

SIMSSA | Single Interface for Music  
Score Searching and Analysis

# Workshop XVII

## Infrastructure for Music Discovery



Ichiro Fujinaga

Music Technology Area, Schulich School of Music  
McGill University

# SIMSSA

## Single Interface for Music Score Searching and Analysis

- ❖ Prototype for “Google scores” minus Google
  - ❖ OMR (optical music recognition) is required for full-text search
  - ❖ Sophisticated music analysis and query
- ❖ Access to digitized scores world-wide from a single website
- ❖ Funded by SSHRC/FRQSC/Mellon 2014–2021: \$4.2M

# What would SIMSSA provide?

- ❖ CONTENT: Web-based optical music recognition (OMR) system with score editors
  - ❖ Rodan (workflow management system)
    - ❖ Gamera + Aruspix (a combination of existing OMR software)
  - ❖ Verovio (open-source music engraver)
  - ❖ Early music
  - ❖ “Gradsourcing” to correct errors
- ❖ SEARCH & ANALYSIS: Web-based user interface to view, search, annotate, and analyze scores
  - ❖ MEI (Music Encoding Initiative)
  - ❖ Diva.js (web-based document delivery system)
  - ❖ Musiclibs (cross-depository music search engine)
  - ❖ SIMSSA DB (formerly ELVIS Database)
  - ❖ Humdrum / music21 / VIS / jSymbolic (analytical tools)

# SIMSSA Team: Musicologists (20)

- ❖ Jennifer Bain (Dalhousie)
- ❖ Inga Behrendt (Tübingen)
- ❖ Mauro Calcagno (Pennsylvania)
- ❖ Julia Craig-McFeely (Oxford)
- ❖ Julie Cumming (McGill)
- ❖ Elsa De Luca (Universidade Nova de Lisboa)
- ❖ Karen Desmond (Brandeis)
- ❖ Glen Ethier (Vanier College)
- ❖ Giuseppe Gerbino (Columbia)
- ❖ Kate Helsen (Western Ontario)
- ❖ Debra Lacoste (Waterloo)
- ❖ Sarah Long (Michigan State)
- ❖ Jesse Rodin (Stanford)
- ❖ René Rusch (U Michigan)
- ❖ Peter Schubert (McGill)
- ❖ Susan Forscher Weiss (Johns Hopkins)
- ❖ Frans Wiering (Utrecht)
- ❖ Jonathan Wild (McGill)

# SIMSSA Team: Librarians (9)

- ❖ Richard Chesser  
(British Library)
- ❖ Rachelle Chiasson-Taylor (Library and Archives Canada)
- ❖ Erin Conor  
(U of Washington)
- ❖ Barbara Dobbs Mackenzie (RILM)
- ❖ J. Stephen Downie  
(Illinois)
- ❖ Massimo Gentili-Tedeschi (RISM-Italy)
- ❖ Audrey Laplante  
(U de Montréal)
- ❖ Cynthia Leive (McGill)
- ❖ Perry Roland (Virginia)

# SIMSSA Team: Music Technologists (12)

- ❖ Jorge Calvo-Zaragoza (U Alicante)
- ❖ Michael Scott Cuthbert (MIT)
- ❖ Christoph Dalitz (Niederrhein U)
- ❖ Andrew Hankinson (Oxford)
- ❖ Johannes Kepper (U Paderborn)
- ❖ Jan Kolácek (Charles U, Prague)
- ❖ Cory McKay (Marianopolis College)
- ❖ Laurent Pugin (RISM)
- ❖ Craig Sapp (Stanford)
- ❖ Caroline Traube (U de Montréal)
- ❖ George Tzanetakis (U Victoria)
- ❖ Gabriel Vigliensoni (McGill)

# SIMSSA: Partners (23)

- ❖ Alexander Street Press
- ❖ Bavarian State Library
- ❖ Bibliothèque nationale de France
- ❖ British Library
- ❖ Compute Canada / Calcul Québec
- ❖ Dalhousie University
- ❖ DIAMM Centre for Studies in Early Music
- ❖ Harvard University Music Library
- ❖ Hathi Trust Research Center
- ❖ New York Philharmonic Archives
- ❖ Répertoire International de Littérature Musicale (RILM)
- ❖ RISM Switzerland
- ❖ State University of New York at Stony Brook
- ❖ The Juilliard School
- ❖ The Walters Art Museum
- ❖ Université de Montréal
- ❖ University of London, Goldsmith
- ❖ University of Pennsylvania Libraries
- ❖ University of Victoria
- ❖ University of Virginia
- ❖ University of Washington
- ❖ University of Waterloo

# SIMSSA: Advisory Board Members

- ❖ Douglas Eck (Google)
- ❖ David de Roure (Director, eResearch Centre, Oxford)
- ❖ Susan Vita (Head, Music Library, Library of Congress)

# SIMSSA Workshops (2011–)

- ❖ 2017/08/07: XII at CIRMMT (Montreal)
- ❖ 2017/09/22: XIII at Art Gallery of Nova Scotia (Halifax)
- ❖ 2018/05/28: XIV at CIRMMT (Montreal)
- ❖ 2018/07/28: XV at IAML (Leipzig)
- ❖ 2018/11/01: XVI at AMS/SMT (San Antonio)

# SIMSSA XII

## CIRMMT @Montreal (2017-08-07)



# SIMSSA XIII

## Art Gallery of Nova Scotia @Halifax (2017-09-22)



# SIMSSA XIV

## CIRMMT @Montreal (2018-05-28)



# SIMSSA XV

## IAML @Leipzig (2018-07-27)



# SIMSSA XVII

## AMS/SMT @San Antonio (2018/11/01)



# Achievements since July 2016

- ❖ Andrew Hankinson at Bodleian Library
- ❖ Karen Desmond at Brandeis University
- ❖ 3 PhD Dissertations
- ❖ 2 MA Theses
- ❖ 1 Book (Karen Desmond)
- ❖ 3 Book chapters
- ❖ 2 Journal articles
- ❖ 12 Conference Proceedings articles
- ❖ 89 Presentations
- ❖ Scoring-up project using Verovio completed (Martha Thomae)
- ❖ New neume schema for MEI 4.0 completed

# Other Accomplishments

- ❖ Four papers presented at ISMIR 2018 (September)
- ❖ Grant applications for “Mapping the Musical Landscape of the Sixteenth Century” (SSHRC, PI: Julie Cumming) submitted
- ❖ Grant applications for “Digital Analysis of Chant Transmission (DACT),” (SSHRC, PI: Jennifer Bain) submitted
- ❖ Conference papers submitted or in preparation:
  - ❖ New Directions in the Humanities Conference (2)
  - ❖ Digital Humanities Conference (2)
  - ❖ Music Encoding Conference (4)

# SIMSSA Team @McGill: Summer 2018



Claire Arthur

Noah Baxter

Laura Beauchamp

Julie Cumming

Nat Condit-Schultz

Alex Daigle

Tim de Reuse

Emily Hopkins

Yaolong Ju

Andrew Kam

Eric Liu

Zoé McLennan

Néstor Nápoles

Minh Anh Nguyen

Gustavo Pedro

Juliette Regimbal

Martha Thomae

Andrew Tran

Vi-An Tran

Gabriel Vigliensoni

# Acknowledgements

Christopher Antila  
Claire Arthur  
William Bain  
Ryan Bannon  
Laurier Baribeau  
Noah Baxter  
Laura Beauchamp  
Justin Bell  
Ruth Berkow  
Marina Borsodi-Benson  
John Ashley Burgoyne  
Greg Burlet  
Jorge Calvo-Zaragoza  
Remi Chiu  
Morgane Ciot  
Nat Condit-Schultz  
Julie Cumming  
Alex Daigle  
Marie DeYoung  
Tim de Reuse  
Natasha Dillabough  
Daniel Donnelly  
Neda Eshraghi  
Meredith Evans  
Wei Gao  
David Garfinkel

Mahtab Ghamsari  
Arielle Goldman  
Ryan Groves  
Jamie Klassen  
Peter Henderson  
Jason Hockman  
Emily Hopkinson  
Andrew Horwitz  
Yaolong Ju  
Andrew Kam  
Anton Khelou  
Jamie Klassen  
Reiner Krämer  
Véronique Lagacé  
Saining Li  
Eric Liu  
Wendy Liu  
Evan Magoni  
Zoé McLennan  
Nicky Mirfallah  
Lillio Mok  
Alexander Morgan  
Catherine Motuz  
Maria Murphy  
Néstor Nápoles  
Clare Neil

Minh Anh Nguyen  
Chris Niven  
Rory O'Connor  
Laura Osterlund  
Phyllis Ouyang  
Jérôme Parent-Lévesque  
Alexandre Parmentier  
Gustavo Pedro  
Sacha Perry-Fagant  
Alastair Porter  
Juliette Regimbal  
Deepanjan Roy  
Zeyad Saleh  
Harry Simmonds  
Brian Stern  
Tristano Tenaglia  
Martha Thomae  
Andrew Tran  
Vi-An Tran  
Gabriel Vigliensoni  
Tim Wilfong  
Mike Winters  
Ling-Xiao Yang  
Ké Zhang

# Acknowledgements



Social Sciences and Humanities  
Research Council of Canada

Conseil de recherches en  
sciences humaines du Canada

Canada



Schulich School of Music  
École de musique Schulich

C I R  
M M T   Centre for Interdisciplinary Research  
in Music Media and Technology



**Fonds de recherche  
Société et culture**

Québec



**compute** | **calcul**  
canada | canada

WEST GRID

## Schedule

- 10:00 – 10:15 – Ichiro Fujinaga: *Welcome & Introduction*
- 10:15 – 10:30 – Emily Hopkins: *Search as Access to Digital Music Libraries*
- 10:30 – 10:40 – Gabriel Vigliensoni: *Pixel.js*
- 10:40 – 10:50 – Minh Anh Nguyen: *Interactive Classifier*
- 10:50 – 11:00 – Noah Baxter: *Pitch Detection*
- 11:00 – 11:10 – Tim de Reuse: *Lyric Alignment*
- 11:10 – 11:20 – Zoé McLennan and Juliette Regimbal: *Neon2.js*
- 11:20 – 11:40 – **Coffee Break**
- 11:40 – 11:50 – Alex Daigle and Gabriel Vigliensoni: *Rodan*
- 11:50 – 12:00 – Néstor Nápoles: *Cantus Ultimus and CantusEditor*
- 12:00 – 12:10 – Andrew Kam: *IIIIF AV*
- 12:10 – 12:20 – Martha Thomae: *Guatemalan Manuscript Digitization Project*
- 12:20 – 13:30 – **Lunch (provided, please note any dietary restrictions in the comments section of the registration page)**
- 13:30 – 13:40 – Matan Gover: *MusicQuery*
- 13:40 – 13:50 – David Garfinkle: *PatternFinder*
- 13:50 – 14:00 – Eamonn Bell: *Designing incentives for crowdworker collection of a ground-truth dataset for use in score-image annotation tasks*
- 14:00 – 14:20 – Julie Cumming: *Revisiting the Origins of the Madrigal – With Machine Learning*
- 14:20 – 14:40 – Audrey Laplante: *Social barriers to digital scholarship for arts and humanities researchers*
- 14:40 – 15:00 – Jada Watson: *Discographic Metadata as a Research Resource for Studying the Development of Popular Music Genres and Cultures*
- 15:00 – 15:10 – **Coffee Break**
- 15:10 – 15:20 – Gustavo Polins Pedro and Yaolong Ju: *SIMSSA DB*
- 15:20 – 15:30 – Emily Hopkins: *SIMSSA DB Data Model*
- 15:30 – 15:40 – Ichiro Fujinaga: *Extending the SIMSSA DB Model*
- 15:40 – 16:00 – Open discussion: *Infrastructure for music discovery*



# The Vision: Global Music Library

Tools



Music Encoding Initiative

Humdrum

music21



Early Music Online

Music Treasures Consortium

Metadata & Text



Répertoire International de Littérature Musicale  
International Repository of Music Literature  
Internationales Repertorium der Musikliteratur