Max Henry

maxhenrymusic.com
github.com/maxsolomonhenry

Email: max.henry@mail.mcgill.ca
Mobile: (514) 826-2845

Research Interests

Human-computer interaction, computer-assisted creativity, audio machine learning, and realtime interactive systems. Particular focus on designing AI-augmented tools for early stage creative ideation and divergent thinking in design. Informed by experience as award-winning composer, session musician and international touring artist.

Education

McGill University — Montreal, Quebec

M.Sc. Electrical and Computer Engineering (part-time during full-time employment) — *2025*

- Thesis: *A Realtime Suggestion Engine for Computer-Assisted Sound Design*
- Supervisor: Jeremy R. Cooperstock
- Developed an autoencoder-based AI assistant that learns from expert-designed synthesizer presets to provide realtime suggestions through low-dimensional embedding space, improving user performance by 0.89 standard deviations in sound-matching tasks.
- GPA: 4.0

M.A. Music Research, Music Technology Area — *2021*

- Thesis: *Dismantling the Illusion of Amplitude Modulation-Induced Vibrato*
- Supervisors: Stephen McAdams and Philippe Depalle
- Conducted psychoacoustic research at the Music Perception and Cognition Laboratory (MPCL), investigating perceptual dimensions of amplitude modulation on pitch percept
- Recipient of Outstanding Teaching Assistant Award (2021)
- GPA: 4.0

B.Mus. Jazz Piano Performance — *2018*

Publications & Patents

Total citations: 267 h-index: 5

Peer-Reviewed Conference Workshop Papers

Turian, J.*, & **Henry, M.*** (2020). "I'm sorry for your loss: Spectrally-based audio distances are bad at pitch." *ICBINB Workshop at Conference on Neural Information Processing Systems **(NeurIPS 2020)***. arXiv preprint arXiv:2012.04572. ***(48 citations)*** *Equal contribution.

Peer-Reviewed Conference Papers

Marino, D., Dai, J., Fortin, P. E., **Henry, M.**, & Cooperstock, J. (2024). "Co-Here: An expressive videoconferencing module for implicit affective interaction." *Proceedings of the 50th Graphics Interface Conference*, 1–13.

Marino, D., **Henry, M.**, Fortin, P. E., Bhayana, R., & Cooperstock, J. (2023). "I see what you're hearing: Facilitating the effect of environment on perceived emotion while teleconferencing." *Proceedings of the ACM on Human-Computer Interaction*, 7(CSCW1), 1–15.

Lee, H., Jiang, R., Yoo, Y., **Henry, M.**, & Cooperstock, J. R. (2022). "The sound of hallucinations: Toward a more convincing emulation of internalized voices." *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*, 1–12.

Turian, J., Shier, J., Khan, H. R., Raj, B., Schuller, B. W., Steinmetz, C. J., Malloy, C., Tzanetakis, G., Velarde, G., McNally, K., **Henry, M.**, et al. (2022). "HEAR 2021: Holistic evaluation of audio representations." *Proceedings of Machine Learning Research*, NeurIPS 2021 Competitions and Demonstrations Track, 125–145. ***(149 citations)***

Turian, J., Shier, J., Tzanetakis, G., McNally, K., & **Henry, M.** (2021). "One billion audio sounds from GPU-enabled modular synthesis." *Proceedings of the 24th International Conference on Digital Audio Effects (DAFx)*, 222–229. ***(39 citations)***

Journal Articles

Henry, M., Wanderley, M., & Cooperstock, J. (2025). "A realtime suggestion engine for computer-assisted sound design." *Computer Music Journal* (under review).

Noble, J., Thoret, E., **Henry, M.**, & McAdams, S. (2020). "Semantic dimensions of sound mass music: An exploration of mappings between perceptual and acoustic domains." *Music Perception: An Interdisciplinary Journal*, 38(2), 214–242. *(10 citations)*

Patent Applications

Lee, H., Jiang, R., Cooperstock, J. R., **Henry, M.**, & Ducher, C. (2024). "Voice parameter determination methods, system and device." U.S. Patent Application 18/310,213.

Marino, D. G., **Henry, M.**, Fortin, P., & Cooperstock, J. (2024). "System and method for displaying reaction animations." U.S. Patent Application 18/463,799.

Theses

Henry, M. (2025). *Novel Interfaces for Audio Manipulation.* Master's thesis, McGill University, Montreal, Canada.

Henry, M. (2021). *Dismantling the Illusion of Amplitude Modulation-Induced Vibrato.* Master's thesis, McGill University, Montreal, Canada.

Research Experience

Shared Reality Lab, McGill University — Montreal, Quebec

Graduate Researcher — *2021 – 2025*

- Conducted research on computer-assisted sound design, developing and validating an autoencoder-based realtime suggestion system for synthesizer parameter exploration through mixed-methods user study under supervision of Jeremy Cooperstock.
- Primary editor and reviewer for our lab theses and publications, providing structural feedback and copy editing before supervisor review.
- Contributed audio processing and analysis methods to projects published at ACM CSCW, Graphics Interface, and CHI, including realtime environmental sound identification and PCA-based speaker embedding design.

Music Perception and Cognition Lab, McGill University — Montreal, Quebec

Graduate Researcher — *2019 – 2021*

- Conducted psychoacoustic research on amplitude modulation and vibrato perception under supervision of Stephen McAdams and Philippe Depalle.
- Designed and executed formal listening experiments investigating perceptual dimensions of sound.
- Contributed to research on semantic dimensions of sound mass music, published in *Music Perception*.

Professional Experience

EERS Global Technologies — Montreal, Quebec

Product Owner: MR Communications — *2024 – Present*

- Lead participatory design and brainstorming sessions with stakeholders including MR technologists, radiologists, patients, and engineers to develop product vision for novel MRI communication system.
- Facilitate collaborative design thinking workshops to generate user stories, define requirements, and prioritize features based on clinical workflow analysis.
- Conduct user research through interviews and contextual inquiry with MR technologists and patients to ensure system meets real-world clinical needs.
- Translate user needs into technical requirements in coordination with regulatory consultants for multi-market compliance.

Audio R&D Scientist — *2021 – Present*

- Lead research and development initiatives for in-ear communication systems.
- Developed novel acoustic simulation platform for modelling multi-microphone system interactions.
- Implemented and optimized DSP algorithms including ANC, acoustic echo cancellation, and signal denoising from research literature.
- Coordinated technical integration and user requirements gathering for MRI communication system, working directly with MR technologists and patients.

Technical Skills

Programming & Tools

- **Languages:** Python, C++, MATLAB
- **Machine Learning:** PyTorch, Audio Representation Learning, Feature Extraction
- **Audio/DSP:** JUCE, Max/MSP, Pure Data, Realtime Systems
- **Development:** Git, Docker, Google Cloud Services, LaTeX

Research Methods

- **HCI:** User Studies, Requirements Analysis, Design Thinking, Iterative Design
- **Audio:** Psychoacoustics, Listening Tests, Perceptual Evaluation
- **ML:** Autoencoders, Representation Learning, Realtime Inference
- **Writing:** Technical Writing, Copy Editing

Awards & Honours

McGill University / CIRMMT — Montreal, Quebec
Academic Excellence — *2019 – 2021*

- Outstanding Teaching Assistant Award, 2021
- Best Presentation, CIRMMT-OICRM-BRAMS Student Symposium, 2021
- CIRMMT Student Award, Interdisciplinary Research Project, 2019

Various Organizations — International
Technical & Creative Recognition — *2013 – 2020*

- Silver Award, MATLAB Student Plugin Competition for Stutter+Hold, 2020
- Invited Guest Composer, Studio Stekker Festival (Utrecht, Netherlands), 2016
- SOCAN Young Composers Award, Original Score: Documentary, 2015

Teaching Experience

McGill University — Montreal, Quebec
Teaching Assistant (Musicology: Popular Music after 1945) — *2019 – 2021*

- Recipient of Outstanding Teaching Assistant Award (Graduate Instructor category), 2021

Technical Projects

Timbral Tremolo Effect Pedal: Embedded Audio Processing

- Designed and implemented realtime phase-vocoder-based audio effect on memory- and compute-limited embedded platform (Daisy Seed, ARM Cortex-M7).
- Optimized FFT processing using CMSIS libraries for realtime performance with custom hardware controls and OLED display feedback.
- Investigated perceptual effects of spectral modulation versus traditional amplitude modulation.

Additional Experience

SUUNS — International
Producer / Sound Designer / Synthesist — *2007 – 2019*

- International touring musician with 500+ performances across 41 countries, providing extensive experience in live audio production and realtime sound design.
- Licensed music to major media including "13 Reasons Why" and Nike commercial campaigns.

Session Musician & Composer — Canada
Keyboards, Production, Original Composition — *2008 – 2019*

- Session keyboardist and composer for Canadian productions; performed on Patrick Watson's "Wooden Arms" (certified Gold in Canada).
- Composed original scores for television including "The Secret World of Gold" (CBC) and "En Thérapie" (44 episodes).