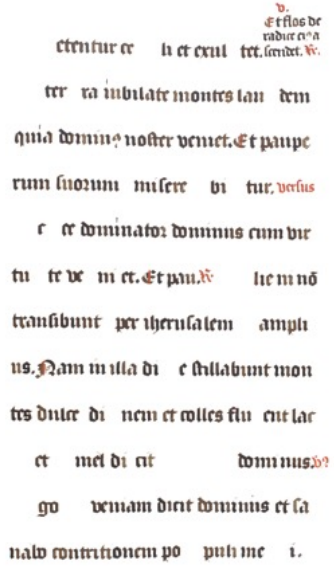
Musical notation recognition

Final representation construction

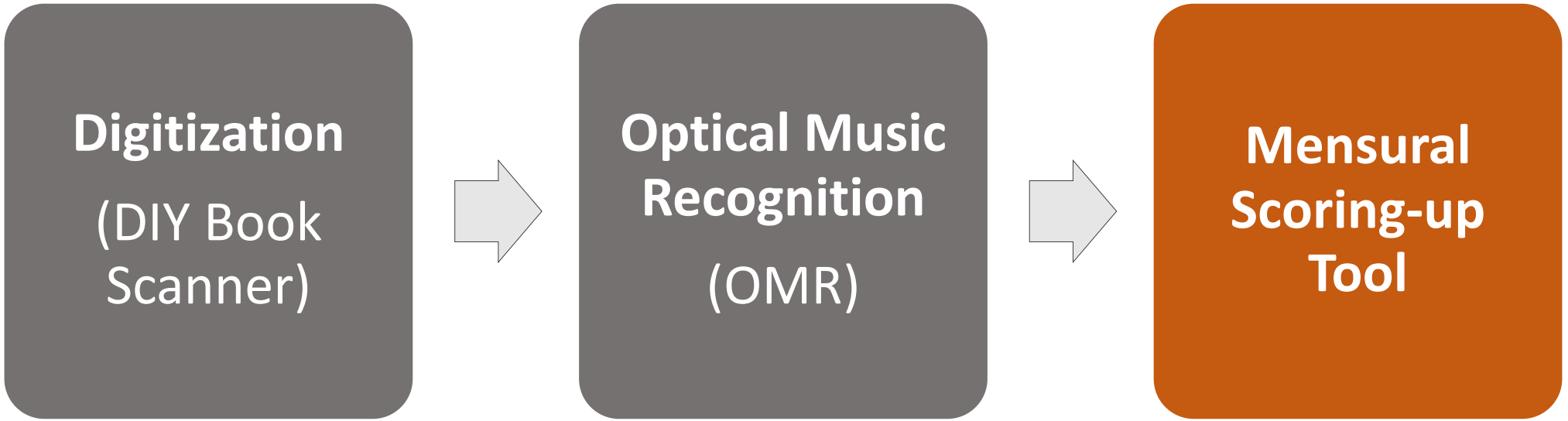
```
<mei>
 <music>
  <measure n="1">
   <staff n="1">
    <note pname="b">
    </note>
   </staff>
  </measure>
 </music>
</mei>
```



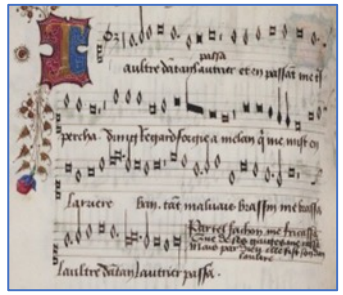




Vigliensoni, Gabriel, Jorge Calvo-Zaragoza, and Ichiro Fujinaga. "Developing an environment for teaching computers to read music." (2018).


Digitization
(DIY Book Scanner)
Optical Music Recognition
(OMR)
Mensural Scoring-up Tool

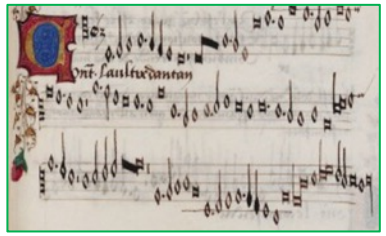
- Pitch
- Note shape



OMR

File 1

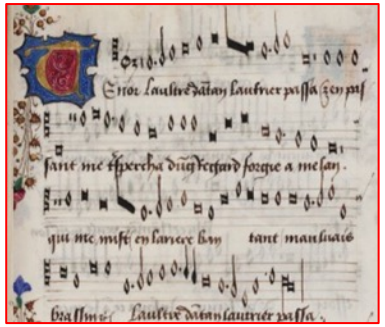
Superius part



OMR

File 2

Contratenor part



OMR

File 3

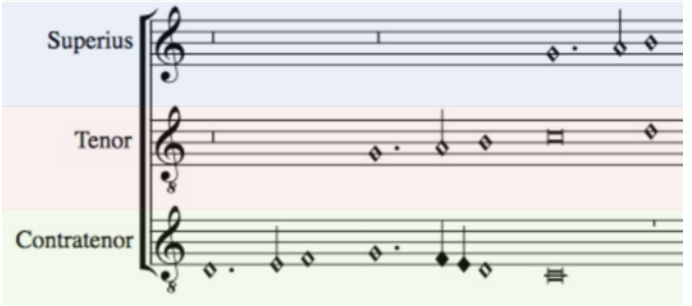
Tenor part

Scoring-up Tool

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

Output File

SCORE



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!

martha.thomaeelias@mail.mcgill.ca

Special thanks to: DIAMM, BAnQ, McGill Music Library

SIMSSA | Single Interface for Music Score Searching and Analysis

Verovio

Music Encoding Initiative MEI

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

CIRMMT Centre for Interdisciplinary Research in Music Media and Technology

Fonds de recherche Société et culture Québec