Charles D. Roberts, PhD

Associate Professor

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Prior Academic Appointments

2015-2018 *Assistant Professor*, School of Interactive Games & Media, Rochester Institute of Technology

2014-2015 *Postdoctoral Fellow*, University of California at Santa Barbara

2000-2004 *Course Director*, Expression College of Digital Arts

Education

2014 PhD in Media Arts & Technology, University of California at Santa Barbara

2009 MA in Media Arts & Technology, University of California at Santa Barbara

2005 MA in Instructional Technologies, Columbia University, NY

1997 BM in Music, James Madison University, VA

Scholarship

My scholarship primarily takes three forms: traditional academic peer-reviewed publications, live audiovisual performances (often peer-reviewed at international conferences), and the design and development of open-source software. This section also includes curated events and performances, which are opportunities for me, my colleagues, and my students to present research in a performative setting.

Authors are listed as they appear on the papers, typically determined by the comparative depth of research contributions. A $*$ denotes shared primary authorship. Students sharing authorship are denoted by underlining their name.

Publications

Journal Articles

J5 *Roberts, C.* Code as Information and Code as Spectacle. International Journal of Performance Arts and Digital Media. 12:2, pp.201–206. 2016.

J4 *Roberts, C.*, Allison, J., Holmes, D., Taylor, B., Wright, M. Educational Design of Live Coding Environments for the Browser. Journal of Music Technology & Education. 9:1, pp.95–116. 2016.

J3 *Roberts, C.*, Wakefield, G., Wright, M. Designing Musical Instruments for the Browser. Computer Music Journal. 39:1, pp.27–40. 2015.

J2 Kuchera-Morin, J., Wright, M., Wakefield, G., *Roberts, C.*, Höllerer, T., Adderton, D. Immersive, Full-Surround, Multi-User System Design. Computers *&* Graphics. 40:(1), pp.10–21, 2014

J1 Wakefield, G., Höllerer, T., Kuchera-Morin, J., *Roberts, C.*, Wright, M. Spatial Interaction in a Multi-User Immersive Instrument. Computer Graphics *&* Applications. pp.14–20. 2013.

Book Chapters

B2 *Roberts, C.*∗ and Wakefield, G∗. Tensions and Techniques in Live Coding Performance. In Dean, R., McLean, A. (eds.), Oxford Handbook of Algorithmic Music. Chapter 16. Oxford, UK : Oxford University Press. 2018.

B1 *Roberts, C.*, Wakefield, G., and Wright, M. The Web Browser as Synthesizer and Interface. In Jensenius, A.R., and Lyons, M. (eds.), A NIME Reader: Fifteen Years of New Interfaces for Musical Expression. Chapter 13, pp.433–450. Switzerland : Springer International Publishing. 2017.

Conference Proceedings (peer-reviewed)

Conferences are considered a primary venue for presenting research in computer science and various digital arts communities; I engage with both in my research. Although many conferences where I present research do not publish acceptance rates, I provide them below when available. The New Interfaces for Musical Expression conference is the most presitigious of the conference venues I regularly present at; it is the second-ranked conference for Music and Musicology by Google Scholar.

C31 *Roberts, C.*Screamer: A high-level language for live coding ray marchers. (to appear) Proceedings of the 2025 International Conference on Live Coding. 2025.

C30 *Roberts, C.*. Dynamic Per-Sample Processing with WebAssembly. Proceedings of the Web Audio Conference. Five pages. 2022.

C29 *Roberts, C.*, Hattwick, I., Sheffield, E., Smith, G. Rethinking Networked Collaboration in the Live Coding Environment Gibber. Proceedings of the New Interfaces for Musical Expression Conference. Twenty-one pages. 2022. Acceptance rate 37%.

C28 Zellerbach, Z., *Roberts, C.*. A Framework for the Design and Analysis of Mixed Reality Musical Instruments. Proceedings of the New Interfaces for Musical Expression Conference. Twenty pages. 2022. Acceptance rate 37%.

C27 *Roberts, C.* Live Coding Procedural Textures of Implicit Surfaces. Proceedings of the 2020 International Conference on Live Coding. Ten pages. 2020.

C26 *Roberts, C.*, Pachon-Puentes, M. Bringing the TidalCycles Mini-Language to the Browser. Proceedings of the Web Audio Conference. Five pages. 2019.

C25 *Roberts, C.* Live Coding Ray Marchers with Marching.js. Proceedings of the International Conference on Live Coding. Seven pages. 2019.

C24 *Roberts, C.* Realtime Annotations and Visualizations in Live Coding Performance. Proceedings of the LIVE Programming Workshop, part of the ACM SIGPLAN SPLASH Conference. Interactive Web Essay. http://charlieroberts.github.io/annotationsAndVisualizations/. 2018. Acceptance rate 45%.

C23 *Roberts, C.* Metaprogramming Strategies for AudioWorklets. Proceedings of the Web Audio Conference. Six pages. 2018.

C22 *Roberts, C.* Strategies for Per-Sample Processing of Audio Graphs in the Browser. Proceedings of the Web Audio Conference. Six pages. Best Presentation Award. 2017.

C21 *Roberts, C.*∗, Wakefield, G.∗ gibberwocky: New Live-Coding Instruments for Musical Performance. Proceedings of the New Interfaces for Musical Expression Conference. pp.121–126. 2017. Acceptance rate 24%.

C20 Wakefield, G., *Roberts, C.* A Virtual Machine for Live Coding Language Design. Proceedings of the New Interfaces for Musical Expression Conference. pp.275–278. 2017. Acceptance rate 24%.

C19 *Roberts, C.*∗, Wakefield, G.∗ Live Coding the Digital Audio Workstation. Proceedings of the International Conference on Live Coding (ICLC). Six pages. 2016.

C18 *Roberts, C.*, Wright, M., Kuchera-Morin, J. Musical Programming in Gibber. Proceedings of the International Computer Music Conference (ICMC), pp.50–57. 2015. Acceptance rate (long paper) 33%.

C17 *Roberts, C.*, Yerkes, K., Wright, M., Kuchera-Morin, J. Sharing Time and Code in a Browser-Based Live-Coding Environment. Proceedings of the International Conference on Live Coding (ICLC). pp.179–185. 2015.

C16 *Roberts, C.* Wright, M., Kuchera-Morin, J. Beyond Editing: Extended Interaction with Textual Code Fragments. Proceedings of the New Interfaces for Musical Expression Conference (NIME), pp.126–131. 2015. Acceptance rate 12%.

C15 Wan Rosli, H.M., Yerkes, K., Wood, T., Wolfe, H., *Roberts, C.*, Haron, A., Estrada, F. Wright, M. Ensemble Feedback Instruments. Proceedings of the New Interfaces for Musical Expression Conference (NIME), pp.144–149. 2015. Acceptance rate 12%.

C14 *Roberts, C.*, Wright, M., Kuchera-Morin, J., Höllerer, T. Gibber: Abstractions for Creative Multimodal Programming. Proceedings of the 2014 ACM Multimedia Conference, pp.67–76. 2014. Acceptance rate 19%.

C13 *Roberts, C.* Sound-Light Giblet. Proceedings of the ACM Multimedia Conference,pp.699–700. 2014.

C12 *Roberts, C.*, Wright, M., Kuchera-Morin, J., Höllerer, T. Rapid Creation and Publication of Digital Musical Instruments. Proceedings of the New Interfaces for Musical Expression conference (NIME), pp.239–242. London, 2014. 2014. Acceptance rate 23%.

C11 Wakefield, G., *Roberts, C.*, Wright, M., Wood, T., Yerkes, K. Collaborative Live-Coding with an Immersive Instrument. Proceedings of the New Interfaces for Musical Expression conference (NIME), pp.505–508. London, 2014. 2014. Acceptance rate 23%.

C10 *Roberts, C.*, Wakefield, G., Wright, M. The Web Browser as Synthesizer and Interface. In Proceedings of the New Interfaces for Musical Expression conference (NIME), pp.313–318. Korea Republic. Best Paper Award. 2013.

C9 *Roberts, C.*, Forbes, A., Höllerer, T. Enabling Multimodal Mobile Interfaces for Musical Performance. In Proceedings of the New Interfaces for Musical Expression conference (NIME), pp.102–105. Korea Republic. 2013.

C8 *Roberts, C.*, Kuchera-Morin, J. Gibber: Live Coding Audio In The Browser. In Proceedings of the International Computer Music Conference (ICMC), pp.64–69. Ljubljana, Slovenia. 2012.

C7 *Roberts, C.*, Wakefield, G., Wright, M. Mobile Controls On-The-Fly: An Abstraction for Distributed NIMEs. In Proceedings of the New Interfaces for Musical Expression (NIME), pp.474–478. Ann Harbor, Michigan. 2012.

C6 *Roberts, C.*, Alper, B., Kuchera-Morin, J., and Höllerer, T. Augmented Textual Data Viewing in 3D Visualizations Using Tablets. Proceedings of the Symposium on 3D User Interfaces (3DUI), IEEE Virtual Reality Conference, pp.101–104. 2012.

C5 *Roberts, C.*, Höllerer, T. Composition For Conductor And Audience: New Uses for Mobile Devices in the Concert Hall. Proceedings of the ACM User Interface Software And Technology Conference (UIST), pp.65–66 (poster). Santa Barbara, CA. 2011. Acceptance rate (poster) 41%.

C4 *Roberts*, C. Control: Software for End-User Interface Programming and Interactive Performance. Proceedings of the International Computer Music Conference (ICMC), pp.425–428. 2011.

C3 *Roberts, C.*, Wright, M., Kuchera-Morin, J., Putnam, L. and Wakefield G. Dynamic Interactivity Inside the AlloSphere. Proceedings of the New Instruments for Musical Expression Conference (NIME), pp.57–62. 2010. Acceptance rate 50%.

C2 Wakefield, G., Smith, W. and *Roberts, C.* LuaAV: Extensibility and Heterogeneity for Audiovisual Computing. Proceedings of the Linux Audio Conference (LAC). Eight pages. 2010.

C1 Kuchera-Morin, J., Höllerer, T., Bell, B., Mangiat, S., Putnam, L. and *Roberts, C.* Towards a General-purpose Infrastructure for Novel Collaborative Multimodal Human-Computer Interfaces. Proceedings of the Workshop on Media Arts, Science, and Technology (MAST). Three pages. 2009.

Performances

Performances are an important part of my scholarship; they both drive much of my research and provide another context to present it in. At times, my research can be difficult to fully convey in an oral presentation. By performing with my research output I can both improve understanding of my research and encourage others to potentially engage with it. Below I divide my performances into juried performances—which are usually single-blind peer reviewed—and invited / non-juried performances. Juried performances at some digital arts conferences are often very competitive (see P10 and P9), although they typically don't publish acceptance rates. While informal non-juried and invited performances are not peer reviewed, they are still important for engaging audiences that do not attend academic conferences or other formal performance venues. Performances listed here only include those in which I use technology I research and develop; traditional instrumental performances are not listed. For juried performances I am often required to give the performances a name; for non-juried / invited performances this is not required.

Juried Performances

P20 *Untitled*, a live-coding performance using Screamer. International Conference on Live Coding. Barcelona, Span. 2025.

P19 *Untitled Improvisation*, a duo live-coding performance using Gibber. With Gillian Smith. Web Audio Conference. Cannes, France. 2022.

P18 *Untitled*, a solo live-coding performance using Gibber. International Conference on Live Coding. Limerick, Ireland. 2020.

P17 *Cyclic Gibbering*, a solo live-coding performance using Gibber. Web Audio Conference. Trondheim, Norway. 2019.

P16 *Untitled Gibberings*, a solo live-coding performance using Gibber. International Conference on Live Coding. Madrid, Spain. 2019.

P15 *Improvisation*, a solo live-coding performance using Gibber. Web Audio Conference. Berlin, Germany. 2018.

P14 *Frabjous Day*, a solo live-coding performance using gibberwocky. Web Audio Conference. London, United Kingdom. 2017.

P13 *Resting By the Tumtum Tree*, a solo live-coding performance using gibberwocky. New Interfaces for Musical Expression Conference. Copenhagen, Denmark.(acceptance rate 31%). 2017.

P12 *Improvisation*, a solo live-coding performance using Gibber. International Conference on Live Coding. Hamilton, Ontario. 2016.

P11 *Improvisation*, a solo live-coding performance using Gibber. Web Audio Conference. Atlanta, GA. 2016.

P10 *Visual Gibberings*, a solo live-coding performance using Gibber. IEEE VIS Arts Program (VISAP). Chicago, IL. (acceptance rate 14%). 2015.

P9 *Blinky Gibberings*, a solo live-coding performance using Gibber. International Computer Music Conference. University of North Texas, TX. (acceptance rate 16%). 2015.

P8 *Gibberings and Mutterings*, a solo live-coding performance using Gibber. International Conference on Live Coding. University of Leeds, UK. 2015.

P7 *Blinky Gibberings*, a solo live-coding performance using Gibber. New Interfaces for Musical Expression Conference. Baton Rouge, LA. 2015.

P6 *Untitled*, a group performance exploring networked feedback. New Interfaces for Musical Expres-

sion Conference. Baton Rouge, LA. 2015.

P5 *Sound-Light Giblet*, a solo live-coding performance using Gibber. ACM Multimedia Interactive Arts Programme. Orlando, FL. 2014.

P4 *Untitled Algorave Performance*, a solo live-coding performance using Gibber. Live Coding and the Body Symposium. Brighton, UK. 2014.

P3 *Some Gibberish*, a solo live-coding performance using Gibber. New Interfaces for Musical Expression Conference. London, UK. 2014.

P2 *Untitled*, a solo live-coding performance using Gibber. Contours of Algorithmic Life Conference. University of California at Davis. 2014.

P1 *Untitled*, a solo live-coding performance using Gibber. New Interfaces for Musical Expression Conference. Daejeon, South Korea. 2013.

Non-Juried / Invited Performances

NJP29 Algorave. Live coding performances using Screamer and Gibber, in two 30' sets. Worcester, MA. 2024.

NJP28 Instruments, Interfaces, Infrastructures Workshop @ Harvard. Live coding performance with the MIT Laptop Ensemble, 30'. Boston, MA. 2023.

NJP27 Beautiful Machines Algorave. Duo live coding performance with Dr. Gillian Smith, 30'. Boston, MA. October 12th, 2022.

NJP26 Flashcrash. Solo live coding performance with Gibber, 30'. Online. February 5, 2022.

NJP25 The Longest Night Solstice Festival. Solo live coding performance with Gibber, 20'. Online. December 12th, 2022.

NJP24 Transnodal festival of live coding. Duo live coding performance with Dr. Gillian Smith, 30'. Online. February 20th, 2021.

NJP23 Northampton Center for the Arts. Solo live coding performance, 30'. Northampton, MA. April 6th, 2019.

NJP22 Algorithmic Art Assembly. Solo live coding performance, 30'. San Francisco, CA. March 22nd, 2019.

NJP21 Eyebeam. Duo live coding performance with Ulysses Popple, 30'. Brooklyn, NY. Invited by Dr. Kate Sicchio. April 11th, 2018.

NJP20 Rochester Fringe Festival. Solo live coding performance, 30'. Rochester, NY. September 17th, 2017.

NJP19 First Thursday Art Crawl. Solo live coding performance, 30'. Santa Barbara, CA. August 3rd, 2017.

NJP18 Imagine RIT Festival. Solo live coding performance, 30'. Rochester, NY. May 6th, 2017.

NJP17 Rochester Fringe Festival. Solo live coding performance, 30'. Rochester, NY. September 16th, 2016.

NJP16 Babycastles Algorave. Solo live coding performance, 30'. Manhattan, NY. September 11th, 2016.

NJP15 Imagine RIT Festival. Solo live coding performance, 30'. Rochester, NY. May 7th, 2016.

NJP14 Center for Computer Research in Music and Acoustics Spring Concert. Solo live coding performance, 15'. Stanford University. Invited by Dr. Matthew Wright. March 11th, 2016.

NJP13 Algorave. Solo live coding performance, 30'. Troy, NY. Invited by Dr. Shawn Lawson. November 20th, 2015.

NJP12 ACADIA (Association for Computer-Aided Design in Architecture) Conference. Solo live coding

performance, 60'. Los Angeles, CA. Invited by Jose Sanchez. October 26, 2014.

NJP11 Center for Research in Electronic Art Technology (CREATE) Fall Concert, "Sound Storm". Live coding performance with the CREATE Ensemble. Santa Barbara, CA. November 20th, 2013.

NJP10 Media Arts & Technology Program Spring Show. Solo live coding performance, 15'. Santa Barbara, CA. May 23rd, 2013.

NJP11 Center for Research in Electronic Art Technology (CREATE) Fall Concert, "Sound Paths". Live coding performance with the CREATE Ensemble. Santa Barbara, CA. November 20th, 2012.

NJP8 Santa Barbara New Music Series. Trio live coding performance with Dr. Matthew Wright and Dr. Karl Yerkes, 30'. Santa Barbara, CA. Invited by Colter Frazier. August 9th, 2012.

NJP7 Media Arts & Technology Program Spring Show "Bits and Pieces". Solo live coding performance, 15'. Santa Barbara, CA. May 29th, 2012.

NJP6 Center for Research in Electronic Art Technology (CREATE) Fall Concert, "π and Beyond". Live coding performance with the CREATE Ensemble, 15'. Santa Barbara, CA. November 15th, 2012..

NJP5 Media Arts & Technology Program Spring Show "Questionable Utility". Solo performance of *Composition for Conductor & Audience*, conducting audience members on their cellphones, as described in [C5]. Santa Barbara, CA. June 9th, 2011.

NJP4 Psychonautica. Duo electronic performanance with Dr. Karl Yerkes, 30'. Santa Barbara, CA. April 7th, 2011.

NJP3 Primavera Festival of New Music. Solo performance "Improvisation for liquids and electronics", 15'. Santa Barbara, CA. April 30th, 2010.

NJP2 Media Arts & Technology Program Spring Show "Something You Don't Know". Solo performance of *Improvisation for liquids and electronics*, 15'. Santa Barbara, CA. May 26th, 2010.

NJP1 Media Arts & Technology Program Spring Show "Everyone Wants Everything". Duo performance live coding music with Dr. Angus Forbes on drums and visuals, 10'. Santa Barbara, CA. June 8th, 2009.

Open Source Software Contributions

An important facet of my research is creating software that is used by others to generate creative output. For over a decade, I have released all non-trivial software I have written as open-source; I both actively develop such software and attempt to foster community around it. The most successful of these projects, the live-coding environment *Gibber*, has been used in courses at over thirty colleges and universities, including prestigious universities such as MIT and Princeton. Metrics provided by GitHub, the hosting company for my software repositories, place the Gibber repo in the top 0.00012% of all repositories globally in terms of popularity. In the list below, I denote research publications and performances associated with each piece of software (when applicable) as well as the number of stars (likes) each repository has received.

Selected Personal Software Development

OS11 Screamer. Primary Developer. https://charlieroberts.github.io/screamer ⋆33 2024-*now*
Publications: [C31]
Performance: [NJP29, P20]
A streamlined live-coding language that builds on top of Marching.js[OS10].

OS10 Marching.js. Primary developer. http://charlie-roberts.com/marching ⋆201 2017-*now*
Publications: [C25, C27]
A graphics library and accompanying live-coding environment for experimenting with constructive solid geometry using ray marching techniques. Artists and performers have used marching.js to create gallery installations, lead workshops, and perform live.

OS9 Gibberwocky. Co-developer. http://github.com/charlieroberts/gibberwocky ⋆169 2016-*now*
Publications: [C19, C21]
Performances: [P13, P14, NJP19, NJP21]
A musical live coding environment that primarily works with the commercial music software Ableton Live and Max/MSP. The research concept behind gibberwocky was to attract electronic music creators to programming by giving them a coding environment to algorithmically control software they're already intimately familar with. I've personally used gibberwocky in a variety of performances; more recently it was used by noted electronic musician Deru to create his album *We Will Live On*.

OS8 Genish.js. Primary developer. http://charlie-roberts.com/genish ⋆111 2016-*now*
Publications: [C22, C23, C20]
Genish is the low-level DSP engine that drives many of my projects. It uses code generation techniques to create optimized JavaScript and/or WebAssembly representations of audio signal graphs. In addition to being integral to both Gibber (OS5) and Gibberish (OS6), genish has also been used in classes at Australian National University and MIT.

OS7 Gibber. Primary designer and developer. http://gibber.cc ⋆848 2012-*now*
Publications: [J3, J4, J5, C8, C10, C12, C13, C14, C16, C17, C18, C24, C26, C29]
Performances: [NJP12–NJP19, NJP22–NJP27, P1–P12, P15–P19]
Gibber is the primary vehicle for my research and performance practice. In addition, I've written with collaboraters on how Gibber is used in education (J4) and in networked ensemble performance (C29). Educators have used Gibber in over thirty universities, ranging from community colleges to R1 research institutions; it has also been used in a variety of after-school workshops and summer camp programs.

OS6 Interface.js. Primary developer. http://charlie-roberts.com/interface ⋆211 2012-*now*
Publications: [B1, J3, C10, C12]
I created this software to make it simple to design interfaces for mobile devices to control software for audiovisual performance.

OS5 Gibberish.js. Primary developer. http://charlie-roberts.com/gibberish ⋆378 2012-*now*
Publications:[B1, J3, C10, C18, C20, C22, C23]
Gibberish provides high-level musical instruments, audio effects, and sequencing abstractions for use in the browser. It builds on top of genish.js (OS9) to form the musical backbone of Gibber (OS8).

OS4 Control. Primary developer. http://charlie-roberts.com/Control ⋆166 2010–2013
Publications: [J1, J2, C4, C5, C6, C7, C9]
Performances: [NJP4, NJP5, NJP8]
Control was native software for both iOS and Android devices that enabled users to create their

own interfaces for remotely controlling audiovisual software. While it is no longer maintained, when available it was downloaded over fifty-thousand times, and received popular press coverage.

OS3 Stereo. Co-creator. https://github.com/CreativeCodingLab/stereo ⋆50
This software enables programmers to use stereoscopic rendering within the popular Processing creative coding environment. 2011.

OS2 DeviceServer. Primary developer. 2009–2014
Publications: [J1, J2, C1, C3]
The DeviceServer powered interactivity in the Allosphere Research Facility. It abstracts interaction away from application developers, so that interaction can be freely configured on the fly depending on who is using a particular application and what devices they want to use to control it.

OS1 midiStroke. Primary developer. http://charlie-roberts.com/midiStroke ⋆116 2005–2019
A simple utility for translate MIDI (Musical Instrument Digital Interface) messages into key presses, enabling remote control of desktop applications from electronic music interfaces. midiStroke has been downloaded tens of thousands of times since I released it in 2005, and it still receives hundreds of downloads monthly.

Selected Software Development from the Realtime Expressive Programming Lab

In addition to the software that I personally develop, students I direct in the Realtime Expressive Programming Lab (REPL) at WPI have also made a number of notable open source software contributions. In the list below I denote the thesis, major qualifying project, or independent study that each project came from at the end of each entry, along with the current number of GitHub stars.

REPL8 Apiary by Bailey Sostek. https://github.com/baileysostek/Apiary 2022–2023
Apiary is an environment for creating GPU-accelerated agent-based simulations. To the best of our knowledge, it is the only programming environment that enables this using a single high-level programming language. [MT8].

REPL7 Necode by Trevor Paley. https://necode.org 2021–*now*
Necode is a networked programming environment for social coding activities that has been used in multiple classes at WPI. [MT7, MQP9].

REPL6 post5 by Cole Granof. https://github.com/bandaloo/post5 ⋆40 2022 post5 is a graphical post-processing library for p5.js, a popular creative coding framework. [MT5]

REPL5 Unreal Engine 4 Speech-To-Text by Jian Liu. https://github.com/Vakarian15/UE4-Google-Speech-to-Text-Plugin ⋆9 2021
This plugin integrates Google's APIs for cloud-based speech recognition into the popular game engine Unreal. [MT3]

REPL4 Unreal Engine 4 Ray Marching by Kai Yan. https://github.com/aceyan/UE4_RayMarchingPlugin ⋆24 2021

This plugin eases experimentation with constructive solid geometry and experimental graphics techniques by bringing ray marching to the popular game engine Unreal. [MT3]

REPL3 Barbara by Karitta Zellerbach. https://barbara.graphics ⋆19
2021 Barbara is a live coding environment for experimenting with programming language design. Kit presented Barbara at the 2020 Hybrid Live Coding Interfaces Workshop. [IS5]

REPL2 p5.Polar by Liz Peng. https://github.com/liz-peng/p5.Polar ⋆46
2020 p5.Polar is a libary for easily experimenting with graphics rendered using polar coordinates for p5.js. It is a featured p5.js library. [MT1]

REPL1 PHAD by Mariana Pachon-Puentes, Benjamin Anderson, Norman Delorey, and Henry Frishman https://mqp-live-coding-language-design.github.io/mqp/ 2020
PHAD is a musical live coding environment that runs in the browser, enabling easy sequencing of musical patterns. [MQP2]

Curated Events and Performances

I organize performance events as opportunities for myself, colleagues, and students to present research on digital performance practice to the public. Performances in Worcester have featured internationally renowned live coders, WPI faculty members, MQP groups performing with their projects, students performing as part of independent studies, and performers from the greater New England area, RPI, and MIT.

CP7 Algorave. Worcester PopUp. Worcester, MA. Featuring myself and Dr. Gillian Smith performing as "Chith" from WPI, Computational Media PhD student Darren Cole, WPI faculty members Rodney DuPlessis and Scott Barton, and faculty from MIT. 2024.

CP6 Beautiful Machines Algorave. Boston, MA. Featuring myself and Dr. Gillian Smith performing as "Chith" from WPI, Computational Media PhD student Darren Cole, and other performers from MIT, Berklee, and the greater New England area. 2022.

CP5 TOPLAP Transnodal Festival (New England Node). Online. Featuring myself and Dr. Gillian Smith performing as "Chith" from WPI, WPI student Kit Zellerbach [MT6] performing with Barbara [REPL3], and other performers from MIT and New England. 2021.

CP4 Worcester Algorave II. Worcester Polytechnic Institute. Worcester, MA. Featuring myself and Dr. Gillian Smith performing as "Chith" from WPI, Dr. Scott Barton from WPI, five WPI students (Mariana Pachon-Puentes, Benjamin Anderson, Norman Delorey, and Henry Frishman using PHAD [REPL1], plus Kit Zellerbach using Barbara [REPL3] and other performers from across New England. 2019.

CP3 Algorave I. Worcester PopUp. Worcester, MA. Featuring myself and Dr. Gillian Smith performing as "Chith" from WPI, and performers from New England, New York, and the United Kingdom. 2018.

CP2 Experimental Aesthetics Series. Rochester, NY. Two performances in downtown Rochester featuring RIT faculty and students. 2016–2017.

CP1 Algorave. Santa Barbara, CA. The first Algorave held in the United States, featuring students from

a class on live coding I taught along with guest performers. 2015.

Teaching

Courses Taught

In this section are lists of courses from the two institutions I have taught at since completing my PhD.

Courses at WPI

I have taught twenty courses at WPI. Five sections were graduate courses (course numbers 5000 or greater), fourteen sections were upper-division undergraduate courses with some graduate students (4000 level or higher, and CS/IMGD 420X), and one section was an entirely undergraduate course (CS 3041 HCI). At WPI, undergraduate courses are taught in terms, which are approximately one half of a semester in length. Graduate courses (5000-level or higher) are taught over full semesters.

Term	Course	Size
2024 Fall	IMGD 5100: Tangible & Embodied Interaction	24
2024 A-term	CS 4241: Webware	78
2024 D-term	IMGD 4000: Technical Game Development II	24
2023 A-term	CS 4241: Webware	77
2023 A-term	IMGD 4099: Graphics, Simulation, and Aesthetics	21
2023 A-term	IMGD 4030: Advanced Interactive Audio	10
2023 D-term	IMGD 4000: Technical Game Development II	25
2022 A-term	CS 4241: Webware	101
2022 Fall	IMGD 5099: ST: Live Coding & Creative Practice	8
2022 Fall	IMGD 5100: Tangible & Embodied Interaction	18
2022 C-term	CS/IMGD 420X: Graphical Simulation of Physical Systems	20
2021 A-term	CS 4241: Webware	100
2021 D-term	IMGD 4000: Technical Game Development II	18
2021 Fall	IMGD 5100: Tangible & Embodied Interaction	12
2020 A-term	CS 4241: Webware	105
2020 D-term	IMGD 4000: Technical Game Development II	21
2020 C-term	CS/IMGD 420X: Graphical Simulation of Physical Systems	12
2019 A-term	CS 4241: Webware	100
2019 Spring	IMGD 5100: Immersive Human-Computer Interaction	26
2018 B-term	CS 3041: Human-Computer Interaction	60

Courses at RIT

I taught six different classes at RIT. One was a special topics course that I created coupling the history of 20th century abstraction in art with technical discussions of algorithms and audiovisual techniques used in the digital arts. Other classes focused on web development and human-computer interaction.

Term	Course	Size
2018 Spring	IGME 590: Special Topics in Aesthetic Computation	10
2017 Fall	IGME 330: Rich Media Web Application Development	10
2017 Spring	IGME 590: Special Topics in Aesthetic Computation	10
2016 Fall	IGME 239: Web Design & Implementation Tangible	28
2016 Spring	IGME 590: Special Topics in Aesthetic Computation	17
2015 Fall	IGME 236: Interaction, Immersion, and the Media Interface	23

Research Grants

G4 Soundscape authoring. Bose Corporation. PI. Total Budget: $15,000. 2019.

G3 *(not funded)* A Game-Based Visualization for Cybersecurity Situational Awareness. Laboratory for Analytic Sciences, North Carolina State University. PI: *Roberts, C.* with Stackpole, W., Wright, M. and Yang, S. Total budget: $50,000. 2018.

G2 Visualization in Live Coding Performance. Golisano College of Computing and Information Sciences Seed Funding, RIT. PI: *Roberts, C.* Total budget: $5,000. 2017.

G1 Visualization in Live Coding Performance. Sponsored Research Services, RIT. PI: *Roberts, C.* Total budget: $4,945. 2016.

Professional Presentations

Conference presentations without proceedings

CP4 Algoraves, Live Coding, and Education. New Media Consortium Conference. Rochester, NY. 2016.

CP3 Gibber. IEEE VIS Arts Programme. Chicago, IL. 2015.

CP2 Networked Collaboration with Gibber. Network Music Festival. Birmingham, UK. 2014.

CP1 Gibbering at Algoraves. jsConf.Asia, Singapore. 2014.

Invited Lectures and Workshops

IL22 Conflicts and compromise in web audio development. Massachusetts Institute of Technology. Invited by Dr. Ian Hattwick. 2022.

IL21 Live Coding in Gibber. Virginia Commonwealth University. Invited by Dr. Kate Sicchio. 2021.

IL20 Advanced Topics in Live Coding with Gibber. Massachusetts Institute of Technology. Invited by Dr. Ian Hattwick. 2021.

IL19 (ray)marching across cultures: bringing demoscene techniques to live coding performance. MAT Seminar Series. University of California at Santa Barbara. 2019.

IL18 Live Coding, the demoscene, and ray marching. University of California at Santa Cruz. Invited by

Dr. Angus Forbes. 2019.

IL17 Introduction to Gibber. Northampton Center for the Arts. Northampton, MA. 2018.

IL16 Live Coding and Algoraves. Massachusetts Institute of Technology. Invited by Dr. Ian Hattwick. 2018.

IL15 Gibberwocky. Princeton University. Invited by Dr. Jeff Snyder. 2017.

IL14 Design a Mini Live-Coding Language (peer-reviewed workshop with Dr. Graham Wakefield). New Interfaces for Musical Expression Conference. Copenhagen, Denmark. 2017.

Il13 Algoraves and Live Coding. Eastman School of Music. Rochester, New York. Invited by Dr. Oliver Schneller. 2017.

IL12 Design a Mini Live-Coding Language (peer-reviewed workshop with Dr. Graham Wakefield). International Conference on Live Coding. Hamilton, Canada. 2016.

IL11 Live Coding Performance: Algoraves, Programming, and New Conceptions of the Audience. Penn State Behrend. Invited by Dr. Joel Hunt. 2016.

IL10 Gibber: A Creative Coding *&* Performance Environment for Browsers. University of Michigan. Invited by Dr. Michael Gurevich. 2016.

IL9 Making Source Code Dance: Algorithmic Feedback in Live Coding Performance. York University. Invited by Dr. Graham Wakefield. 2016.

IL8 Making Source Code Dance: Visualizing Algorithms in Live Coding Performance. University of California at Santa Barbara. 2016.

IL7 Making Source Code Dance: Visualizing Algorithms in Live Coding Performance. Stanford University. Invited by Dr. Matthew Wright. 2016.

IL6 Live Coding with Gibber. Rensselaer Polytechnic Institute. Invited by Dr. Shawn Lawson. 2015.

IL5 Live Coding for Algoraves, Education, and Virtual Reality Environments. Colorado University Boulder. 2015.

IL4 Programming Abstractions for Creative Coding and Live Coding Performance. National University of Singapore. Invited by Dr. Lonce Wyse. 2014.

IL3 The Future of Web Technologies. University of Central Florida. 2014.

IL2 Live Coding with Gibber. Sogang University, Seoul, Korea. Invited by Dr. Haru Ji. 2013.

IL1 Musical Instruments for the Browser (peer-reviewed workshop). New Interfaces for Musical Expression Conference, Daejeon + Seoul, South Korea. 2013.

Service

Service to Profession

Program Committees

PC27 Program Committee, International Live Coding Conference. 2025.

PC26 Program Committee, IEEE VIS Arts Program. 2024.

PC25 Program Committee, Web Audio Conference. 2024.

PC24 Program Committee, International Live Coding Conference. 2024.

PC23 Program Committee, IEEE VIS Arts Program. 2023.

PC22 Program Committee, Web Audio Conference. 2022.

PC21 Program Committee, International Live Coding Conference. 2023.

PC20 Program Committee, IEEE VIS Arts Program. 2022.

PC19 Program Committee, Web Audio Conference. 2021.

PC18 Program Committee, International Live Coding Conference. 2020.

PC17 Program Committee, IEEE VIS Arts Program. 2020.

PC16 Program Committee, IEEE VIS Arts Program. 2019.

PC15 Program Committee, International Live Coding Conference. 2019.

PC14 Program Committee, Web Audio Conference. 2019.

PC13 Program Committee, IEEE VIS Arts Program. 2018.

PC12 Program Committee, Web Audio Conference. 2018.

PC11 Program Committee, IEEE VIS Arts Program. 2017.

PC10 Program Committee, Web Audio Conference. 2017.

PC9 Program Committee, International Live Coding Conference. 2016.

PC8 Program Committee, IEEE VIS Arts Program. 2016.

PC7 Program Committee, Web Audio Conference. 2016.

PC6 Program Committee, IEEE VIS Arts Program. 2015.

PC5 Program Committee, Web Audio Conference. 2015.

PC4 Program Committee, International Live Coding Conference. 2015.

PC3 Program Committee, IEEE VIS Arts Program. 2014.

PC2 Program Committee, International Computer Music Conference. 2012.

PC1 Program Committee, International Computer Music Conference. 2011.

Journal and Conference Reviewer

R24 External Reviewer, New Interfaces for Musical Expression Conference. 2024.

R23 External Reviewer, New Interfaces for Musical Expression Conference. 2023.

R22 External Reviewer, SIGGRAPH. 2023.

R21 External Reviewer, New Interfaces for Musical Expression Conference. 2023.

R20 External Reviewer, New Interfaces for Musical Expression Conference, 2022.

R19 External Reviewer, SIGGRAPH Arts Papers. 2022.

R18 External Reviewer, New Interfaces for Musical Expression Conference. 2021.

R17 External Reviewer, SIGGRAPH Arts Gallery. 2021.

R16 External Reviewer, SIGGRAPH Arts Papers. 2021.

R15 External Reviewer, SIGGRAPH. 2020.

R14 External Reviewer, New Interfaces for Musical Expression Conference. 2019

R13 External Reviewer, SIGGRAPH. 2019.

R12 Reviewer, Journal of New Music Research. 2019.

R11 External Reviewer, SIGGRAPH. 2018.

R10 External Reviewer, New Interfaces for Musical Expression Conference. 2018.

R9 External Reviewer, Ubimus Conference. 2018.

R8 External Reviewer, SIGGRAPH. 2017.

R7 External Reviewer, New Interfaces for Musical Expression Conference. 2017.

R6 External Reviewer, New Interfaces for Musical Expression Conference. 2016.

R5 External Reviewer, New Interfaces for Musical Expression Conference. 2015

R4 External Reviewer, Ubimus Conference. 2015.

R3 External Reviewer, Ubimus Conference. 2014.

R2 Reviewer, Computer Music Journal. 2014.

R1 Reviewer, Computer Music Journal. 2013.

Miscellaneous

MS1 Diversity Mentor for New Interfaces for Musical Expression Conference, 2021–2022

Department & University Service

DUS6 Diversity, Equitiy, and Inclusion Committee for Computer Science Department, WPI. 2022–*now*

DUS6 Graduate Committee for Interactive Media and Game Development Program, WPI. 2024–*now*

DUS5 Graduate Coordinator, Interactive Media and Game Development Program, WPI. 2020–*2024*
As graduate coordinator, I review all applications and make decisions about acceptance for each of the three IMGD graduate programs, soliciting additional feedback when needed; in a typical year this is between 50–75 applications, with 10–20 accepted students choosing to come to WPI. I also serve as a temporary advisor to all incoming graduate students in the summer before they arrive at WPI, coordinate a variety of events for graduate students throughout the year, and perform many other services.

DUS7 Member, Interactive Media & Game Development Program Search Committee, WPI. 2023

DUS4 Diversity Advocate, Interactive Media and Game Development Program, WPI. 2020–2021

DUS3 Member, Interactive Media and Game Development Graduate Committee, WPI. 2018–2019

DUS2 Member, New Media Interactive Development Curriculum Committee, RIT. 2016–2018

DUS1 Member, Interactive Games and Media Search Committee, RIT. 2016–2018