Cameron Roberts

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I am a technologist and musician researching how the collision of music and computing can reimagine a learner's relationship with both domains and open new opportunities for creative self-expression.

Education

2023 – 2028 *(anticipated)* **| Northwestern University**
PhD in Computer Science and Learning Science, Cognitive Science Specialization
Advanced Cognitive Science Fellowship (2024)

2021 – 2023 | Chicago College of Performing Arts, Roosevelt University
Masters of Music Performance
Dean's Award Scholarship (2021)

2016 – 2020 | Northwestern University
Bachelors of Music Performance and Computer Science
A. Brooke Overby Scholarship (2019)
Northwestern Alumni Association Club Scholarship (2018)
QuestBridge Scholar Network (2016)

Publications

Roberts, C. & Horn, M. (under review). "Computational Thinking and Epistemic Heterogeneity: A Critical Review of Music+Coding." *Transactions of Computing Education*.

Roberts, C., Fasiang, K., O'Rourke, E., & Horn, M. (under review). "Scaffolding the Creative Process in Music with Tinkerable Generative AI." *Proceedings of Interaction, Design, and Children (IDC'25)*.

Roberts, C., Sherin, B., & Horn, M. (under review). "From Sound to Code: Creative Workflows and Problem-Solving in Music + Coding Tasks." *Proceedings of the International Society of the Learning Sciences (ICLS'25)*.

West, M., Horn, M., **Roberts, C.**, & Ecford, O. (2025). "Observing Joy: An Observation Protocol to Assess Joyful Learning in STEAM Classrooms." *Proceedings of the American Educational Research Association (AERA) 2025 Annual Meeting,* Denver, CO.

Roberts, C. & Horn, M. (2024). "Computational Musicking: Music + Coding as a Hybrid Practice." *Behaviour & Information Technology*, 1–21.

Roberts, C. & Horn, M. (2023). "When Literacies Collide: The Role of Translation in Music + Coding Activities." *ACM Symposium on Learning, Design, and Technology*, June 23, Chicago, IL.

Horn, M., West, M., **Roberts, C.** (2022). *Introduction to Digital Music with Python Programming: Learning Music with Code*. United States: Taylor & Francis.

Teaching Experience and Curriculum Development

2024 | Intro to Design for the Learning Sciences (graduate), Northwestern University
Teaching Assistant

2024 | Intro to Computer Programming (undergraduate), Northwestern University
Curriculum Development

2023 – present | Evanston District 65
Curriculum Development, Teacher Support
Developed and supported implementation of a 12-week curriculum for over 500 fifth-grade students in Evanston School District 65.

2021 – 2022 | Coded Beats Afterschool Program
Curriculum Development, Teacher Support
Led team that developed a 10-week curriculum for afterschool music+coding clubs utilized by hundreds of Chicagoland middle and high school students.

2021 | Music and The Movement
Curriculum Development, Professional Development
Co-developed curriculum for teaching music and coding through drum circles and TunePad, in partnership with Evanston YMCA makerspace.

2020 – 2021 | Chicago Youth Centers, Teen Beat Making Club
Lead Instructor, Curriculum Development
Mentored youth and led weekly sessions teaching Python code and music theory, using EarSketch and TunePad, in partnership with Chicago Youth Centers.

Work Experience and Research

2023 – present | Software Developer, Hearing R&D, GN Group
Developed full-stack researcher-facing data collection platform for collecting real-time Ecological Momentary Assessment (EMA) data in order to support evaluation of hearing aids.

2020 – 2023 | Post-Bac Scholar, TIDAL Lab, Northwestern University
Software developer and researcher for TunePad, an NSF-funded project to teach Python coding and music production skills through a rich music+coding environment. Contributed key software features such as a community platform with social feed, sheet music generation tool, and chords module.

2019 | Power Systems R&D Intern, S&C Electric Company
Developed full-stack monitoring system for a hardware-in-the-loop testing bed of smart switches with a central server and React-based interface to visualize device state and overall power flow.

Projects

MusicLOGO 2.0 | link | designed and implemented music+coding programming environment built with ReactJS and Firebase

TunePad Community | link | designed and prototyped social platform for learners to share musical compositions; led team to expand functionality of platform

Music Blox | demo | designed and prototyped spatialized digital musical instrument installation built with Python and OpenCV

Accordia | more | designed, fabricated, and performed with digital musical instrument built with an Arduino and Max/MSP

algoRhythm | more | led team to develop automated rhythmic evaluation system with Python and Librosa

Invited Talks and Presentations

- Dolby Future of Learning Summit (2025)
- TechTogether Hackathon, "Computational Creativity & Data Sonification" (2022)

Professional Activities

Memberships

- Association for Computing Machinery (ACM)
- American Educational Research Association (AERA)
- International Society of the Learning Sciences (ISLS)

Ad Hoc Reviewer

- Computer Supported Collaborative Learning (CSCL)
- International Conference of the Learning Sciences (ICLS)
- ACM Conference on Human Factors in Computing Systems (CHI)
- International Journal of Child-Computer Interaction
- Routledge/Focal Press
- Sound Studies Review (SSR)

Selected Performances

***( )hole complex* Album Release** | International Museum of Surgical Science | 2.7.2024
Immersive experience at the edge of concert, installation, and meditation, with duo Garden Unit (saxophone/clarinet) and new electronic interventions performed live by the composer.

Frequency Series | Constellation Chicago | 3.05.2023
Premiered new works with Garden Unit by three of Chicago's leading emerging composers.

New Music Chicago Presents | Experimental Sound Studio | 9.20.2022
Featured artist with Garden Unit on monthly concert series curated by New Music Chicago.

Thirsty Ears Festival 2022 | Access Contemporary Music | 8.13.2022
Featured artist with Garden Unit, presenting program including world premiere of work by George Papajohn at Chicago's only classical music street festival.

NASA Biennial Conference | Corbett Auditorium, Cincinnati Conservatory | 3.10.2018
Featured performance at the North American Saxophone Alliance Biennial Conference with the Northwestern University Saxophone Ensemble, directed by Taimur Sullivan.

Technical Skills

Programming Languages: Python, JavaScript/TypeScript, Dart, C#, Swift, Lisp, HTML/CSS
Packages and Frameworks: Flask, Django, ReactJS, Firebase, Numpy/Scipy, OpenCV, SQLAlchemy
Other Tools: Git, Arduino, Max/MSP, Ableton