Timothy de Reuse – Curriculum Vitae

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Experienced Music Information Retrieval researcher with a strong background in machine learning, data science, and signal processing. Passionate about developing innovative software solutions for musicians and musicologists, with a focus on practical applications of research.

Education

Doctor of Philosophy in Music Technology 2018.08 – 2024.03

McGill University (Montréal, Québec)

- Advisor: Prof. Ichiro Fujinaga
- Dissertation: "Detecting Errors in Optical Music Recognition Output using Machine Learning"

Master of Arts in Music Technology 2016.08 – 2018.08

McGill University

- Advisor: Prof. Ichiro Fujinaga
- Thesis: "A Machine Learning Approach to Pattern Discovery in Symbolic Music"

Non-Degree-Seeking Student 2014.08 – 2016.06

University of North Texas (Denton, Texas)

- Coursework in Computer Graphics, Numerical Methods, Physical Modeling

Bachelor of Arts in Mathematics, *cum laude* 2010.08 – 2014.08

University of North Texas

- Concentrations in Topology and Complex Analysis
- Minor in Spanish

Research & Projects

Deep Learning-based Error Detection in Symbolic Music 2019.05 – 2024.02

Research conducted towards Ph.D. in Music Technology

- Created a method for "spell-checking" musical scores using Transformer networks, capable of reducing the time necessary to correct Optical Music Recognition outputs by 30%
- Developed novel methods of representing differences between musical scores, tailored to the task of error analysis

Efficient Machine Learning for Percussion Transcription 2021.08 – 2023.02

- Developed low-resource percussion transcription methods now used by several experimental musicians
- Used audio embeddings and k-nearest neighbors for fast drum sample classification

Musical Pattern Discovery on Jazz Saxophone Solos 2021.02 – 2022.05

- Collaborated with jazz saxophonist Jonathan Orland on developing algorithms for pattern discovery in jazz solos
- Developed a pattern discovery system capable of differentiating improvisatory styles of jazz soloists with high confidence

Analyzing LGBTQ+ user tags on Last.FM 2019.05 – 2019.09

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

Machine Learning and Musical Pattern Discovery 2017.07 – 2019.11

Research conducted towards M.A. in Music Technology

- ❑ Trained a neural network to replicate human judgment as to which musical patterns are significant or insignificant in a given musicological context, with 90% accuracy

Work Experience

DDMAL Lab Manager (ddmal.music.mcgill.ca) 2021.04 – Present

McGill University

- ❑ Managed a lab of containing graduate students and undergraduate interns developing OMR software, music databases, and notation editors within an agile development framework
- ❑ Coordinated development and deployment a Dockerized web app for deep learning-based optical music recognition, used internationally by music archivists and musicologists.
- ❑ Managed between 5-14 people (depending on semester)

Lecturer: Music and the Internet Fall 2021, Fall 2022

McGill University

- ❑ Developed and lectured undergraduate course about the history of music and the internet, music streaming, audio formats, and MIR.
- ❑ Taught programming and web development skills (Git, HTML, CSS, AJAX) to music students.

Grader / Instructional Assistant: Music and Audio Computing I Spring 2018

McGill University

- ❑ Tutored for class on digital filters, audio effects, signal processing, Max/MSP

SIMSSA Casual Research Assistant (simssa.ca) 2017.08 – 2021.04

McGill University

- ❑ Managed backend operations and network configuration to support a number of web-based musicological applications.
- ❑ Developed methods for associating music with lyrical content in medieval chant manuscripts as part of an end-to-end OMR workflow

Grader / Instructional Assistant: Computer Graphics Spring 2016

University of North Texas

- ❑ Tutored and graded for class on OpenGL, Linear Algebra, C++

CERL Research Assistant (cerl.unt.edu) 2014.08 – 2016.08

University of North Texas

- ❑ Wrote queueing model-based algorithms to find optimal plans for dispensation of emergency supplies over North American road networks
- ❑ Developed, with a small team, a Java-based GIS application for disaster response planning and traffic forecasting

Skills

Technical:

- Python for Machine Learning and Data Analysis: PyTorch, Keras, scikit-learn, librosa
- C++ for Digital Signal Processing: Synthesis Toolkit, VST SDK
- Background in Mathematics: Time-frequency representations, Fourier analysis, signal processing, numerical methods
- Others: OpenStack, Ansible, Nginx, Java, PostgreSQL, MATLAB, LaTeX

Music and Audio:

- FL Studio, Logic, Audacity for audio editing, recording, and production
- SuperCollider and Max/MSP for algorithmic composition and audio processing
- Jazz and rock guitarist, performer, composer

Language:

- English (Mother Tongue)
- French (B2 – Intermediate-Advanced)

Grants & Awards

CIRMMT Student Award (www.cirmmt.org) | $9,000 CAD 2021.04 – 2022.07

Competitive grant

- For project "Computational Methods Applied to Motivic Analyses of Jazz Improvisation"
- Received jointly with saxophonist Jonathan Orland

Bourse au Doctorat en Recherche | $70,000 CAD 2020.04 – 2023.11

Competitive grant

- Awarded by the Fonds de Recherche du Québec – Société et culture

CIRMMT Travel Award | $1,000 CAD 2019.11

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 | $20,000 CAD 2016.08 – 2018.05

- 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 22nd 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.

Music & Production

H (Bus Stop), dir. Matti Reißig (vimeo.com/124028177)

2014 Original score and sound design

- Short Film, 21'.

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'