

Curriculum Vitae

Martha E. Thomae Elías

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San Vicente del Raspeig, Alicante, Spain

EDUCATION

2017–2022: McGill University, Montréal, Canada.

PhD in Music Technology. Dissertation: [“Guatemalan Cathedral Choirbooks: From Manuscript to Digital Images to Edited Symbolic Scores”](#) supervised by Prof. Ichiro Fujinaga and Prof. Julie E. Cumming. Research grant by *Fonds de Recherche du Québec – Société et Culture (FRQSC)*.

2015–2017: McGill University, Montréal, Canada.

M.A. in Music Technology. Thesis: [“Automatic Scoring Up of Mensural Music Using Perfect Mensurations, 1300–1550”](#) supervised by Prof. Ichiro Fujinaga and Prof. Julie E. Cumming. Nomination by McGill for *Northeastern Association for Graduate Schools (NAGS)* award.

2013: Universidad del Valle de Guatemala, Guatemala City, Guatemala.

B.S. in Mathematics. Undergraduate thesis: [“Desarrollo de un modelo algorítmico para la transformación de partituras musicales escritas en notación mensural blanca a notación contemporánea”](#) supervised by Lic. Luis Francisco Soto and Juan Pablo Pira.

2012: Universidad Francisco Marroquín, Guatemala City, Guatemala.

Diploma in Art History: Medieval and Islamic Art.

RESEARCH EXPERIENCE

A. ROLES

Nov 2023–Feb 2026 **Postdoctoral research fellow** for “Echoes from the Past: Unveiling a Lost Soundscape with Digital Analysis,” Research Project funded by the Fundação para a Ciência e a Tecnologia (FCT) of Portugal and led by Elsa De Luca, Centro de Estudos de Sociologia e Estética Musical (CESEM) and Faculdade de Ciências Sociais e Humanas at Universidade NOVA de Lisboa (NOVA FCSH). I am leading the development of a prototype tool for the analysis of chant melodies.

Feb–Nov 2023 **Postdoctoral research fellow** for the “LinkedMusic,” Research Project funded by the Social Sciences and Humanities Research Council (SSHRC) of Canada and led by Professor Ichiro Fujinaga, Distributed Digital Music Archives and Libraries (DDMAL) Lab, Department of Music Research, Schulich School of Music, McGill University.

2015–2022 **Research assistant** for the “Single Interface for Music Score Searching and Analysis” (SIMSSA) Research Project funded by the Social Sciences and Humanities Research Council (SSHRC) of Canada and led by Professors Ichiro Fujinaga, DDMAL Lab, and Julie Cumming, Musicology, Schulich School of Music, McGill University. **Lab Manager** September 2020 to December 2021. I supervised students, trained new lab members, directed lab meetings, tested

software for optical music recognition (OMR), prepared machine learning models for their use in OMR, tested data labelling strategies, prepared and reviewed documentation about the OMR process (see the [e2e-omr-documentation](#) GitHub repository), guided the OMR processing of medieval manuscripts (see the [e2e-omr-resources](#) GitHub repository), and worked on the development of a scoring-up algorithm for mensural notation (see the [scoring-up](#) GitHub repository).

2016, 2020–2022 **Consultant and developer** for “Measuring Polyphony,” a Research Project funded by the National Endowment for the Humanities (NEH) and led by Professor Karen Desmond, Brandeis University (now at Maynooth University). Developed the [Common Music Notation to Mensural MEI Translator](#) (2016) and the [automatic scoring-up functionality](#) of the [Measuring Polyphony Editor](#) (2020–21). Led the work on interoperability of the Measuring Polyphony Editor with the optical music recognition system *MuRET* (2021–2022), and the music analysis *humlib* library (2021–2022). Wrote the section of the [mens2kern](#) tool for translating mensural note durations, encoded in Humdrum `**mens`, to Common Music Notation note values, encoded in Humdrum `**kern` (2021).

B. PUBLICATIONS (refereed)

- Paper** Thomae, Martha E., David Rizo, Eliseo Fuentes-Martínez, Cristina Alís Raurich, Elsa De Luca, and Jorge Calvo-Zaragoza. "A Preliminary Proposal for a Systematic GABC Encoding of Gregorian Chant." In *Proceedings of the 11th International Conference of Digital Libraries for Musicology*, 45–53. Stellenbosch, South Africa: ACM, 2024. <https://doi.org/10.1145/3660570.3660581>
- Paper** Thomae, Martha E., Julie E. Cumming, and Ichiro Fujinaga. “Counterpoint Error-Detection Tools for Optical Music Recognition of Renaissance Polyphonic Music.” In *Proceedings of the 23rd International Society for Music Information Retrieval Conference*. Bengaluru, India, 2022. <https://archives.ismir.net/ismir2022/paper/000060.pdf>.
- Paper** Thomae, Martha E., Julie E. Cumming, and Ichiro Fujinaga. “Digitization of Choirbooks in Guatemala.” In *Proceedings of the 9th International Conference on Digital Libraries for Musicology*, 19–26. Prague, Czech Republic: ACM, 2022. <https://doi.org/10.1145/3543882.3543885>.
- Paper** Desmond, Karen, Laurent Pugin, Juliette Regimbal, David Rizo, Craig Sapp, and Martha E. Thomae. “Encoding Polyphony from Medieval Manuscripts Notated in Mensural Notation.” In *Proceedings of the Music Encoding Conference*, edited by Stefan Münnich and David Rizo, 197–219. Alicante, Spain (online): Humanities Commons, 2021. <https://doi.org/10.17613/tf2j-x697>.
- Chapter** Thomae, Martha E. “The Guatemalan Choirbooks: Facilitating Preservation, Performance, and Study of the Colonial Repertoire.” In *Christian Sacred Music in the Americas*, edited by Andrew Shenton and Joanna Smolko. New York, NY: Rowman & Littlefield, 2021.
- Poster** Desmond, Karen, Andrew Hankinson, Laurent Pugin, Juliette Regimbal, Craig Sapp, and Martha E. Thomae. “Next Steps for Measuring Polyphony: A Prototype Editor for Encoding Mensural Music.” In *Proceedings of the Music Encoding Conference*, 121–24. Tufts University, Boston, MA: Humanities Commons, 2020. <http://dx.doi.org/10.17613/5k88-9z02>.

- Paper** Thomae, Martha E., Antonio Ríos-Vila, Jorge Calvo-Zaragoza, David Rizo, and José M. Iñesta. “Retrieving Music Semantics from Optical Music Recognition by Machine Translation.” In *Proceedings of the Music Encoding Conference*, 19–24. Tufts University, Boston, MA: Humanities Commons, 2020. <http://dx.doi.org/10.17613/605z-nt78>.
- Paper** Thomae, Martha E., Julie E. Cumming, and Ichiro Fujinaga. “The Mensural Scoring-Up Tool.” In *Proceedings of the 6th International Workshop on Digital Libraries for Musicology*, 9–19. National Library of the Netherlands, The Hague, NL: ACM, 2019. <https://doi.org/10.1145/3358664.3358668>.

C. CONFERENCE PRESENTATIONS

- 2024 “Digital Images and Symbolic Encoding of Guatemalan Polyphonic Choirbooks: Enhancing Preservation and Access for Early Music Sources through Digitization and Music Information Retrieval.” **Keynote** presented at the 1st Latin American Music Information Retrieval (LAMIR) workshop, Rio de Janeiro, Brazil, 11 December.
- “Musicología computacional.” **Roundtable** led by **David Rizo Valero**, presented at the XI Congreso de la Sociedad Española de Musicología, Elche, Spain, 26 October. (*Refereed*)
- “Libros de polifonía de la Catedral Metropolitana de Guatemala, su digitalización y codificación como partituras.” Presented at the XI Congreso de la Sociedad Española de Musicología, Elche, Spain, 26 October. (*Refereed*)
- “Aplicación de tecnologías de digitalización y codificación para la preservación del patrimonio musical de Guatemala.” Presented at the Texts, Languages, and Communities – TEI 2024, Buenos Aires, Argentina, 10 October. (*Refereed*)
- "Digital Images and Symbolic Corpus of Sacred Polyphonic Music in Guatemala and their Retrieval Process." Presented at the Digital Technologies Applied to Music Research Conference: Methodologies, Projects and Challenges, Lisbon, Portugal, 28 June. (*Refereed*)
- "Enhancing Musicological Analysis through Digital Tools." Presented with Antoine Phan at the Digital Technologies Applied to Music Research Conference: Methodologies, Projects and Challenges, Lisbon, Portugal, 27 June. (*Refereed*)
- "Encoding and Analysis of Early Music: Aquitanian and Square Music Scripts." Presented at the Music Encoding Conference, University of North Texas, Denton, TX (online), 21 May. (*Refereed*)
- “De Pergaminho a Biblioteca Digital: O Cantochão de Braga e Guimarães como Estudo de Caso.” Presented with Elsa De Luca, Inês Nunes Trindade, and Francesco Orio at the 4º Encontro Nacional de Investigadores IN2PAST, Lisbon, Portugal, 1 February. (*Refereed*)
- 2023 “Updates and Outcomes from the Guatemalan Digitization and Encoding Project.” Presented at the Music Encoding and Text Encoding Initiative Joint Conference, Paderborn, Germany, 8 September. (*Refereed*)
- 2022 “Counterpoint Error-Detection Tools for Optical Music Recognition of Renaissance Polyphonic Music.” Presented at the International Society of Music Information Retrieval, Bengaluru, India, 6 December. (*Refereed*)

- “AMS-IAMSG Lightning Lounge – Cantorales: Spanish Chant Books in the Americas and Beyond.” Presented at the American Musicological Society / Society for Ethnomusicology / Society for Music Theory Joint Meeting, New Orleans, LA, 11 November. (*Refereed*)
- “Music Encoding for Research, Pedagogy, and Discovery – Guatemalan Cathedral Choirbooks: From Manuscripts to Digital Images to Symbolic Editorial Scores.” Presented at the American Musicological Society / Society for Ethnomusicology / Society for Music Theory Joint Meeting, New Orleans, LA, 11 November. (*Refereed*)
- “Guatemalan Cathedral Choirbooks: Automatic Transcription of Mensural Sources for Their Preservation, Access, and Study.” Presented at the International Musicological Society Congress, Athens, Greece, 24 August. (*Refereed*)
- “Digitization of Choirbooks in Guatemala.” Presented at the Digital Libraries for Musicology, Prague, Czech Republic, 27 July. (*Refereed*)
- “Accidental Discoveries.” Presented at the Digital Analysis of Chant Transmission (DACT) Workshop 7: Cantorales in the Americas and Beyond, Online, 11 March.
- 2021 “Encoding Polyphony from Medieval Manuscripts Notated in Mensural Notation.” Presented with Karen Desmond, Laurent Pugin, Juliette Regimbal, David Rizo, and Craig Sapp at the Music Encoding Conference, Alicante, Spain (online), 21 July. (*Refereed*)
- “Guatemalan Cathedral Choirbook 1: From Manuscript to Digital Images to Digital Scores.” Presented at the Medieval and Renaissance Music Conference, Lisbon, Portugal (online), 6 July. (*Refereed*)
- 2020 “Retrieving Music Semantics from Optical Music Recognition by Machine Translation.” Presented at the Music Encoding Conference, Tufts University, Boston, MA (online), 27 May. (*Refereed*)
- 2019 “The Mensural Scoring-up Tool.” Presented at the Digital Libraries for Musicology, National Library of The Netherlands, The Hague, The Netherlands, 9 November. (*Refereed*)
- “OMR for Mensural Notation: Looking at a Guatemalan Music Manuscript.” Presented at the SIMSSA Workshop XIX, CIRMMT, McGill University, Montréal, Québec, Canada, 21 September.
- “Taking Digital Humanities to Guatemala, a Case Study in the Preservation of Colonial Musical Heritage.” Presented at the Digital Humanities Conference, Tivoli Vredenburg, Utrecht, The Netherlands, 10 July. (*Refereed*)
- “Guatemalan Manuscripts: Digitization Issues and Future Challenges in the Adaption of the OMR Workflow for Mensural Music.” Presented at the SIMSSA Workshop XVIII, Department of Musicology, University of Vienna, Vienna, Austria, 2 June.
- “Application of Music-Encoding Technologies to Guatemalan Choirbooks, Facilitating Preservation and Musicological Studies of the Colonial Repertoire.” Presented at the Music Encoding Conference, University of Vienna, Vienna, Austria, 31 May. (*Refereed*)
- “Preservation of the Colonial Musical Heritage of Guatemala through Digitization and Music Encoding Technologies.” Presented at the Association of Canadian Archivists McGill Student Chapter’s annual colloquium: Archival Outreach & Hidden Collections, McLennan-Redpath Library Complex, McGill University, Montréal, Québec, Canada, 18 March. (*Refereed*)

- 2018 “Guatemalan Manuscript Digitization Project.” Presented at the SIMSSA Workshop XVII: Infrastructure for Music Discovery, CIRMMT, McGill University, Montréal, Québec, Canada, 1 December.
- “Automatic Scoring up of Parts in Mensural Notation.” Presented at the Medieval and Renaissance Music Conference, Maynooth University, Maynooth, Ireland, 6 July. (*Refereed*)
- “Automatic Scoring up of Music in Mensural Notation.” Presented at the Music Encoding Conference, Maryland University, College Park, Maryland, USA, 23 May. (*Refereed*)
- “Automatic Scoring up of Mensural Parts.” Presented at the Digital Musicology Workshop, CIRMMT, McGill University, Montréal, Québec, Canada, 27 April.
- 2017 “Automatic Scoring-up Tool for Mensural Music.” Presented at the SIMSSA Workshop XII, CIRMMT, McGill University, Montréal, Québec, Canada, 7 August.
- “A Methodology for Encoding Mensural Music: Introducing the Mensural MEI Translator.” Invited talk at the Music Technology Group, Universitat Pompeu Fabra, Barcelona, Spain, 22 May.
- “A Methodology for Encoding Mensural Music: Introducing the Mensural MEI Translator.” Presented at the Music Encoding Conference, Université de Tours, Tours, France, 17 May. (*Refereed*)
- 2016 “Digital Encoding of Mensural Music.” Presented at the SIMSSA Workshop X, CIRMMT, McGill University, Montréal, Québec, Canada, 24 September.

TEACHING EXPERIENCE

A. COURSES

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| Fall 2020 | Co-lecturer, “MUMT 301: Music & the Internet.” McGill University. |
| Fall 2018 | Teaching Assistant, “MUMT 306: Music & Audio Computing I.” McGill University. |
| Winter 2018 | Teaching Assistant, “MUAR 211: The Art of Listening.” McGill University. |
| Fall 2017 | Teaching Assistant, “MUMT 202: Fundamentals of New Media.” McGill University. |
| First term, 2014 | Teaching Assistant, “Mathematical Models 1.” Universidad del Valle de Guatemala. |
| First term, 2011 | Grader, “Complementary Subjects in Mathematics” (basic contents: partial differential equations and complex functions). Universidad del Valle de Guatemala. |
| First term, 2009 | Grader, “Linear Algebra 1” and “Physics 2.” Universidad del Valle de Guatemala. |
| | Teaching Assistant, “Physics 2 – Laboratory.” Universidad del Valle de Guatemala. |
| Second term, 2008 | Grader, “Physics 1.” Universidad del Valle de Guatemala. |

B. WORKSHOPS AND LECTURES

- 2024 “Introducción a la codificación de música utilizando el formato de la Music Encoding Initiative (MEI).” Workshop presented at the Texts, Languages, and Communities – TEI 2024, Buenos Aires, Argentina, 07 October. (*Refereed*)
- “Workshop: Encoding Neumes with MEI.” Workshop presented with Elsa De Luca at the Medieval and Renaissance Music Conference, Universidad de Granada, Spain, 06 July. (*Refereed*)
- "MEI Encoding of Early Music. The Neumes Module." Invited lecture presented with Elsa De Luca at the Research Seminar Series “Musicologists and Their Sources: The Alchemy of Turning Parchment into Pixels” (being part of the COST Action Early Muse), Universidade NOVA de Lisboa, Lisbon, Portugal, 25 June.
- "Music Retrieval Tools (OMR and Music Analysis)." Invited lecture presented with Antoine Phan and Elsa De Luca at the Research Seminar Series “Musicologists and Their Sources: The Alchemy of Turning Parchment into Pixels” (being part of the COST Action Early Muse), Universidade NOVA de Lisboa, Lisbon, Portugal, 24 June.
- "From Manuscript to Pixel. Tips for a Digitizing Campaign and for Handling Endangered Sources." Invited lecture presented with Zuelma Chaves and Carla Crespo at the Research Seminar Series “Musicologists and Their Sources: The Alchemy of Turning Parchment into Pixels” (being part of the COST Action Early Muse), Universidade NOVA de Lisboa, Lisbon, Portugal, 22 June.
- “Codificación y publicación de música: Un taller sobre la Music Encoding Initiative (MEI).” Workshop presented at the Semana de Humanidades Digitales, Buenos Aires, Argentina (online), 24 May. (*Refereed*)
- “Cantorales in the Americas & Beyond.” Invited lecture presented with Virginia Blanton at the Centro de Estudos de Sociologia e Estética Musical (CESEM), Universidade NOVA de Lisboa, Lisbon, Portugal, 14 February.
- 2023 “MIR for Early Music Documents: Technologies behind the Semi-Automatic Encoding of Mensural Sources into Symbolic Scores.” Invited lecture presented at the Computational and Digital Approaches to Music Scholarship, University of Würzburg, 13 December.
- “MEI-Workshop: Mensural Music.” Workshop presented with Anna Plaksin at the Medieval and Renaissance Music Conference, Munich, Germany, 25 July. (*Refereed*)
- “Codificación y publicación de música: Un taller sobre Music Encoding Initiative (MEI).” Workshop presented at the Semana de Humanidades Digitales, Online, 12 May. (*Refereed*)
- 2022 “Interactive OMR-Assisted Transcription of Mensural Sources Using MuRET.” Workshop presented with David Rizo, Jorge Calvo-Zaragoza, and Juan C. Martínez-Sevilla at the Music Encoding Conference, Dalhousie University, Halifax, Nova Scotia, Canada, 19 May. (*Refereed*)
- 2021 “OMR and Digital Technologies Applied to Music.” Invited lecture for Paleography course, Centro de Estudos de Sociología e Estética Musical (CESEM), NOVA University of Lisbon, Portugal (online), 2 December.
- “Workshop I: Making Rodan Work for You.” Invited lecture for the Digital Humanities in Early Music Research 2021 – Session I: OMR-Capable Chant Editors, Prague (online), 18 March.

- “Digital Infrastructures for Mensural Music Using MEI.” Invited lecture for the Kolloquium Musikwissenschaft, Freiburger Forschungs- und Lehrzentrum Musik (FZM), Freiburg, Germany, 26 January.
- “Encoding Mensural Notation with MEI.” Invited lecture for Paleography course, University of Freiburg, Freiburg, Germany, 25 January.
- 2020 “Workshop II: Hands-on MEI Encoding.” Invited shared lecture and hackathon for the Digital Humanities in Early Music Research I Series – Session II: Early Music Databases and Encoding, Prague (online), 30 June.
- “Workshop I: Introduction to MEI.” Invited shared lecture for the Digital Humanities in Early Music Research I Series – Session II: Early Music Databases and Encoding, Prague (online), 24 June.
- “MEI for Encoding Mensural Music – A Survey.” Invited lecture for the Digital Humanities in Early Music Research I Series – Session II: Early Music Databases and Encoding, Prague (online), 22 June.
- 2019 “Digitization and Encoding of the Musical Contents of a Set of Guatemalan Choirbooks.” Invited lecture for Multimedia Systems (GLIS 633) course, McGill University, Montréal, Québec, Canada, 27 November.

HONORS AND AWARDS

- 2024 TEI Travel Bursary (1000€) for conference presentation.
Text Encoding Initiative (TEI).
- 2024 Inclusiveness Target Country (ITC) Conference Grant (1000€).
European Cooperation in Science & Technology (COST) Action CA21161.
- May 2018–April 2022 FRQSC Grant (\$21,000 CAD/year for four years).
Fonds de Recherche Société et Culture du Québec, Canada.
- 2019–2020 McGill nominee for the Northeastern Association for Graduate Schools (NAGS)
Distinguished Master’s Thesis Award.
Graduate and Postdoctoral Studies, McGill University, Canada.
- 2019 CIRMMT Inter-Centre Research Exchange Funding (\$2,500 CAD).
Centre for Interdisciplinary Research in Music Media and Technology, Canada.
- 2019 Best Paper Award: “Application of Music-Encoding Technologies to Guatemalan
Choirbooks, Facilitating Preservation and Musicological Studies of the Colonial
Repertoire.” Music Encoding Conference, Vienna.
- 2018, 2019 CIRMMT Travel Award (\$1,000 CAD) for conference presentation.
Centre for Interdisciplinary Research in Music Media and Technology, Canada.
- 2013 Honors mention for undergraduate thesis.
Universidad del Valle de Guatemala, Guatemala.
- 2007, 2010 Academic distinction.
Universidad del Valle de Guatemala, Guatemala.

2007–2009

Blackburn Scholarship.
Universidad del Valle de Guatemala, Guatemala.

SERVICE TO THE PROFESSION

Peer-Review of Journal Articles

- Resonancias: Revista de investigación musical, Instituto de Música de la Pontificia Universidad Católica de Chile (2024)
- Transactions of the International Society for Music Information Retrieval (TISMIR 2024)
- Journal of the Text Encoding Initiative (jTEI 2024)

Conference Organization

- Program committee member, Latin American Music Information Retrieval (LAMIR 2024)
- Program committee member & session chair, Text Encoding Initiative (TEI 2024)
- Program committee member, Digital Technologies Applied to Music Research Conference: Methodologies, Projects and Challenges (2024)
- General chair, Digital Libraries for Musicology (DLfM 2024)
- Program chair, Digital Libraries for Musicology (DLfM 2023)
- Session chair, Digital Libraries for Musicology (DLfM 2022)
- Program committee member & session co-chair, Music Encoding Conference (MEC 2021)
- Program committee member, Digital Libraries for Musicology (DLfM 2021)

Music Encoding Initiative (MEI).

- Board Member (2020–2022, 2025–2027)
- Mensural Interest Group Co-Chair (2020–2021, 2024–present)
- Hackathon: Development of CMME/MEI converter, funded by Cluster 6 Biblissima+ (2024)
- Reviewer of Spanish translation of MEI tutorials (2023–present)
- Editor of the Guidelines (2020–present)
- Member and collaborator in the Mensural Interest Group (2016–present)

Digital Analysis of Chant Transmission (DACT), Canada.

Partnership grant funded by the Social Sciences and Humanities Research Council (SSHRC) of Canada, PI Jennifer Bain.

- Member of the DACT Cantorales Working Group, chaired by Virginia Blanton, which focuses on Spanish chant books (cantorales) in the Americas and beyond (2022–present)

Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT), Canada.

- Student coordinator of Research Axis 2: Music information research (2017–2019)
- Student member (2016–2022)

International Society for Music Information Retrieval (ISMIR).

- Keynote speaker at the first Latin American Music Information Retrieval workshop (LAMIR 2024)
- Member (2017–present)

OTHER ACTIVITIES

- 2011 Choir member in Gluck's *Orfeo ed Euridice*, directed by Massimo Pezzutti.
Universidad Internaciones, Guatemala City, Guatemala.
- 2010–2012 Opera singing training with soprano Karin Rademann.
Guatemala City, Guatemala.
- 2009 Workshop in Music Reading.
Universidad Internaciones, Guatemala City, Guatemala.
- 2010, 2012 Basic training in violin and piano.
- 2007–2014 Personal tutor for Mathematics, Statistics, and Physics.

COMPUTER EXPERIENCE

- Programming languages: Knowledge of *Python*, *JavaScript*, *Max/MSP*, *MATLAB*, and *C++*.
- Music encoding formats: Intermediate knowledge of *MEI*, *LilyPond*, *Humdrum*, and *GABC*.
- Document markup language: Intermediate knowledge of *LaTeX*.

LANGUAGES

- Spanish: native language
- English: proficient