MICHAEL SCOTT ASATO CUTHBERT

3029 Lowrey Ave B1212   July 2024
Honolulu, Hawaii 96822

cuthbert@post.harvard.edu
michael.asato.cuthbert@gmail.com
+1 (413) 575-6024

EDUCATION

1998–2006	**Harvard University** PH.D. 2006, A.M. 2001
	Dissertation: "Trecento Fragments and Polyphony beyond the Codex"
	Committee: Thomas Forrest Kelly (principal), Reinhold Brinkmann, John Nádas
1994–1998	**Harvard University** A.B. *summa cum laude* (music)
	Phi Beta Kappa member

FACULTY POSITIONS

2014–24	Associate Professor of Music (with tenure), M.I.T.
	Faculty Director of Digital Humanities, M.I.T. 2017–20
	Associate Head for Music: Music & Theater Arts, 2023
2011–14	Homer A. Burnell Career Development Professor and
	Associate Professor of Music, M.I.T.
2008–11	Assistant Professor of Music, M.I.T.

Visiting appointments

2017	Visiting Associate Professor, Boston University
2006–08	Visiting Assistant Professor, M.I.T.
2005–06	Visiting Assistant Professor, Smith College and Mount Holyoke College
	(joint appointment)

MAJOR AWARDS

2017–21	Mellon Foundation grant, Digital Humanities Lab at MIT ($1.3 million)
2012–13	Radcliffe Institute, Rieman and Baketel Fellow for Music
2012–14	NEH Digging into Data Challenge Grant ($169,000)
2009–12	Seaver Institute Grants for Digital Humanities, `music21` ($325,000)
2009–10	Villa I Tatti, Harvard Center for Italian Renaissance Studies: Ahmanson Fellow
2004–05	Rome Prize of the American Academy in Rome:
	Lily Auchincloss Fellow in Medieval Studies
1998	Fulbright scholarship for study of early music printing in Germany (declined)
1998	Thomas Hoopes Prize (highest award for an undergraduate thesis at Harvard)

For MIT internal awards and smaller grants, see below under Professional Activities and Service.
Total funded research as of April 2024: $2,018,000.

NON-ACADEMIC WORK

Artusi Inc.
Founder, Chief Music Officer, and Principal Software Engineer (2018–)
Adds musical intelligence to automated grading for music theory, ear training, and fundamentals.
Over 1,000,000 student assignments graded over 5,000 courses, saving over 350,000 hours of grading.
www.artusimusic.com

National Bureau of Economic Research
Programing and Systems Consultant (1998–2009)
Full stack lead developer for the largest non-profit economic research organization.
www.nber.org

DIGITAL PROJECTS

Music21: A Toolkit for Computational Musicology. http://web.mit.edu/music21/

Journal Reviews
Ian Quinn, *Journal of the American Musicological Society,* vol. 67, no. 1 (Spring 2014).
Dmitri Tymoczko, *Music Theory Online* 19.3 (September 2013).
        http://mtosmt.org/issues/mto.13.19.3/mto.13.19.3.tymoczko.php

Other Reviews
Ryan Groves, McGill University report (March 2013)
        http://www.ryangroves.com/courses/MUMT621/HW4/music21.pdf

Monograph-equivalent versions: 1.0 (2012)
Major versions (peer-reviewed-article equivalent): 2 (2014), 3 (2016), 6 (2020)
Minor versions: 4 (2017), 5 (2018), 7 (2021), 8 (2022), 9 (2023)

Democracy in Africa: Simulations for Research and Teaching (2020)
        https://democracy-africa.dhmit.xyz and https://github.com/dhmit/democracy_africa
        P.I. (final author) with Evan S. Lieberman (lead author), Ryaan Ahmed, Luke Hollis, Stephan
        Risi, Erica Zimmer, Melissa Calvert, Angelica Castillejos, Crista Falk, Benjamin Gao,
        Montserrat Garza, Michelle He, Meesue Kim, Amy Lei, Ning-Er Lei, Felix Li, Jason Lin, Ivy
        Mao, Mayowa Songonuga, Justice Vidal, Dylan Weber, Jordan Wilke, Samantha York, Sirena
        Yu, Ophelia Zhu

The Reading Redux: Exploring the Value of Rereading (2019)
        https://rereading.dhmit.xyz and https://github.com/dhmit/rereading
        P.I. (final author) with Sandy Alexandre (lead author), Ryaan Ahmed, Erica Zimmer, Luke
        Hollis, Kidist Adamu, Ife Ademolu-Odeneye, Melissa Calvert, Angelica Castillejos, Stephan
        Ducrepin, Crista Falk, Benjamin Gao, Raquel Garcia, Montserrat Garza, Michelle He, Meesue
        Kim, Amy Lei, Ning-Er Lei, Felix Li, Jason Lin, Ivy Mao, Sage Maxwell, Catherine Mei,
        Sergio Perez, Parul Singh, Mayowa Songonuga, Justice Vidal, Christina Wang, Dylan Weber,
        Jordan Wilke, Jessica Wu, Angel Yang, Funing Yang, Samantha York, Sirena Yu, Katherine
        Zeng, Ophelia Zhu

Tobacco Networks: The Industry's Correspondence Networks at a Glance (2019)

> https://tobacconetworks.dhmit.xyz and https://github.com/dhmit/tobacco_networks
>
> P.I. (final author) with Stephan Risi (lead author), Ryaan Ahmed, Erica Zimmer, Kidist Adamu, Ife Ademolu-Odeneye, Angelica Castillejos, Crista Falk, Raquel Garcia, Christina Wang, Jordan Wilke, Jessica Wu, Angel Yang, Sirena Yu

Archival History of Computing at MIT, 1950–62 (2019)

> https://comphist.digitalhumanitiesmit.org
>
> lead author with Stephan Risi, Lisa Tagliaferri, Erica Zimmer, Alan Abreu, Ife Ademolu-Odeneye, Dina Atia, Rikita Bansal, Elena Boal, Angelica Castillejos, Mingfei Duan, Maritza Gallegos, Monsterrat Garza, Meesue Kim, Keith Murray, Carol Pan, Mayowa Songonuga, Felix Tran, Samantha York, Emily Caragay, Alena Culbertson, Howard Dacosta, Assel Ismoldayeva, Elsa Itambo, Kelsey Merrill, Charlotte Minsky, Isaac Redlon, Shobhita Sundaram, Katherine Xu, Derek Yen, Sophia Zhi, Nicole Fountain, Ryaan Ahmed

Computational Reading of Gender in Novels, 1770–1922 (2019)

> http://gendernovels.digitalhumanitiesmit.org/
>
> lead author with Lisa Tagliaferri, Stephan Risi, Ife Ademolu-Odeneye, Dina Atia, Elena Boal, Emily Caragay, Susannah Chen, Alena Culbertson, Howard DaCosta, Mingfei Duan, Maritza Gallegos, Assel Ismoldayeva, Elsa Itambo, Michelle Li, Kelsey Merrill, Charlotte Minsky, Keith Murray, Carol Pan, Isaac Redlon, Shobhita Sundaram, Felix Tran, Kate Xu, Derek Yen, Samantha York, Sophia Zhi

PUBLICATIONS

Co-authored articles in traditional musicological forums have equal responsibility among the authors. For computational musicology articles, I have noted those where someone else is first author with [*], otherwise, I am lead author.

2024	*Artusi: Music Theory Now,* vol. 1, electronic textbook and workbooks, with Kristin Hansen and Joel Rust.
2022	"Two 'Textless' Elaborations of Chant from the Ivrea Codex," in *Manuscripts, Music, Machaut: Essays in Honor of Lawrence Earp*, edited by Jared C. Hartt, Tamsyn Mahoney-Steel, and Benjamin L. Albritton (Turnhout: Brepols), pp. 485–95.
2021	Foreword to *The Textless Works of the Prague Manuscript, CZ-Pu XI E 9,* edited by Jos Haring & Kees Boeke (Arezzo: Olive Music).
2020	*Artusi: Interactive Music Fundamentals,* electronic textbook and workbook, with Ryaan Ahmed, Julia Cavallaro, Darren LaCour, Joel Rust, and Joseph VanderStel. (December)
	"Melodic Searching and the Anonymous Unica of San Lorenzo 2211," in *The End of the Ars Nova in Italy* (Florence: Sismel), edited by Antonio Calvia et al., pp. 151–61.
2019	"The RomanText Format: A Flexible and Standard Method for Representing Roman Numeral Analyses," with Dmitri Tymoczko[*], Mark Gotham, and Christopher Ariza, *Proceedings of the International Society for Music Information Retrieval* (ISMIR) 20.
2018	"Trecento I: Secular Music" and "Trecento II: Sacred Music and Motets in Italy and the East from 1300 until the End of the Schism," chapters 35 and 36 in *Cambridge History of Medieval Music*, edited by Mark Everist and Thomas Forrest Kelly, pp. 1079–1124.

2017 "Emotion Painting: Lyric, Affect, and Musical Relationships in a Large Lead-Sheet Corpus," co-first author with Sophia H. Sun, *Empirical Musicology Review* 12.3–4, pp. 327–48. Published 2018. http://emusicology.org/article/view/5889/4974

2016 "Identificazioni di composizioni vocali italiane e internazionali in alcuni manoscritti liturgici del tardo Trecento," *Rivista internazionale di Musica Sacra* 37.1–2 (December 2016), pp. 219–27; with Nicola Tangari.

2015 "Difference, Disability, and Composition in the Late Middle Ages: Of Antonio 'Zachara' da Teramo and Francesco 'Il Cieco' da Firenze," chapter 26 in *Oxford [University Press] Handbook of Music & Disability Studies,* edited by Blake Howe, Stephanie Jensen-Moulton, Neil Lerner, and Joseph Straus, pp. 517–28.

"Music," chapter 26 in *Dante in Context* part of the *Cambridge [University Press] Works of Dante* series, edited by Lino Pertile and Zyg Baranski, pp. 448–57.

2014 "Church Polyphony apropos of some Old Fragments in Rome," *L'ars nova italiana del Trecento* 8, pp. 167–81.

"A Postscript to the Montefortino Fragment with Transcriptions," *L'ars nova italiana del Trecento* 8, pp. 449–60.

"Improving Rhythmic Transcriptions via Probability Models Applied Post-OMR," *Proceedings of the International Society for Music Information Retrieval* (ISMIR) 15, pp. 643–48. With Maura Church[*]. Oral presentation at conference.

2013 *City, Chant, and the Topography of Early Music*, in honor of Thomas Forrest Kelly. Edited with Sean Gallagher and Christoph Wolff (Cambridge, Mass: Harvard Music Dept.). Reviews: Kate Helsen, *Plainsong and Medieval Music* 23.2 (2014), pp. 256–59; Chadwick Jenkins, *Notes* (2015), pp. 525–27; William Flynn, *Music & Letters* 96.4 (2015), pp. 642–44.

"Changing Musical Time at the Beginning of the Renaissance (and Today)," in *Renaissance Studies in Honor of Joseph Connors* (Cambridge, Mass.: Harvard University Press), edited by Louis A. Waldman and Machtelt Israëls. vol. 2, pp. 572–80 + 699.

2012 "Monks, Manuscripts, and Other Peer-to-Peer Song Sharing Networks of the Middle Ages," in *Cantus scriptus: Technologies of Medieval Song, 3rd Lawrence J. Schoenberg Symposium on Manuscript Studies in the Digital Age,* edited by Lynn Ransom (Piscataway, N.J.: Gorgias Press), pp. 101–23.

"International Style and Medieval Italian Music: A Flemish Motet in the Ascoli Piceno/ Montefortino Fragment," with Sasha Zamler-Carhart. in *Fama e* publica vox *nel Medioevo: Atti del Convegno di Studio…Ascoli Piceno, Palazzo dei Capitani, 3–5 December 2009,* edited by Isa Lori Sanfilippo and Antonio Rigon (Rome: Istituto Storico Italiano per il Medio Evo, 2011 [i.e., 2012]), pp. 213–27.

"Interoperable Digital Musicology Research via `music21` Web Applications," *Proceedings of the Joint CLARIN-D/DARIAH Workshop, Service-oriented Architectures (SOAs) for the Humanities: Solutions and Impacts at the Digital Humanities Conference,* Hamburg, Germany, July 2012, lead author with Beth Hadley, Lars Johnson, and Christopher Reyes.

2011 "Groups and Projects among the Paduan polyphonic sources," in *I frammenti musicali padovani tra Santa Giustina e la diffusione della musica in Europa*, edited by Francesco Facchin and Pietro Gnan (Padua, 2011), pp. 183–214.

"Feature Extraction and Machine Learning on Symbolic Music using the `music21` Toolkit," *Proceedings of the International Symposium on Music Information Retrieval*; lead author with Christopher Ariza and Lisa D. Friedland, pp. 387–92.

"The Nuremberg and Melk Fragments and the International *Ars Nova*," *Studi Musicali* Nuova serie 1, no. 1 (2010) [i.e., 2011], pp. 7–51.

"Hidden Beyond MIDI's Reach: Feature Extraction and Machine Learning with Rich Symbolic Formats in `music21`" *Proceedings of the Neural Information Processing Systems Conference* (Music and Machine Learning, Workshop 4), lead author with Christopher Ariza, Jose Cabal-Ugaz, Beth Hadley, and Neena Parikh.

"Score Following from Inaccurate Score and Audio Data using OMR and `music21`" *Proceedings of the Neural Information Processing Systems Conference* (Music and Machine Learning, Workshop 4), with Jordi Bartolomé Guillen[*].

"The `music21` Stream: A New Object Model for Representing, Filtering, and Transforming Symbolic Musical Structures," *Proceedings of the International Computer Music Conference;* with Christopher Ariza[*], pp. 61–68.

"Analytical and Compositional Applications of a Network-Based Scale Model in `music21`," *Proceedings of the International Computer Music Conference;* with Christopher Ariza[*], pp. 701–8.

The Soul of Wit: Microfestschrift Rob Wegman zum 50. Geburtstag. A "collection of tiny essays, negative-research papers, spoofs, and other offerings by his friends and colleagues." Editor and contributor of article, "Polyphony and its Absence in the Incunabula of the Biblioteca Nazionale of Florence (with some Mann thrown in for good measure)." 86pp.

2010   "Style, Locality, and the Trecento Gloria: New Sources and a Reexamination," *Acta Musicologica* 82 (2010), pp. 185–212; with Elizabeth Nyikos.

"Tipping the Iceberg: Missing Italian Polyphony from the Age of Schism," *Musica Disciplina* 54 (2009) [i.e., 2010], pp. 39–74.

"`music21`: A Toolkit for Computer-Aided Musicology and Symbolic Music Data," *Proceedings of the International Symposium on Music Information Retrieval*; lead author with Christopher Ariza, pp. 637–42. Oral presentation at conference.

"Modeling Beats, Accents, Beams, and Time Signatures Hierarchically with `music21` Meter Objects," *Proceedings of the International Computer Music Conference*; with Christopher Ariza[*], pp. 216–23.

Bologna Q15: the making and remaking of a musical manuscript by Margaret Bent, review for *Notes* 66.3 (March), pp. 656–60.

2009   *Ars nova: French and Italian Music in the Fourteenth Century,* edited with John L. Nádas (*Music in the Medieval World Reference Series* vol. 6). London: Ashgate. Reviewed by Gary Towne, *The Medieval Review,* February 2010.

"Palimpsests, Sketches, and Extracts: The Organization and Compositions of Seville 5-2-25," *L'Ars Nova Italiana del Trecento* 7, pp. 57–78.

Der Mensural Codex St. Emmeram: Faksimile der Handschrift Clm 14274 der Bayerischen Staatsbibliothek München by Ian Rumbold and Peter Wright, review for *Notes* 65.4 (June), pp. 252–4. (erratum Dec. 2009)

2008   "A New Trecento Source of a French Ballade (*Je voy mon cuer*)," in *Golden Muse: The Loeb Music Library at 50. Harvard Library Bulletin,* new series 18, pp. 77–81.

2007   "*Esperance* and the French Song in Foreign Sources," *Studi Musicali* 36.1, pp. 1–19.

2006   "Generalized Set Analysis and Sub-Saharan African Rhythm? Evaluating and Expanding the Theories of Willie Anku," *Journal of New Music Research* (formerly *Interface*) 35.3, pp. 211–19.

2005   "Zacara's *D'amor Languire* and Strategies for Borrowing in the Early Fifteenth-Century Italian Mass," in *Antonio Zacara da Teramo e il suo tempo*, edited by Francesco Zimei, (Lucca: Libreria Musicale Italiana, 2004 [i.e., 2005]), pp. 337–57 and plates 10–13. Originally read at the eponymous *convegno internazionale di studi*, Teramo, Italy, December 6–8, 2002.

2001   "Free Improvisation: John Zorn and the Construction of Jewish Identity through Music," in *Studies in Jewish Musical Traditions*, edited by Kay Kaufman Shelemay (Cambridge, Mass.: Harvard College Library). pp. 1-31.

2000   "Original Sources: Manuscript and Printed," with Jennifer G. Lee, in *Johann Sebastian Bach, "The Man from Whom All True Musical Wisdom Proceeded," A 250th Anniversary Exhibition*, edited by Christoph Wolff (Cambridge, Mass.: President and Fellows of Harvard College).

OTHER PUBLICATIONS

2019   "[Notre Dame can be rebuilt, but its unique sound may be gone forever](#)," op-ed for *The Los Angeles Times,* 16 April.

2010   "Living in Musical Time," essay (5500 words) for the Boston Chamber Music Society, Winter Festival and Forum on Musical Time.

2008   Completion of Zacara da Teramo's fragmentary ballata, *D'amor Languire,* recorded by Ensemble Micrologus on their disc "Un Fior Gentile."

2006   Program notes for concert of the works of Augusta Read Thomas at Smith College. Also notes on Berio, *Duetti*; Stravinsky, *Concertino*; Debussy, *Sonata* for flute, viola, and harp; and arias from two Bach cantatas.

2002–04   Program notes for the Fromm Foundation. Works include Webern op. 27, Knussen op. 24, Copland *Piano Variations*, Ligeti *Cello Concerto*, Scelsi *Anahit,* Murail *Ethers*, Sciarrino *Hérmes*, Carter *Double Concerto*, Davidovsky *Synchronisms 6,* and Crumb *Vox Balaenae.*

COMPLETED, ACCEPTED, AND AWAITING PUBLICATION
None Currently

UNDER CONSIDERATION
"Megabytes of Motets: Text and Sonority in a Complete Digital Edition of the Montpellier and Bamberg Codices," *Early Music* (Oxford University Press), 4700 words (with Kevin J. Costello)

IN PRESS
None currently

IN PROGRESS

Ars Mutandi: Italian Sacred Music in the Age of Plague and Schism, monograph book. (Complete draft available)

"Species or Specious? On the 'rules' of interval and range in early modern music (*c.* 1300–1600)," co-first author with Mark Gotham.

PRESENTATIONS

2024   "A.I., Similarity, and Search in Medieval Music: New Methodologies and Source Identifications," Invited Speaker, All Souls Seminar in Medieval and Renaissance Music, Oxford, England, December 5 *(forthcoming)*.

"Encode Fast, Decode Often," Invited Keynote Speaker, Music Encoding Conference, University of North Texas, May 22.

2023   "The Forgotten 'Renaissance': Pushing the Limits in the Fifteenth Century," Guest Lecture, University of Denver, 8 November.

"Computational Music Studies and the Dangers of Canonization," invited lecture, Musicology Symposium, University of Hawaiʻi, Mānoa, 3 November.

2022   "The Future Drags Us Backwards: The Dangers of Canonization in Computational Music Studies," Department of Music Lecture Series (invited), Washington University of St. Louis, 18 November.

"*Frammenti di Ardesia:* New Italian Concordances on Parchment, Paper, and Slate," invited presentation "Tesori di riuso *[Treasures of Reuse],*" Cremona, Italy, 26 May.

2020   "Nuit et Jour," Pre-concert lecture for Sollazzo Ensemble, Antwerp (virtual), 23 August.

"Online Music Instruction in the Covid-19 Era," Karajan/Music Tech conference (virtual), 3 April, with [follow-up interview](#) on *Junge Reporter*.

"Songs about Hope or Lessons in Love," Pre-concert lecture for Blue Heron Renaissance Choir, Cambridge, Mass., 22 February.

"Music Decoding: Forgetting Perfection, Finding Results in Digital Musicology," Princeton University, 7 February. Also led seminar on `music21` invited by the Center for Digital Humanities, Princeton.

2019   "Computer Programming for Corpus Analysis," Invited Graduate Student Workshop Program Seminar, Society for Music Theory, Columbus, Ohio, 8 November.

"Hearing the Lost Music of the Middle Ages through Fragments and Algorithms," invited lecture, Harvard University Medieval Studies Seminar Series, 16 September.

"Space, Time, and Uncertainty: Catalogue Structure in the Digital Era," conference paper on panel, *The Census-Catalogue at 40*, Medieval and Renaissance Music Conference, Basel, 4 July.

"The Edition's Messy but the Notes are Plenty: An Introduction to Big Data Score Studies," invited lecture, Bienen School of Music, Northwestern University, 11 April.

2018 "'For the Use of Sister Laudomina': Nuns and the transmission of Vernacular Music Theory in Fifteenth-Century Italy," presentation as part of a panel on Women in the History of Music Theory, Society for Music Theory national conference, San Antonio, 2 November.

"Imperfect Musicology," invited lecture, "Scores of Scores: Possibilities and Pitfalls with Musical Corpora," Cambridge University Big Data Research Initiative, 19 June.

"Distant Listening/Digital Musicology: `music21` and Compositional Similarity in the late Middle Ages," invited lecture, Columbia University Society of Fellows, 1 May.

"Music, Computational Search, and Digital Humanities: Low-Hanging Fruit from the *Ars Mutandi,*" invited talk, Corpus Monodicum Workshop, Würzburg, Germany, 16 April.

"Weaving Connections Among Early Music Sources using IIIF," invited talk, New England IIIF Showcase, Harvard University, 14 March.

2017 "Melodic Searching and the Anonymous Unica of San Lorenzo 2211," presented at conference, "The Nature of the End of the Ars Nova in Early Quattrocento Italy," Florence, 14–16 December (Pub. 2020).

"Hear the Dragon: Chant, Medieval Music, and the Northeastern Dragon Prayer Book," invited lecture, Northeastern University, 17 October.

"How Computational Musicology Has Failed, and Why That's a Good Thing," invited lecture, Cornell University, 21 September.

"Species or Specious?: On the 'Rules' of Intervals and Range in Early Music (1300–1600)," presented at Symposium for Digital Musicology, Senate House, London. With Mark Gotham. 1 September.

"Trecento Theory in Italian and Italian Theorists as Composers," presented at the Medieval and Renaissance Music Conference, Prague, Czech Republic, 5 July. (Repeated in expanded form, Yale University, 23 April 2018)

"Searching in Digital Medieval Score Databases: Moving from Metadata to Big Data," invited lecture, Music Librarian Association, New England Chapter (NEMLA), Cambridge, Mass. 2 June.

"Hidden in our publications: New Concordances, Quotations, and Citations in Fourteenth-Century Music," presented at the International Musicology Society, Quinquennial Congress, Tokyo 19–23 March, and the International Symposium on Late-Medieval and Renaissance Music, Kloster Neustift/Novacella, Brixen, Italy, 30 June.

2016 "Hidden in our publications: New Concordances, Quotations, and Citations in Fourteenth-Century Music," presented at American Musicological Society Meeting, Vancouver, 3–6 November. Also presented at American Musicological Society, New England Chapter meeting, Smith College, 1 October.

"Moving Forward and Holding Back: Challenges to Computational Approaches to Music Research," invited keynote lecture for *Inertia/Momentum: Sound, Media, and the Digital Humanities*, UCLA 28 April.

"How Do Computers 'Hear' Music? An Introduction to Digital Musicology," invited lecture, West Virginia University, 22 February.

2015 "Hidden in our publications: Uncovering concordances, citations, and influence in Medieval music through databases and programming," invited lectures, delivered at (1) All Souls College, Oxford, 22 October, (2) Tufts University music colloquium series, 9 November, (3) Boston University music seminar series, 9 December.

"Peer-Review and Publication of Unprintable Materials," invited panel, *Beyond the Printed Page: Electronic Publishing and its Implications for Musicology,* AMS Louisville, 14 November.

"What's Lost and What's Gained When We Dumb Down Musicology for the Computer," invited lecture, Florida State University, 1 October.

"Analyzing Music with Computer, Ear, and Mind," invited talk, Eliette und Herbert von Karajan Institut, 24 July.

"Hochrangigen Abstraktionen für Computational symbolischen Musiksuche [High-level Abstractions for Computational Searches of Symbolic Music]," invited lecture, Institut für Musikwissenschaft und Musikinformatik, Hochschule für Musik, Karlsruhe, 20 July.

2014 "Atlas: Mapping Reworked Polyphony in Late-Medieval Europe," invited lecture, *Reworkings: Musical re-elaboration and cultural context,* Schola Cantorum Basiliensis, Musik Akademie Basel, 22 November. With Pedro Memelsdorff.

"Fox and Hedgehog Musicology: Statistical and Digital Approaches to Old Problems," invited lecture, Princeton University Colloquium Series, 6 October.

"Searching and Analyzing Renaissance Musical Scores with Computational Methods," Renaissance Society of America, New York City, 27 March.

2013 "Graduate Education in the Digital Age," invited colloquium, American Musicological Society Meeting, Pittsburgh, 7–10 November.

"Music, Manuscripts, and Megabytes: Unlocking sound in the *Ars Mutandi* (1340–1420)," MIT Ancient and Medieval Studies Colloquium Series, 19 September.

"Identifying Quotations and Concordances in Ars Nova Music with Computational Methods," *Medieval and Renaissance Music Conference,* Certaldo, Italy, 4–9 July.

"Music Education with `music21`," NYU Music Education Hackathon, 28 June. (Remote presentation from Brixen).

"The Credo 'Qui sonitu melodie': Quotation, Paraphrase, and Influence in the *Ars Mutandi,*" invited lecture, *International Symposium on Late Medieval and Early Renaissance Music,* Kloster Neustift/Novacella, Brixen, Italy, 26 June.

"*Dell'Anima Illuminato*: Disability and its Impact on the Music of Francesco, Zachara, and other Medieval Composers," conference on Music and Disability, City University of New York, 21 May. (Pub. 2015)

"`music21`, EMMSAP, and ELVIS: New Connections in Searching and Reduction of Large Corpora," annual meeting, Center for Interdisciplinary Research in Music Media and Technology*,* McGill University, 10 May.

"The Right Tune in a Sea of Notes: Searching Musical Scores with Musical Intelligence," invited lecture, Harvard University forum, *Expanding the Boundaries of Authorship,* 15 April.

"With Computer, Ear, and Mind: New Approaches to Centuries-Old Problems in Music History," invited lecture, Dartmouth College, 7 March.

"Hacking Symbolic Music with the `music21` Toolkit," presentation, inaugural meeting, European Forum for Digital Musicology co-sponsored by the Vienna Classical Music Hack Day, Vienna, 2 February.

"On Music, Kings, and The Sun," invited lecture for panel on music, the sun, and the environment (on Stephen Hartke's *The King of the Sun* and Johannes Ciconia's *Le ray au soleyl),* Boston Chamber Music Society, January 19.

2012 "Humdrum and `music21`: New and successful approaches to Digital Musicology," invited lecture, Ohio State University, 21 November.

"Ciconia, Zachara, and the Italianization of European Music around 1400" presented at American Musicological Society Meeting, New Orleans, 1–4 November.

"Teaching Musicology in a 2.0 World," invited presentation for the "Master Teacher Session: Teaching the Discipline, Disciplining the Teacher" at AMS, New Orleans, 1–4 November.

"Common Blunders and Golden Opportunities: Learning from Past Digital Music Projects," Conference Paper, *Transcribing the Beneventan Chant*, Radcliffe Institute for Advanced Study, 19 October.

"Understanding Music in the Age of Plague and Schism with Computer, Mind, and Ear," invited talk, Distinguished Lecture Series, UCLA Music Department. 11 October.

"Computational musicology and the `music21` Toolkit," Harvard ABCD Group, 1 October.

"Digital Musicology of Late Medieval Polyphony," Radcliffe Institute for Advanced Study, 19 September.

"Codieren von Musiknoten für analytische Abfragen," invited lecture, Department of Computer Science, Ludwig Maximilians Üniversität, Munich, 12 July.

"Corpus Research using the `music21` Toolkit," keynote lecture, Northeast Music Cognition Group semiannual meeting, Yale University, 28 April.

"What were the odds?: Reexamining Early (and not-so-Early) Music with statistical models," invited lecture by the graduate students, Department of Music, Duke University, 30 March.

"Research on Musical Corpora with `music21`: Completed Tasks and Future Applications," Workshop on Processing Large Amounts of Musical Information, McGill University, 17 February.

2011 "Gothic Survival in Trecento Polyphony," The Gothic Revolution: Music in Western Europe 1100–1300, Princeton University, 4–6 November.

"Computational Approaches to Music Theory and Analysis: Overview and Hands-on Tutorials," Society for Music Theory, Minneapolis 27 October.

"Computational Musicology and the *Ars Nova:* Four Case Studies using `music21` (with a new French fragment of Polyphonic music)," presented at the Medieval and Renaissance Music Conference, Barcelona, Catalonia, Spain, 4–10 July.

"Nouvelles découverts de manuscrits et de nouvelles orientations informatique pour la musique du Trecento et de la Renaissance (New Manuscript Discoveries and New Computational Directions in Music of the Trecento and Early Renaissance)" invited lecture Centres d'Études Supérieurs de Renaissance, Tours, France, 22 June.

"Teaching Music History with Technology (But not for Technology's Sake)" AMS-NE Chapter Spring Meeting, Providence College, 30 April.

"Listening Faster: How Digital Humanities is Transforming Music Scholarship," Harvard–M.I.T. Joint Digital Humanities Forum, with Matthias Röder. 22 April.

"Peers, Mentors, and the First-Generation Experience," invited panelist for "Diversity in Higher Education: Academic Career Pathways," Harvard University, 7 April.

"*Out of the branches, grow many trunks:* music21 and the Promise of Linked Data in Early Music," Department of Music and e-Research Center, Oxford University, 1 April.

"Computational Musicology with the music21 Toolkit," NYU Music and Audio Research Lab, 4 February.

2010   "Where'd All the Songs Go? The Statistical Methodologies Behind *Tipping the Iceberg* and the New View of Early Music," Boston Renaissance Musicology Colloquium Series (Boston University), 23 November.

"Studying *Musica Ficta* and Early Renaissance Canons with the music21 Toolkit," Lila Wallace/Reader's Digest Founder's Lecture in Renaissance Studies, Harvard University (Digital Humanities Forum), 22 November.

"Monks, Manuscripts, and Other Peer-to-Peer Song Sharing Networks of the Middle Ages," invited lecture for the Schoenberg Symposium on Manuscript Studies, University of Pennsylvania, 19–20 November.

"Modeling Musical Structures as Objects in music21," for the Society for Music Theory/American Musicological Society annual conference, Indianapolis, 4–7 November, with Christopher Ariza.

"From Ancient Greece to Kendall T: The Musical Legacy of Pythagoras," MIT Council for the Arts annual meeting, 27 October.

"music21: Music Informatics for Music Cognition," Northeastern Music Cognition Group, Berklee College of Music, 23 October.

"An idea whose time has come," interview about parallels between evolutionary theory and musical development. BBC Radio, 7 October.

"New (and Old) Motets and Mass Movements from Central Europe, Italy, and Beyond," for the 10th International Symposium on Late Medieval and Early Renaissance Music, Novacella, Italy, 28 June–3 July.

"Polifonia italiana fra fine Trecento e primo Quattrocento: nuove metodologie e conclusioni," invited lecture Università di Roma, "La sapienza," 17 May.

Organizer and Panelist on "Time and the Structure of Music" for the Boston Chamber Music Society, Winter Festival and Forum on Musical Time (9 January). Followed by a more specialized lecture, "Repeating Time: Minimalism and the Structure of Reich's *Four Organs,*" 11 January.

2009   "Fragments, Computer Technology, and the New Music History of the Era of Plague and Schism," Villa I Tatti, Florence, Italy, 5 November.

"The Trecento Gloria," *Beyond 50 years of Ars Nova Studies at Certaldo*, International Conference 12–14 June.

"The English Countenance before the English: 'Fifteenth-century' style traits in fourteenth-century Italy," invited paper, *John Dunstaple (ca. 1390–1453): English Polyphony in Fifteenth-Century Italy*, fondazione Giorgio Cini, Venice 23 May.

"Manuscript Destruction and Content Reconstruction in Early Fifteenth-Century Music," invited paper, *Palimpsests in Perspective*, American Academy in Rome, 6 March.

"Musical Artifacts in Unlikely Places: Rare Chant Sources in the MIT Library Collection," special event at the Lewis Music Library at M.I.T. on the occasion of new donations of chant manuscripts and early printed books at M.I.T. 3 March. (online: http://mitworld.mit.edu/video/653/)

2008   "Italian Sacred Music during the Great Schism in Light of New Discoveries," American Musicological Society Meeting, Nashville, 6–9 November.

"Modeling Music(ology) with Computer Algorithms," invited presentation for a panel sponsored by the Committee on Career-Related Issues, AMS Nashville, 7 November.

"Computer-Aided Music Analysis and the music21 Platform" invited lecture, UNC Greensboro Composition, History, and Theory Music Forum (co-sponsored by the Department of Computer Science), 12 November. Also gave a second lecture, "The Clarinet's Role in Shaping the Aesthetic(s) of Contemporary Music" to the UNCG clarinet studio.

"L'uso del computer e statistica nello studio dell'ars nova," guest lecture, "Corso di Perfezionamento in L'ars Nova in Europa," Università degli Studi di Roma, "Tor Vergata," Certaldo, 19 June. (Reprised 2009)

"*Ubi sunt? Hic!* The End of Nostalgia and the Appreciation of the Present in late Medieval Music," invited talk New College of Florida, 8 March.

2007   "Ambiguity, Process, and Information Content in Minimal Music," M.I.T. Comparative Media Studies colloquium, invited lecture, 19 April.

"Geek Musicology: the Increasing Use of Computers, Statistics, and other Quantitative Techniques in Empirical Music Research," presentation to the Burchard Scholars, M.I.T., 7 March.

"Fragments and the New History of the Trecento" presentation at Eastman School of Music (2007), Columbia University (2007), M.I.T. (2006), University of South Carolina (2006), Hope College (2005)

2006   "Schisms, Papal Visits, and The Ars Nova Traditions of Cividale," presentation at Harvard University, 8 December.

"A New Source and a Reassessment of the Paduan Fragments and their Context," presented at the annual meeting of the American Musicological Society in Los Angeles, 4 November.

"The Music of John Dunstable," Pre-concert lecture for Blue Heron Renaissance Choir, Cambridge, Mass., 11 November.

"Le fonti padovani e loro relazioni: interiore e con gli altri frammenti italiani," presented at *I frammenti musicali padovani tra Santa Giustina e la diffusione della musica in Europa*, Padua, Italy, 15, June.

"Ambiguity, Near Equality, and the Remains of Serial Organization in Glass's *Einstein on the Beach* and other Minimalist Works," invited lecture at Listaháskóli Íslands, Reykjavik, 20 January. Also conducted a workshop, "Learning Medieval Notation from Medieval Manuscripts," 21 January.

2005 "New Concordances and New Forms of Participation: Preliminary Results and Design Considerations for Expanding Trecento Databases," presented at *Dolci e nuove note: Convegno internazionale del Centro Studi sull'Ars nova italiana del Trecento*, Certaldo, Italy, 17–19 December.

"On Popularity in the Trecento and Zacara's Popularity in Particular," presented at the Medieval and Renaissance Music Conference, Tours, France, 13–16 July.

"Help! There's Music in my Manuscript," invited lecture for the Summer Seminar on Medieval Paleography at the American Academy in Rome, Christopher Celenza, director, 11 July.

"Ambiguity and Certainty in Minimalist Processes," presented at the International Conference on Music Analysis, Dublin, 23–25 June.

"Counting Our Losses: The Missing Polyphonic Works of the Trecento," presented at Musicology at Kalamazoo, International Congress on Medieval Studies, 5–8 May.

2004 "Set Analysis, West African Music, and the Theories of Willie Anku," presented as part of the conference "Approaches to Analysis and Music Theories in Ethnomusicology," EthNoise! conference University of Chicago, 21–22 May. (Pub. 2006)

2003 "Why Simple Polyphony Matters," paper read at the Seminari Internazionali Estivi "Jacopo da Bologna," Dozza, Italy, 8–13 July.

2002 "Zacara's *D'amor Languire* and Strategies for Borrowing in the Early Fifteenth-Century Italian Mass," presented at the Convegno internazionale di Studi, *Antonio Zacara da Teramo e il suo tempo*, Teramo, Italy, 6–8 December. (Pub. 2005)

"Some Observations Concerning the Paduan Fragment 'Pad A' as Part of the Manuscript Context of Bologna Q 15," paper read at the Seminari Internazionali Estivi "Jacopo da Bologna," Dozza, Italy, 8-13 July.

2000 "Minimalist Resources for Maximalist Composers," presentation for the Harvard Group for New Music composition forum, 4 December.

TEACHING

MIT Musicology

Medieval and Renaissance Music (*was* Early Music 800–1680)

Seminar focusing on history of music with special emphasis on four important areas of research: chant, Trecento, English Renaissance, and early baroque Venice. (2007, '08, '09, '10, '11, '13, '14, '15, '17, '19)

Three Upper-division undergraduate lecture/seminars on Music after 1900:

Stravinsky to the Present (2011, '14)

Music from 1900–1960 (2006, '07)

Music after 1960 (2007, '08)

Philosophy and History of Music Notation
Advanced seminar (2013)

MIT Music Technology
Computational Music Theory and Analysis (2020 x2, 2021, 2023)
(formerly **Quantitative and Computational Studies of Music**, 2012)
Programming focused, interdisciplinary course, developed after a grant ($22,800) from the
    SHASS fund for teaching and learning (2012)

MIT Music Theory
Music Fundamentals
Introductory course for students without previous musical knowledge. Taught with substantial
    online components of my own design. (2013, '14–18). In-class keyboard usage developed with a
    grant ($35,000) from the D'Arbeloff Foundation.
Harmony and Counterpoint I
First semester of a four-semester theory course for music majors. (2006, '07, '09)
Harmony and Counterpoint II
Second semester of a four-semester theory course for music majors. Revamped curriculum (2017)
History of Music Theory
Advanced seminar covering the history of Western and global music theory (2021)

Elsewhere
Music Notation: Context, Theory, and Performance
Graduate seminar for Ph.D. students in musicology and ethnomusicology and DMA students at
    Boston University (2017)
Music at the End of the Middle Ages: Italy and France in the Fourteenth Century
Upper division undergraduate seminar at Mount Holyoke College (2005)
Composing Music in the Age of Process
Introductory seminar for music majors at Smith College, focusing on serialism, aleatory, and
    minimalism. (2005)
Music from the "Pre-classical" to the Present
Lecture course given at Smith and Mount Holyoke Colleges (2006)

Teaching Awards
Teaching with Technology Award, Office of Digital Learning, MIT (2017)
James A. and Ruth Levitan Teaching Award, MIT (2015)
        Top award for faculty teaching given by the School of Humanities, Arts and Social
        Sciences, nominated by students and selected by faculty.
Average student evaluation of 6.7 out of 7 across all classes at MIT.

Research Supervision
Dissertation Committees: John Stinson, University of New England (Australia), Ph.D.,
        Musicology, 2022 (Chancellor's Award for best dissertation). Katherine Lin, NYU, Ph.D.
        Piano Performance Studies, 2021/2022. Giacomo Ferris, University of Pavia, Dottore di
        Ricerca (=Ph.D.), Musicology, 2021. Carolann Buff, Princeton, Ph.D. Musicology, 2015.
        Matan Ben-Asher, Ph.D., Bar-Ilan University, in progress (2019–present).

Thesis advisor, bachelor of science (MIT), bachelor of arts (Harvard), master of liberal arts (Harvard), and master of Engineering (MIT) in computer science and applied math with music (seven as of Spring 2024).

Undergraduate Research Advising (UROP Program), advisor to 143 undergraduate research projects as of Spring 2024.

High School Research Supervision, volunteer work on computational music analysis and digital humanities with two Boston area high school students (2016–18, 2019–20).

Advisor to individual studies on **Braille music notation** (2012), **JavaScript-based music rendering** (2012), **music theater composition** (2011), **automated figured bass composition** (2011), and **contemporary violin repertoire** (2006).

RESEARCH GRANTS

External Grants:

Mellon Foundation: Digital Humanities at MIT: principal investigator for project to create new programs and labs in digital humanities and new courses, $1,300,000 (2017–21). In three years after its inception, the DH Lab became the largest undergraduate research project at MIT.

Electronic Locator of Vertical Interval Successions (ELVIS): Digging into Data Challenge Grant funded by the NEH, $169,000 (principal investigator. Ian Quinn, Yale, Co-Investigator), AHRC/ESRC/JISC and SSHRC (~$500,000 total) (2012–14).

Seaver Institute: Three-year grant to fund `music21` (2009–12), $325,000.

Seaver Institute: STAMMR: Small Tools for Agile Medieval-Music Research (2015–17), $25,000.

M.I.T. Internal Grants (only >$20k listed):

D'Arbeloff Fund for remaking music fundamentals with technology and undergraduate assistants; $35,000, 2014.

Boston Camerata, residency, $30,000, 2014–15.

EMMSAP, Electronic Medieval Music Score Archive Project, $24,000, 2012–14.

MISTI (MIT-International Science & Technology Initiative) Germany Seed Fund for "Analytical Approaches to Large-Scale Databases of Musical Scores," with Ludwig-Maximilians-Universität, Munich; $29,260, 2011.

"**MOSS**: the Mobile Sound Studio for Teaching and Learning at MIT." Project for introducing recording to the MIT curriculum; $40,000, 2011.

Quantitative and Statistical Methods for Studying Music History, SHASS Fund for Teaching and Learning innovation grant, $22,800, 2011

PROFESSIONAL SERVICE

World-Wide Web Consortium (W3C)

Editor, MusicXML (2022–). Determine and deliver the specification for MusicXML 4.1 and future versions.

Co-chair, W3C Music Notation Working Group (2022–).

American Musicological Society (AMS)

National Meeting, Program committee, Boston (2018–19). Head of conference committee 2019 (emergency post after death of executive director)

AMS Committee on Technology (was Committee on Internet Technology), chair (2014–2015; co-chair 2012–13)

AMS New-England, Program committee (2012–14)

AMS/MLA RISM Committee, joint committee of the American Musicological Society and the Music Librarian's Association overseeing the project *Répertoire Internationale de Sources Musicale* (2011–14).

(See also under "Conferences Organized" below)

Journals and Publishers

Society for Music Theory (SMT) journal *Music Theory Spectrum,* member, Editorial Board (2013–16).

Journal Referee Reader for *Leonardo* (2019), *PeerJ Computer Science* (2019), *Music Theory Spectrum* (2013, '14, '15, '16), *Dante Studies* (2016), *Frontiers in Psychology* (2015), *Journal of the Royal Musical Association* (2015), *Plainsong and Medieval Music* (2013, '14), *Journal of Musicology* (2012, '18, '19), *Journal of Interdisciplinary History* (2009), *Journal of Popular Music* (2006)

Book Referee Reader for books by W.W. Norton (2010, '12, '15), Ashgate (2013), Cambridge University Press (2014), and Routledge (2016, '19).

Conference Review for *International Symposium for Music Information Retrieval* (2011, '12, '13, '14, '18), *International Conference on Music and Mathematics* (2013, '15), *Sound, Music, and Computing conference* (2013)

Orchestral Boards

Boston Symphony Orchestra, Committee on Media and Technology (2014–18).

Alumni Board of the Bach Society Orchestra, executive board (2017–).

Scholarly Boards

American Academy in Rome, Society of Fellows Council (2014–17), SOF Vice President (2016–17).

DIAMM (Digital Image Archive of Medieval Music), member, Board of Directors (2010–15; Advisory Board 2007–10, Technical Advisor, 2017–).

SIMSSA, Single Interface for Music Score Searching and Analysis, Advisory Board (2011–14)

Digital Fauvel Project, Dept. of Computer Science, Princeton, Advisory Board (2013)

Scholar-in-Residence, the Broken Consort (thebrokenconsort.com) (2012–15)

Josquin Research Project, Advisory Board: http://jrp.ccarh.org/ (2011–14)

Centro Studi sull'Ars Nova Italiana del Trecento, member of the Advisory Board (2007–).

Conferences Organized

3rd Classical Music Hackathon, Cambridge, MIT (2016), with Matthias Röder.

AMS-New England/Northeast Conference on Music Theory, MIT (2016), first joint meeting, with Emily Richmond Pollock and Elina G. Hamilton

2nd Classical Music Hackathon/European Forum for Digital Musicology symposium, Munich (2013), with Vladimir Viro.

AMS-New England, MIT (2012), Winter meeting.

City, Chant, and the Topography of Early Music, Harvard University (2009), with Christoph Wolff and Sean Gallagher.

Progressions, Regressions, and Digressions, Harvard University (2003), graduate conference. with Jeannie Guerrero, chaired paper selection.

Guest Professor, Fondazione Cini, "John Dunstaple (ca. 1390–1453): English polyphony in fifteenth-century Italy," lecture topic: "Temperament, Intonation, and Tuning: Some issues in Theory and Practice," 22 May 2009.

Grant Reviewer for the Israel Science Foundation (2021, Binational fund '15), National Science Foundation (NSF) (2012), National Endowment for the Humanities (NEH) (2011, '12, '16), and Deutsche Forschungsgemeinschaft (DFG) ('12)

Mentor for Hawaii Tech Mentors (https://www.hawaiitechmentors.org) assisting develop technology positions for younger and mid-career entrants into the technology community in Hawaii and remotely.

Developer of www.college-costs.com website for comparing college prices across different levels of income and standardized test percentiles (2016). Speaker on college admission practices, Orange Glen High School (Escondido, Calif.), 2016.

Society for American Baseball Research (SABR) Arts Journal, music editor (2016–17).

PROJECTS AND FACULTY SERVICE

Projects

Digital Humanities Lab: Director (2017–19), Faculty Director (2019–20)

Music21 Research Lab: run a software development laboratory at M.I.T. creating new tools for music analysis and musicology research, supported by major research grants from the Seaver Institute and the National Endowment for the Humanities/Digging into Data Research Challenge (see below). (2006–present)

EMMSAP: Electronic Medieval Music Score Archive Project, Principal Investigator. project to create searchable digital versions of all fourteenth-century musical pieces and fragments. Supervise and coordinate four independent scholar/contractors on a budget of $24,000 (2012–2022)

Current Faculty Service

Associate Head for Music, MIT Music *&* Theater Arts (2023–)

Institute Implementation Committee: Music Technology (2022–)

Faculty Search Committee, co-chair, joint with the Schwarzman College of Computing (2022–)

Mechanical Engineering Faculty Search Committee, co-chair (2022–)

Music Curriculum Committee (2008–, *except* '14–15, '21-22), chair ('17, '19–20, 23–)

Undergraduate Academic Officer (2010–15, 21, 23)

Faculty Mentor for Assistant/Associate Professor (2014–23)

Equal Opportunity Officer, search for Greek Lecturer (2023)

Past Service

Tenure and Promotion Committees x 5 (latest 2023)

Ad-Hoc School of Engineering/SHASS Committee on Music Technology (2021–22)

MIT Online Committee (2021–22)

Faculty Director of Digital Humanities, SHASS (2017–21)

MITx Faculty Advisory Committee (2016–22)

Music Major Advisor (2010–15, 21)

Faculty Search Committees x 4 (2012, 2013, 2014, 2019)

Study Group on the Choice of Major (2017–19)

J-WEL (World Education Lab), featured speaker (2018)

SHASS Digital Humanities Working Group (2016–17)
Library IIIF Image Digitization Project (2016–17)
Library Committee, Lewis Music Library, (2007–14, 15–16; chair 2009–14, 15–16)
Working Group on Computation and Algorithmic Thinking (2016–17)
McDermott Residency Committee (2014–2016)
Subcommittee on the Humanities, Arts and Social Sciences (HASS) Requirement
 (2014–15)
SHASS Digital Learning Group: Committee on MITx and digital education (2012–13)
De Florez Humor Committee: oversee projects and funding relating to humor on campus
 (2014–15)
SHASS Education Advisory Committee: Committee on undergraduate education in the School
of Humanities, Arts, and Social Sciences (2011–12; 13–14)
Oral History Project Committee M.I.T. Lewis Library (2010–14)
MISTI-GSF Germany Fund grant committee (2012)
Technology Committee M.I.T. Music and Theater Arts section (2008–12)
Bang-on-a-Can Residency Committee (2010–2012)
MIT Wind Ensemble mid-concert lecture demonstration about Gordon Jacob's
 William Byrd Suite (2012 Spring)
Austin Kelly Essay Prize reader (2009)

COMPUTATIONAL SKILLS

Languages: Released numerous high usage open-source and proprietary pages in Python,
 TypeScript / JavaScript. Prior major experience with Perl. Experience with C/C++, Java, and
 PHP.
Frameworks and Systems: Django, Drupal, Apache
SysOps: Unix and BSD systems, Amazon Web Services EC2
Databases: MySQL and related technologies (AWS RDS)
Algorithms: Developer of efficient algorithms for music theory; released new interfaces for
 common algorithms in Python (e.g. heapclass pip library)
Other Technologies: Containerization (Docker, etc.), Jupyter, numpy, PyTorch, Tensorflow,
 scikit-learn.

RELATED SKILLS

Composer: Compositions in a variety of media. Selected works include *Vasarely Patterns* for the
Bang on a Can All-Stars (2002), *Two Etudes for Solo Viola* (2001; violin version 1999 rev. 2005),
and *in this cold winter* for string quartet (1998). Teachers include Mario Davidovsky, Judith Weir,
and Michael Gandolfi.
Languages: Italian (lived and studied in Italy 3 years plus 2 semesters), German (1 college
semester, 8 secondary school), French (2 semesters, primarily reading) and Latin (2 semesters).
Performer: Clarinet (including A♭ sopranino, E♭, and bass).
Font Designer: medieval music and clarinet fingering fonts released on-line and have appeared in
several publications. Co-chair for the W3C Standard Music Font Layout (SMuFL)
Conductor: Toscanini Chamber Orchestra (40 members), Harvard University, *1995–96*.

REFERENCES

Thomas Forrest Kelly
Morton B. Knafel Professor of Music,
 Emeritus
Department of Music
Harvard University
Cambridge, MA 02138
ph: 617-495-2791
e: tkelly@fas.harvard.edu

Rebecca Fiebrink
Reader (Associate/Full Prof. equivalent)
Department of Computing
Goldsmiths, University of London
& Creative Computing Institute, UAL
e: r.fiebrink@arts.ac.uk

Rob C. Wegman
Associate Professor of Music
Princeton University
Princeton, NJ 08544
ph: 609-258-4248
e: rwegman@princeton.edu

Ellen T. Harris
Class of 1949 Professor Emerita, M.I.T.
4-243 Music and Theater Arts
77 Massachusetts Ave.
Cambridge, MA 02139
ph: 617-253-3210
e: eharris@mit.edu

Phillip Kirlin
Associate Professor of Computer Science
Rhodes College
Briggs Hall
2000 North Parkway
Memphis, TN 38112
ph: 901-843-3725
e: kirlinp@rhodes.edu

Margaret Bent, CBE
Emeritus Fellow
All Souls College
University of Oxford
Oxford OX1 4AL, United Kingdom
ph: +44 1865 279379
e: Margaret.bent@all-souls.ox.ac.uk