TIMOTHY RAJA DE REUSE – CURRICULUM VITAE

timothy.dereuse@mail.mcgill.ca // github.com/timothydereuse
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I am a researcher in the field of Music Information Retrieval, working on machine-learning methods for retrieval tasks on symbolic music, and am particularly interested in tasks relating to motivic analysis or long-term musical repetition. I am passionate about direct collaboration with musicians and music researchers, bridging the difficult gap between MIR-based tools and actual applications in the hands of those who have the most interesting questions to ask of them.

EDUCATION

Doctor of Philosophy in Music Technology
Fall 2018 – Present McGill University (Montréal, QC)
- Advisor: Prof. Ichiro Fujinaga | Expected graduation in Spring 2024
- Researching error detection and correction in symbolic music using machine learning, with applications in Automatic Music Transcription and Optical Music Recognition
- Dissertation: "What's Wrong with This Music? Detecting Errors in Optical Music Recognition Output using Machine Learning"

Master of Arts in Music Technology
Fall 2016 – Summer 2018 McGill University (Montréal, QC)
- Advisor: Prof. Ichiro Fujinaga
- Thesis: "A machine learning approach to pattern discovery in symbolic music"

Non-Degree-Seeking Student
Fall 2014 – Summer 2016 University of North Texas (Denton, TX)
- Coursework in Computer Graphics, Numerical Methods, Physical Modeling

Bachelor of Arts in Mathematics, *cum laude*
Fall 2010 – Fall 2014 University of North Texas (Denton, TX)
- Concentrations in Topology and Complex Analysis
- Minor in Spanish

RESEARCH & PROJECTS

Musical Pattern Discovery on Jazz Saxophone Solos
Spring 2021 – Spring 2022
- Collaborating with jazz saxophonist Jonathan Orland on developing algorithms for pattern discovery in saxophone solos
- Computational analysis of the motivic styles of Charlie Parker and Lee Konitz
- Presented "Computational Methods Applied to Motivic Analyses of Jazz Improvisation" at the CIRMMT-OICRM-BRAMS Annual Student Symposium, May 24, 2022

Analyzing LGBTQ+ user tags on Last.FM
Fall 2019 | For the Schulich School of Music's Queer History Month Event
- Prepared and presented "What's a 'Gay Anthem?' Analyzing LGBTQ+ user tags and listening habits," a project investigating correlations between Last.fm user tags and LGBTQ-related keywords

Error Detection and Correction in Symbolic Music using Transformer Networks
Spring 2019 – Present | Towards Ph.D. in Music Technology

- Developing machine-learning methods capable of automatic detecting and correcting errors introduced into musical scores by other processes (e.g. through optical music recognition or audio-to-score transcription)
- Using transformer networks to leverage long-term structural information in music towards identification of structural irregularities.

Optical Music Recognition (OMR) on Medieval Chant Manuscripts
Fall 2018 – Present | As SIMSSA Research Assistant

- SIMSSA is the Single Interface for Music Score Searching and Analysis project, focusing on the processing of scanned historical music documents into searchable archives of symbolic music
- Developing methods for associating musical content with lyrical content in medieval chant manuscripts as part of SIMSSA's end-to-end OMR workflow
- Developing a job for SIMSSA's workflow manager, Rodan, for encoding OMR results into archival-ready files using the Music Encoding Initiative standard

Machine Learning and Musical Pattern Discovery
Fall 2017 – Fall 2019 | Towards M.A. in Music Technology

- Training a neural network to replicate human judgment as to which musical patterns are significant or insignificant, in a given musicological context

Graph-based Models of Traffic Flow
Fall 2014 – Fall 2016 | As CERL research assistant

- CERL is the Computational Epidemiology Research Laboratory at UNT. CERL analyzes U.S. demographic and geographic data to provide estimates and guidelines on resource allocation to local governments in case of large-scale threats to public health
- Built models to simulate traffic flow during health emergencies
- Wrote algorithms to find optimal plans for dispensation of emergency supplies over North American road networks

WORK EXPERIENCE

DDMAL Lab Manager (ddmal.music.mcgill.ca)
Fall 2021 – Present | McGill University

- Managing a lab of containing graduate students and undergraduate interns developing OMR software, music databases, and notation editors within an agile development framework
- Managing between 5-15 people (depending on the semester)
- Leading scrum meetings, organizing priorities, generally keeping things on track

Lecturer: Music and the Internet
Fall 2021, Fall 2022 | McGill University

- Lecturing on the History of the internet, streaming services, audio formats, music information retrieval, music databased and APIs, related topics. Taught simple programming and web development skills (Git / HTML / CSS / Javascript / AJAX) to students with limited technical backgrounds.

Grader / Instructional Assistant: Music and Audio Computing 1
Spring 2018 | McGill University

- Covering Max/MSP, Digital filters, Audio effects

SIMSSA Casual Research Assistant (simssa.ca)
Fall 2017 – Present | McGill University
- Maintaining a Docker-based web app for machine learning-based optical music recognition

Grader / Instructional Assistant: Computer Graphics
Spring 2016 | University of North Texas
- Covering OpenGL, C++, Linear Algebra

CERL Research Assistant (cerl.unt.edu)
Fall 2014 – Fall 2016 | University of North Texas
- Working on a Java-based GIS application for developing emergency response plans using census and road network data

GRANTS & AWARDS

CIRMMT Student Award
Spring 2021 – Summer 2022 | $9,000 CAD | Competitive grant
- Awarded by Center for Interdisciplinary Research in Music and Media Technology
- For project "Computational Methods Applied to Motivic Analyses of Jazz Improvization"
- Received jointly with saxophonist Jonathan Orland

Bourse au doctorat en recherche [*Doctoral Research Scholarship*]
Fall 2020 – Fall 2023 | $70,000 CAD | Competitive grant
- Awarded by the Fonds de Recherche du Québec – Société et culture

CIRMMT Travel Award
Fall 2019 | $1,000 CAD | Competitive grant
- Awarded by Center for Interdisciplinary Research in Music and Media Technology
- For presenting research at the 20th International Society of Information Music Retrieval Conference in Delft, Netherlands

Graduate Dean's Award Scholarship
Fall 2016 – Spring 2018 | $20,000 CAD
- Awarded by the Schulich School of Music, McGill University

PUBLICATIONS

de Reuse, Timothy and Ichiro Fujinaga. 2022. "A Transformer-Based "Spellchecker" for Detecting Errors in OMR Output." In *Proceedings of the International Society for Music Information Retrieval Conference*. Bengaluru, India.

deGroot-Maggetti, Jacob, **Timothy de Reuse**, Laurent Feisthauer, Samuel Howes, Yaolong Ju, Suzuka Kokubu, Sylvain Margot, Néstor Nápoles López, and Finn Upham, 2020. "Data Quality Matters: Iterative Corrections on a Corpus of Mendelssohn String Quartets and Implications for MIR Analysis." In *Proceedings of the 21st International Society for Music Information Retrieval Conference*. Montréal, Canada.

de Reuse, Timothy, and Ichiro Fujinaga. 2019. "Pattern Clustering in Monophonic Music by Learning a Non-Linear Embedding from Human Annotations." In *Proceedings of the 20th International Society for Music Information Retrieval Conference*. Delft, Netherlands.

de Reuse, Timothy, and Ichiro Fujinaga. 2019. "Robust Transcript Alignment on Medieval Chant Manuscripts." In *Proceedings of the 2nd International Workshop on Reading Music Systems*. Delft, Netherlands.

de Reuse, Timothy. 2019. "A Machine Learning Approach to Pattern Discovery in Symbolic Music." Master's Thesis, Montréal, Canada: McGill University.

SKILLS

Technical

- Python for Machine Learning and Data Analysis (Numpy, PyTorch, Keras, scikit-learn, Matplotlib)
- Docker and Docker Swarm for deploying full-stack web applications
- Proficient with LaTeX, MATLAB, JavaScript, Java, PostgreSQL
- Strong math background: Complex analysis, Fourier analysis, digital signal processing

Music and Audio

- FL Studio, Reaper, Audacity for audio editing, recording, and production
- SuperCollider and Max/MSP for algorithmic composition and audio processing
- Jazz and rock guitarist with experience performing solo and in various groups

Interpersonal:

- Years of experience collaborating as a programmer with music theorists, musicologists, and music librarians, communicating musical and technical concepts between diverse audiences
- Grading, tutoring in mathematics and computer science at a college level
- Scrum coach directing undergraduate interns on development of a full-stack web app

MUSIC & PRODUCTION

H (Bus Stop), dir. Matti Reißig (vimeo.com/124028177)
2014 Original score and sound design

- Short Film, 21'.

Hāl – Chahārgāh, Composed by Daniel Sabzghabaei (danielsabzghabaei.com/hal-chahargah)
2014 Audio editing and mixing

- Solo Violin, 10'

Doubt, dir. Andrew Harris (danielsabzghabaei.com/doubt)
2014 Audio editing and mixing

- Play
- Edited and mixed original score by Daniel Sabzghabaei

The Lady Revealed, dir. Andrew Harris (danielsabzghabaei.com/the-lady-revealed)
2013 Audio editing and mixing

- Play
- Edited and mixed original score by Daniel Sabzghabaei

Discography (Self-released as Water Gun Water Gun Sky Attack, except where noted)
Jul. 2022 *Total Swarm for Young Men* (LP) – 48'

Sept 2019	*Gay Joke* (LP) - 52’
April 2016	*Glow City* (LP) - 61’
June 2014	*I Don't Know What You're Worried About* (LP) - 50’
June 2013	*Let* (LP) - 65’
Sept. 2012	*Trouble Sleeping?* (LP) on SectionZ Records - 44’
March 2012	*Slew* (LP) - 56’
Oct. 2011	*Decompose* (EP, with A Problem Like Maria) - 29’
Oct. 2011	*Electromagnetics Will Tear Us Apart* (EP) – 25’