

## Curriculum Vitae

Matthew James Wright  
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### **Personal Information:**

Born: 24 August, 1971, Madison, WI  
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### **Education:**

2003-2008: Ph.D., Stanford University, Computer Based Music Theory and Acoustics (CCRMA). Dissertation title “The Shape of an Instant: Measuring and Modeling Perceptual Attack Time with Probability Density Functions.”  
1988-1993: B.A., University of California, Berkeley, double major Music and Computer Science

### **Employment:**

2015-present: Technical Director, Stanford Center for Computer Research in Music and Acoustics (CCRMA).  
2008-2015: Research Director, Center for Research in Electronic Art Technology (CREATE); Principal Development Engineer (Multimedia Systems) and Lead Engineer, AlloSphere Research Group; Associate Researcher III off scale; and Lecturer (Media Arts Technology Program and Music Department), U.C. Santa Barbara. Directing, collaborating, and facilitating research; interactive immersive sonification and visualization of complex data; facilitating collaboration with scientific and engineering domain experts from a variety of disciplines across the campus (including Physics, Materials Science, Computer Science, and Medicine); designing and engineering interactive audiovisual computation and display systems for the AlloSphere; coordinating the technical activities of the AlloSphere Research Group (faculty, staff, and graduate students); teaching classes including directing the CREATE Ensemble (hands-on practical approach to composition, improvisation, critique, refinement, and research dedicated to live performance) and the Afro-Brazilian Ensemble; overseeing the maintenance and continual upgrades of CREATE’s three state-of-the-art computer music studios; writing annual budget requests for CREATE and allocating funding for equipment and projects; managing the CREATE Technical Coordinator; advising students; committee service; and engaging in research collaborations.  
2007-2008: Postdoctoral Research Fellow, University of Victoria, BC, Canada. Computational Ethnomusicology (a novel research approach we defined and demonstrated during this year) and Music Information Retrieval research with Profs. George Tzanetakis and W. Andrew Schloss.  
1995-2008 (part time 2003-08 during Ph.D. study): Musical Systems Designer, U.C. Berkeley Center for New Music and Audio Technologies (CNMAT). Research staff member on a wide variety of projects (see publications for details), with duties including systems design and implementation, software design, implementation, maintenance, and documentation,

- all aspects of concert production, and (often collaborative) design of interactive musical systems to be used by myself and by other composers.
- 1994-95: Software programmer, Gibson Guitar Corporation Research and Development, on the team working to commercialize FAR (“Fourier Analysis and Resynthesis,” a sinusoidal-modeling analysis/synthesis system), ZIPI (“The ZIPI Instrumental Processor Interface,” a proposed successor to MIDI), and the Infinity Box (a stringed-instrument-to-ZIPI interface, consisting of articulation detection, fundamental frequency estimation, and timbral description).
- 1993-95: Lecturer, U.C. Berkeley Electrical Engineering and Computer Science Department, to teach Computer Science 3: *Introduction to Symbolic Programming*.
- 1993-94: Music and Computer Specialist, U.C. Berkeley Center for New Music and Audio Technologies and Zeta Music. Research on FAR, ZIPI, and the Infinity Box.

### **Grants:**

- Co-PI, DURIP (“Defense University Research Instrumentation Program”): A High-Fidelity Mixed Reality Simulator. Office of Naval Research, \$320,461, 6/15/2013 to 6/14/2014. With Tobias Höllerer.
- Co-PI, EAGER (“EARly-concept Grants for Exploratory Research”): A Computational Framework Integrating Methods from Music Composition and Sketching for Large Scale Scientific Data Visualizations in the 3D Immersive Allosphere. National Science Foundation, \$300k, 7/1/2010 to 7/31/2013. With JoAnn Kuchera-Morin.
- Co-PI, MRI (“Major Research Infrastructure”): Development of the Allosphere, an Immersive Instrument for Scientific Exploration. National Science Foundation, \$500k, 08/01/2008 to 07/31/2011. With Matthew Turk, Tobias Höllerer, and JoAnn Kuchera-Morin.

### **Teaching Experience:**

- 2008-15: Individual instruction in computer music principles, theory, and technologies, for UCSB grad students from Music Composition and from Media Arts Technology.
- 2010-15: Director, UCSB *CREATE Ensemble* (MAT 594CE), emphasizing experimental real-time arts performance with laptops and other technologies
- 2010-15: Director, UCSB Afro-Brazilian Ensemble (Music 70S/170S/270S), including *maracatu*, *samba batucada*, *samba enredo*, *samba afro*, *samba reggae*, *afoxê*, *baião*, *coco*, etc.
- 2012: UCSB MAT 594P “Composing Media Pieces for the AlloSphere”
- 2011-14: UCSB MAT 201B “Computing with Media Data”
- 2010-11: UCSB MAT 240A,B,C “Digital Audio Programming.” Overview of digital audio research (A), Spatial Sound (B), and Physical Interaction Design (C)
- 2010: Seminar on interactive multimedia processing in Max/MSP, UCSB.
- 2009-10: Music Director, *Santa Barbara Samba School Afro-Brazilian Percussion Ensemble*.
- 2008-2009: Computational Rhythm Processing Seminar, UCSB MAT.
- 2008: Guest lecture, U. Victoria *Machine Learning and Data Mining* course.
- 2005-2007: Director, Afghan orchestra, Sierra Music and Arts Institute (one-week intensive summer workshop). Taught Afghani classical, folkloric, and popular music (*klasik*, *mahali*, and *kiliwali*) via traditional oral methods and prepared a student ensemble for recital performance.
- 2005: Co-Instructor, CCRMA’s *Musical Interaction Design* Workshop, with Wendy Ju. Two-week course included mechanical engineering, sensors, circuits, AVR microprocessor

programming in “C”, Open Sound Control, Pd programming, basics of sound synthesis, psychoacoustics, and prototyping techniques.

2004-2007: Co-director, *Bateria Lucha* and *Maracatu Nação Cazadero* (Afro-Brazilian percussion ensembles in Oakland, CA), teaching technique, rhythm parts, and arrangements and occasionally leading performances.

2004-5: Teaching Assistant, Stanford University Music Department. Music 250a (*HCI theory and practice*) with Max Mathews and Bill Verplank, Music 220b (*Synthesis Techniques, Compositional Algorithms, Psychoacoustics and Spatial Processing*) with Fernando Lopez-Lezcano, and Music 8A (*Rock, Sex, and Rebellion*) with Mark Applebaum.

2002 and 2003: Co-Instructor, one-week summer workshops *Taller de modelos interactivos en audio y video* (“Workshop on interactive audio and video modeling”) at Centro Nacional para la Cultura y las Artes (CENART) in Mexico City, using Max/MSP/Jitter.

1998-2004: Lead instructor, *CNMAT Max/MSP Summer Workshop* (both the advanced lecture-style classes and the hands-on beginner/intermediate classes)

1997: Co-Instructor, *CNMAT Summer Workshop*. Focus on sinusoidal and resonance modeling (analysis and synthesis) and programming interactive real-time performance systems.

Fall 1993, Spring 1994, Spring 1995: Lecturer, U.C. Berkeley, Computer Science 3 (*Introduction to Symbolic Programming*), the department’s introductory-level computer science course). I taught about 170 students each semester, using the Scheme language and my own textbook *Simply Scheme*.

Summer 1992: Instructor, Institute for Secondary Mathematics and Computer Science Education (IFSMACSE), Kent State University. I taught (with Brian Harvey) a six-week *Advanced Computer Science* course to Ohio high school teachers, in the Logo programming language.

### **Honors and Awards:**

2014: Invited Speaker, CalArts Symposium for Computer Science in Arts Education (SCSAE).

2013: Invited speaker, UCSB International Center for Materials Research (ICMR) Summer School, “Visualization of large 3D datasets”

2007: Invited speaker, 2<sup>nd</sup> Symposium on Music, Rhythm and the Brain, Stanford University

2005: *Special Recognition for Excellent Work as a Teaching Assistant*, Stanford University Music Department

2003: Invited sarode performer, *Ali Akbar College of Music* concert series

2002: Invited vocalist, *Ali Akbar College of Music* concert series

2002: Invited speaker, Symposium on Sensing and Input for Media-Centric Systems (SIMS), U.C. Santa Barbara

1999: Invited speaker, CREATE, U.C. Santa Barbara

1998: *Distinguished Service Award*, U.C. Berkeley College of Letters & Science

### **Additional Musical Education:**

February 2007: *Corpos Percussivos* and *Maracatu Badia* (Afro-Brazilian *Maracatu* drumming): learned and performed in Brazilian Carnival (cities of Recife and Olinda) with two traditional drumming groups.

July 2006: One-week intensive workshop in Afghan rûbab and the traditional music of Afghanistan with Ustad Mohammed Rahim Khushnawaz.

2006-2007: *Grupo Samba Rio* (Afro-Brazilian samba drumming), ongoing student of master percussionist Jorge Alabê and member of his ensemble.

1997-2003: *Ali Akbar College* (North Indian classical): sarode and vocal student of Late Maestro Ali Akbar Khan.

1995-2014: California Brazil Camp, Lark in the Morning World Music and Dance Celebration, Middle Eastern Music and Dance Camp, and Sierra Music and Arts Institute (week-long summer music camps): student and later instructor, learning and teaching various acoustic musical traditions outside my own culture, including Turkish, Arabic, Armenian, Afghan, Brazilian, Algerian, Persian, and Greek.

### **Research Interests:**

Human perception and production of rhythm. Expressive timing. Interactive musical systems. Live performance and improvisation. Artificial listeners. Representation of musical material with high-level models. Human/Computer Interaction. Design of potentially expressive computer-based musical instruments. Cybernetics. Human motion in skilled performance. Mapping of physical gesture to musical control. Traditional musics of Brazil, North Africa, the Middle East, the Arab world, Afghanistan, and India. Computational ethnomusicology. Analysis/synthesis of musical sound via mutable representations. Machine learning. Sonification and Visualization. Spatial Sound.

### **Publications:<sup>1</sup>**

- Haron, Anis and Matthew Wright. 2015. Wave Voxel Synthesis. In *Proceedings of the 12th Sound and Music Computing Conference*, Maynooth, Ireland.
- Wan Rosli, Muhammad Hafiz, Andres Cabrera, Matthew Wright, and Curtis Roads. 2015. Granular Model of Multidimensional Spatial Sonification. In *Proceedings of the 12th Sound and Music Computing Conference*, Maynooth, Ireland.
- Roberts, Charlie, Karl Yerkes, Matthew Wright and JoAnn Kuchera-Morin. 2015. Sharing Time and Code in a Browser-Based Live Coding Environment. In *Proceedings of the First International Conference on Live Coding*. Leeds, UK.
- Roberts, Charlie, Jesse Allison, Ben Taylor, Daniel Holmes, Matthew Wright, JoAnn Kuchera-Morin. 2015. Educational Design of Live Coding Environments for the Browser. In *Journal of Music, Technology and Education* (special edition). In press.
- Piepenbrink, Andrew and Matthew Wright. 2015. The Bistable Resonator Cymbal: An Actuated Acoustic Instrument Displaying Physical Audio Effects. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Baton Rouge, LA.
- Roberts, Charles, Matthew Wright, and JoAnn Kuchera-Morin. 2015. Beyond Editing: Extended Interaction with Textual Code Fragments. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Baton Rouge, LA.
- Wan Rosli, Muhammad Hafiz, Karl Yerkes, Matthew Wright, Timothy Wood, Hannah Wolfe, Charlie Roberts, Anis Haron, and Fernando Rincón Estrada. 2015. Ensemble Feedback Instruments. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Baton Rouge, LA.
- Wu, Cecilia, Romain Michon, Jonathan Abel, Nathan Weitzner, and Matthew Wright. 2015. Tibetan Singing Prayer Wheel: A Hybrid Musical- Spiritual Instrument Using Gestural Control. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Baton Rouge, LA.

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<sup>1</sup> This list is in reverse chronological order, then by first author within each year.

- Roberts, Charles, Graham Wakefield, Matthew Wright, and JoAnn Kuchera-Morin. 2015. Designing Musical Instruments for the Browser. *Computer Music Journal*, 39:1, pp.27-40. Spring 2015.
- Roberts, Charles, Matthew Wright, JoAnn Kuchera-Morin, and Tobias Höllerer. 2014. Gibber: Abstractions for Creative Multimedia Programming. In *Proceedings of the ACM International Conference on Multimedia*. New York, NY, Pages 67-76.
- Roberts, Charles, Matthew Wright, JoAnn Kuchera-Morin, and Tobias Höllerer. 2014. Rapid Creation and Publication of Digital Musical Instruments. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. London, UK.
- Wakefield, Graham, Charlie Roberts, Matthew Wright, Timothy Wood, and Karl Yerkes. 2014. Collaborative Live-Coding Virtual Worlds with an Immersive Instrument. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. London, UK.
- Yerkes, Karl, and Matthew Wright. 2014. Twkyr: a Multitouch Waveform Looper. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. London, UK.
- Kuchera-Morin, JoAnn, Matthew Wright, Graham Wakefield, Charles Roberts, Dennis Adderton, Behzad Sajadi, and Aditi Majumder. 2014. Immersive full-surround multi-user system design. *Computers and Graphics*. Volume 40, May 2014, Pages 10–21. <http://dx.doi.org/10.1016/j.cag.2013.12.004>
- Wakefield, Graham, Tobias Höllerer, JoAnn Kuchera-Morin, Charles Roberts, and Matthew Wright. 2013. Spatial Interaction in a Multiuser Immersive Instrument. *IEEE Computer Graphics and Applications*. Nov/Dec Vol 33 No. 6. pp. 14-20.
- Han, Yoon Chung, Byeong-jun Han, and Matthew Wright. 2013. Digi Sonus: Advanced Interactive Fingerprint Sonification Using Visual Feature Analysis. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Daejeon and Seoul, Korea.
- Liu, Qian, Yoon Chung Han, JoAnn Kuchera-Morin, Matthew Wright, George Legrady. 2013. Cloud Bridge: a Data-driven Immersive Audio-Visual Software Interface. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Daejeon and Seoul, Korea.
- Roberts, Charles, Graham Wakefield, and Matthew Wright. 2013. The Web Browser As Synthesizer And Interface. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Daejeon and Seoul, Korea. (Won “best paper” award for NIME 2013.)
- Roberts, Charles, Graham Wakefield, and Matthew Wright. 2012. Mobile Controls On-The-Fly: An Abstraction for Distributed NIMEs. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Ann Arbor, Michigan.
- Shear, Greg, and Matthew Wright. 2012. Further Developments in the Electromagnetically Sustained Rhodes Piano. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Ann Arbor, Michigan.
- Wright, Matthew. 2011. A Scientific View of Musical Rhythm. In Jonathan Berger and Gabe Turow (eds.) *Music, Science, and the Rhythmic Brain*, New York: Routledge.
- McGee, Ryan and Matthew Wright. 2011. Sound Element Spatializer. In *Proceedings of the International Computer Music Conference*. Huddersfield, England.
- McGee, R., Jatila van der Veen, Matthew Wright, JoAnn Kuchera-Morin, Basak Alper, and Philip Lubin. 2011. Sonifying The Cosmic Microwave Background. In *Proceedings of the 17th International Conference on Auditory Display (ICAD-2011)*, Budapest, Hungary.
- Popp, Phillip and Matthew Wright. 2011. Intuitive Real-Time Control of Spectral Model Synthesis. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Oslo, Norway.

- Shear, Greg and Matthew Wright. 2011. The Electromagnetically Sustained Rhodes Piano. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Oslo, Norway.
- Wright, Matthew. 2010. Empirical Study of Melodic Shape and Data-Driven Statistical Methods for Scale Tone Derivation Applied to Qu'ran Recitation and Middle Eastern Song. Presented at Third Annual Middle East Studies Conference, October 7-9, 2010, CSU Fresno.
- Hochenbaum, Jordan, Ajay Kapur, and Matthew Wright. 2010. Multimodal Musician Recognition. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney, Australia.
- Roberts, Charles, Matthew Wright, JoAnn Kuchera-Morin, Lance Putnam, Graham Wakefield. 2010. Dynamic Interactivity Inside the AlloSphere. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney, Australia.
- Yerkes, Karl, Greg Shear, and Matthew Wright. 2010. Disky: a DIY Rotational Interface with Inherent Dynamics. In *Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney, Australia.
- Wright, Matthew, Matt Stabile. 2009. Spectrally Matched Click Synthesis. Proc. DAFx conference, Como, Italy.
- Biró, Dániel Péter, Steven Ness, W. Andrew Schloss, George Tzanetakis, Matthew Wright. 2008. Decoding the Song: Histogram-Based Paradigmatic and Syntagmatic Analysis of Melodic Formulae in Hungarian Laments, Torah Trope, Tenth Century Plainchant and Koran Recitation. Presented at the *Prosody of Expressivity in Music and Speech* workshop at IRCAM, Paris, France.
- Ness, Steven, Matthew Wright, L. Gustavo Martins, George Tzanetakis. 2008. Chants and Orcas: Semi-automatic Tools for Audio Annotation and Analysis in Niche Domains. *1st International Workshop on Robust Multimedia Learning in Broad Domains* (in conjunction with ACM Multimedia 2008), Vancouver, BC, Canada.
- Wright, Matthew, W. Andrew Schloss, George Tzanetakis. 2008. New Tools for Visualizing Musical Timing. Abstract only, presented at the 53rd Annual Meeting of the Society for Ethnomusicology (SEM), Wesleyan University, Middletown, CT.
- Wright, Matthew. 2008. *The Shape of an Instant: Measuring and Modeling Perceptual Attack Time with Probability Density Functions (If a Tree Falls in the Forest, When Did 57 People Hear it Make a Sound?)* Ph.D. Dissertation, Stanford University (<http://ccrma.stanford.edu/~matt/diss>).
- Wright, Matthew, W. Andrew Schloss, George Tzanetakis. 2008. Visualization Tools for Musical Timing Applied to Afro-Cuban Percussion. In *Proceedings of the International Computer Music Conference*. Belfast.
- Wright, Matthew, W. Andrew Schloss, George Tzanetakis. 2008. Analyzing Afro-Cuban Rhythm Using Rotation-Aware Clave Template Matching with Dynamic Programming. In *Proceedings of the International Conference on Music Information Retrieval (ISMIR)*. Pittsburg, PA.
- Jensenius, A. R., A. Camurri, N. Castagné, E. Maestre, J. Malloch, D. McGilvray, D. Schwarz, M. Wright. 2007. Panel: The Need of Formats for Streaming and Storing Music-Related Movement and Gesture Data. In *Proceedings of the International Computer Music Conference*, Vol 2: 13-16. Copenhagen.
- Schmeder, Andrew, Matthew Wright, Adrian Freed, Edmund Campion, and David Wessel. 2007. CNMAT Information Infrastructure. In *Proceedings of the International Computer Music Conference*, Vol 1: 325-328. Copenhagen.

- Tzanetakis, George, Ajay Kapur, W. Andrew Schloss, and Matthew Wright. 2007. Computational Ethnomusicology. *Journal of Interdisciplinary Music Studies* 1, no. 2: 1-24 ([http://www.musicstudies.org/CompEthno\\_JIMS\\_071201.html](http://www.musicstudies.org/CompEthno_JIMS_071201.html)).
- Wessel, David, Rimas Avizienis, Adrian Freed, and Matthew Wright. 2007. A Force Sensitive Multi-touch Array Supporting Multiple 2-D Musical Control Structures. In *Proceedings of the International Conference on New Interfaces for Musical Expression*: 41-45. New York.
- Wright, Matthew. 2007. Survey of Models of Musical Rhythm (invited talk, abstract only, full paper in print). *2<sup>nd</sup> Symposium on Music, Rhythm and the Brain*, Stanford, CA: Center for Computer Research in Music and Acoustics (CCRMA).  
<http://sica.stanford.edu/cast/rhythm>
- Zbyszynski, Michael, Matthew Wright, Edmund Champion. 2007. Design and Implementation of CNMAT's Pedagogical Software. In *Proceedings of the International Computer Music Conference*, Vol. 2: 57-60. Copenhagen.
- Zbyszynski, Michael, Matthew Wright, Ali Momeni, and Daniel Cullen. 2007. Ten Years of Tablet Musical Interfaces. In *Proceedings of the International Conference on New Interfaces for Musical Expression*: 100-105. New York.
- Freed, Adrian, Rimas Avizienis, and Matthew Wright. 2006. Beyond 0-5V: Expanding Sensor Integration Architectures. In *Proceedings of the International Conference on New Interfaces for Musical Expression*: 97-100. Paris.
- Freed, Adrian, Ahm Lee, John Schott, Frances Marie Uitti, Matthew Wright, and Michael Zbyszynski. 2006. Comparing Musical Control Structures and Signal Processing Strategies for the Augmented Cello and Guitar. In *Proceedings of the International Computer Music Conference*: 636-642. New Orleans, LA: International Computer Music Association.
- Wright, Matthew. 2006. Shifty Looping: meter-aware, non-repeating rhythmic loops. In *Proceedings of the International Computer Music Conference*: 44. New Orleans, LA: International Computer Music Association.
- Wright, Matthew and Edgar Berdahl. 2006. Towards Machine Learning of Expressive Microtiming in Brazilian Drumming. In *Proceedings of the International Computer Music Conference*: 572-575. New Orleans, LA: International Computer Music Association.
- Wright, Matthew. 2005. Open Sound Control: an enabling technology for musical networking. *Organised Sound*, 10, no. 3: 193-200.
- Wright, Matthew and Julius O. Smith III. 2005. Open-Source Matlab Tools for Interpolation of SDIF Sinusoidal Synthesis Parameters. In *Proceedings of the International Computer Music Conference*: 632-635. Barcelona: International Computer Music Association.
- Schmeder, Andrew W. and Matthew Wright. 2004. A Query System for Open Sound Control. In *Proceedings of the OpenSoundControl Conference*. Berkeley, CA: CNMAT.
- Wright, Matthew. 2004. Brief overview of OSC and its application areas. In *Proceedings of the OpenSoundControl Conference*. Berkeley, CA: CNMAT.
- Wright, Matthew, Jonathan Berger, Christopher Burns, Chris Chafe, Fernando Lopez-Lezcano, and Julius O. Smith, III. 2004. CCRMA Studio Report. In *Proceedings of the International Computer Music Conference*: 268-271. Miami, FL: International Computer Music Association.
- Wright, Matthew, Ryan J. Cassidy, and Michael F. Zbyszynski. 2004. Audio and Gesture Latency Measurements on Linux and OSX. In *Proceedings of the International Computer Music Conference*: 423-429. Miami, FL: International Computer Music Association.
- Wright, Matthew, Roger Dannenberg, Stephen Pope, Xavier Rodet, Xavier Serra, and David Wessel. 2004. Panel: Standards from the Computer Music Community. In *Proceedings of*

- the International Computer Music Conference*: 711-714. Miami, FL: International Computer Music Association.
- Wright, Matthew, Adrian Freed, and Ali Momeni. 2003. Open Sound Control: State of the Art 2003. In *Proceedings of the International Conference on New Interfaces for Musical Expression*: 153-159. Montreal.
- Wessel, David and Matthew Wright. 2002. Problems and Prospects for Intimate Musical Control of Computers. *Computer Music Journal* 26, no. 3: 11-22.
- Wessel, David, Matthew Wright, and John Schott. 2002. Intimate Musical Control of Computers with a Variety of Controllers and Gesture Mapping Metaphors. In *Proceedings of the International Conference on New Interfaces for Musical Expression (NIME)*: 171-173. Dublin, Ireland.
- Wessel, David, Matthew Wright, and John Schott. 2002. Situated Trio: An Interactive Live Performance for a Hexaphonic Guitarist and Two Computer Musicians with Expressive Controllers. In *Proceedings of the International Conference on New Interfaces for Musical Expression (NIME)*. Dublin, Ireland.
- Wright, Matthew. 2002. *OpenSound Control Specification*. Web page. Available from <http://opensoundcontrol.org/specification>.
- Wright, Matthew. 2002. Problems and Prospects for intimate and satisfying sensor-based control of computer sound. In *Proceedings of the Symposium on Sensing and Input for Media-Centric Systems (SIMS)*: 1-6. Santa Barbara, CA.
- Madden, Timothy, Ronald Bruce Smith, Matthew Wright, and David Wessel. 2001. Preparation for Interactive Live Computer Performance in Collaboration with a Symphony Orchestra. In *Proceedings of the International Computer Music Conference*: 310-313. Havana, Cuba: International Computer Music Association.
- Wessel, David and Matthew Wright. 2001. Problems and Prospects for Intimate Musical Control of Computers. In *Proceedings of the CHI '01 Workshop on New Interfaces for Musical Expression (NIME'01)*. Seattle, WA: ACM SIGCHI.
- Wright, Matthew, Adrian Freed, Ahm Lee, Timothy Madden, and Ali Momeni. 2001. Managing Complexity with Explicit Mapping of Gestures to Sound Control with OSC. In *Proceedings of the International Computer Music Conference*: 314-317. Havana, Cuba: International Computer Music Association.
- Chaudhary, Amar, Adrian Freed, and Matthew Wright. 2000. An Open Architecture for Real-time Music Software. In *Proceedings of the International Computer Music Conference*: 492-495. Berlin, Germany: International Computer Music Association.
- Schwarz, Diemo and Matthew Wright. 2000. Extensions and Applications of the SDIF Sound Description Interchange Format. In *Proceedings of the International Computer Music Conference*: 481-484. Berlin, Germany: International Computer Music Association.
- Wright, Matthew, James Beauchamp, Kelly Fitz, Xavier Rodet, Axel Röbel, Xavier Serra, and Gregory Wakefield. 2000. Analysis/Synthesis Comparison. *Organised Sound* 5, no. 3: 173-189.
- Wright, Matthew, Amar Chaudhary, Adrian Freed, Sami Khoury, David Wessel, and Ali Momeni. 2000. An XML-based SDIF Stream Relationships Language. In *Proceedings of the International Computer Music Conference*: 186-189. Berlin, Germany: International Computer Music Association.
- Chaudhary, Amar, Adrian Freed, and Matthew Wright. 1999. An Open Architecture for Real-Time Audio Processing Software. Audio Engineering Society 107th Convention, preprint #5031: Audio Engineering Society.



- Harvey, Brian and Matthew Wright. 1999. *Simply Scheme: Introducing Computer Science*. Cambridge, MA: MIT Press.
- Wright, Matthew. 1999. *SDIF (Sound Description Interchange Format) Specification*. Web page. Available from <http://www.cnmat.berkeley.edu/SDIF/Spec.html>.
- Wright, Matthew, Amar Chaudhary, Adrian Freed, Sami Khoury, and David Wessel. 1999. Audio Applications of the Sound Description Interchange Format Standard. Audio Engineering Society 107th Convention, preprint #5032: Audio Engineering Society.
- Wright, Matthew, Sami Khoury, Raymond Wang, and David Zicarelli. 1999. Supporting the Sound Description Interchange Format in the Max/MSP Environment. In *Proceedings of the International Computer Music Conference*: 182-185. Beijing, China: International Computer Music Association.
- Wright, Matthew and Eric Scheirer. 1999. Cross-Coding SDIF into MPEG-4 Structured Audio. In *Proceedings of the International Computer Music Conference*: 589-596. Beijing, China: International Computer Music Association.
- Wessel, David, Cyril Drame, and Matthew Wright. 1998. Removing the Time Axis from Spectral Model Analysis-Based Additive Synthesis: Neural Networks versus Memory-Based Machine Learning. In *Proceedings of the International Computer Music Conference*: 62-65. Ann Arbor, Michigan: International Computer Music Association.
- Wessel, David, Matthew Wright, and Shafqat Ali Khan. 1998. Preparation for Improvised Performance in Collaboration with a Khyal Singer. In *Proceedings of the International Computer Music Conference*: 497-503. Ann Arbor, Michigan: International Computer Music Association.
- Wright, Matthew. 1998. Implementation and Performance Issues with OpenSound Control. In *Proceedings of the International Computer Music Conference*: 224-227. Ann Arbor, Michigan: International Computer Music Association.
- Wright, Matthew, Amar Chaudhary, Adrian Freed, David Wessel, Xavier Rodet, Dominique Virolle, Rolf Woehrmann, and Xavier Serra. 1998. New Applications of the Sound Description Interchange Format. In *Proceedings of the International Computer Music Conference*: 276-279. Ann Arbor, Michigan: International Computer Music Association.
- Wright, Matthew and David Wessel. 1998. An Improvisation Environment for Generating Rhythmic Structures Based on North Indian "Tal" Patterns. In *Proceedings of the International Computer Music Conference*: 125-128. Ann Arbor, Michigan: International Computer Music Association.
- Iyer, Vijay, Jeff Bilmes, David Wessel, and Matthew Wright. 1997. A Novel Representation for Rhythmic Structure. In *Proceedings of the International Computer Music Conference*: 97-100. Thessaloniki, Hellas: International Computer Music Association.
- Wright, Matthew and Adrian Freed. 1997. Open Sound Control: A New Protocol for Communicating with Sound Synthesizers. In *Proceedings of the International Computer Music Conference*: 101-104. Thessaloniki, Hellas: International Computer Music Association.
- Wright, Matthew, David Wessel, and Adrian Freed. 1997. New Musical Control Structures from Standard Gestural Controllers. In *Proceedings of the International Computer Music Conference*: 387-390. Thessaloniki, Hellas: International Computer Music Association.
- McMillen, Keith A., David Simon, and Matthew Wright. 1996. Communications network interface, and adapter and method therefor. *United States Patent #5,483,535, Zeta Music Partners*.

- Wright, Matthew. 1995. A Hierarchy of Perceptually Meaningful Controls in ZIPI's Music Parameter Description Language (MPDL). In *Proceedings of the Society for Music Perception and Cognition*, ed. David Wessel. Berkeley, CA: CNMAT.
- Freed, Adrian, Mark Goldstein, Mike Goodwin, Michael Lee, Keith McMillen, Xavier Rodet, David Wessel, and Matthew Wright. 1994. Real-Time Additive Synthesis Controlled by a Mixture of Neural-Networks and Direct Manipulation of Physical and Perceptual Attributes. In *Proceedings of the International Computer Music Conference*: 362-363. Aarhus, Denmark: International Computer Music Association.
- McMillen, Keith, David Simon, David Wessel, and Matthew Wright. 1994. A New Network and Communications Protocol for Electronic Musical Devices. In *Proceedings of the International Computer Music Conference*: 443-446. Aarhus, Denmark: International Computer Music Association.
- McMillen, Keith, David Simon, and Matthew Wright. 1994. A Summary of the ZIPI Network. *Computer Music Journal* 18, no. 4: 74-80.
- McMillen, Keith, David Wessel, and Matthew Wright. 1994. The ZIPI music parameter description language. *Computer Music Journal* 18, no. 4: 52-73.
- McMillen, Keith, Matthew Wright, David Simon, and David Wessel. 1994. ZIPI—An Inexpensive, Deterministic, Moderate-Speed Computer Network for Music and Other Media. In *Proceedings of the Audio Engineering Society 13th International Conference: Computer-Controlled Sound Systems*: 145-151. Dallas, TX: Audio Engineering Society.
- Wright, Matthew. 1994. A comparison of MIDI and ZIPI. *Computer Music Journal* 18, no. 4: 86-91.
- Wright, Matthew. 1994. Answers to frequently asked questions about ZIPI. *Computer Music Journal* 18, no. 4: 92-6.
- Wright, Matthew. 1994. Examples of ZIPI applications. *Computer Music Journal* 18, no. 4: 81-5.

**Graduate Degree Committees (all UCSB):**

- David Adams, in progress, MAT Ph.D.
- Owen Campbell, in progress, MAT MS.
- Xárene Eskandar, in progress, MAT Ph.D.
- Michael Hetrick, in progress, MAT Ph.D.
- Paul Jacobs, in progress, MAT MS.
- Rodger (Jieliang) Luo, MAT Ph.D.
- Joseph Tilbian, in progress, MAT Ph.D.
- Muhammad Hafiz Wan Rosli, in progress, MAT Ph.D.
- Cecilia Wu, in progress, MAT MS and Ph.D.
- Karl Yerkes, in progress, MAT Ph.D.
- Dallas Mercer, 2013, MAT MS, *Act/React: An Interactive Audio-Visual Installation for Real-Time Musical Performance*
- Karl Yerkes, 2014, MAT MS, *Accessible Development of Interactive Multimedia Artwork on Modular Computing Systems*
- Charles Roberts, 2014, MAT Ph.D., *Immediacy In Creative Coding Environments*
- David Adams, 2013, MAT MS, *Tracey: An Acoustic Ray Tracer for Sound Design*
- Joshua Dickinson, 2013, MAT MS, *Standing Waves: a multimodal, motion-capture composition in the AlloSphere*
- JoAnn Cho, 2012, Music Composition Ph.D., *Blurred Gaze for String Quartet: An Analysis*

Erin Putnam, 2012, Music (Ethnomusicology) MA, *World Music and the Individual: the Negotiation of Cultural Capital and Identity Through Bossa Nova in the United States*  
Graham Wakefield, 2012, MAT Ph.D., *Real-Time Meta-Programming for Interactive Computational Arts*  
Brian Hansen, 2011, MAT MS, *Modeling Sensory Dissonance in Space: Revelations in Sonic Sculpture*  
Michael Hetrick, 2011, MAT MS, *DrawJong 2.0*  
Greg Shear, 2011, MAT MS, *The Electromagnetically Sustained Rhodes Piano*  
Ryan McGee, 2010, MAT MS, *Sound Element Spatializer*  
Philip Popp, 2010, MAT MS, *Individualized Intuitive Control of Spectral Model Synthesis*  
Charles Roberts, 2009, Media Art Technology (MAT) MS, *Towards a Dynamic Framework for Interactivity*

### **Postdoctoral Advisees**

Charles Roberts, 2014-15, Ph.D. from UCSB.  
Graham Wakefield, 2012, Ph.D. from UCSB.  
Lance Putnam, 2011-12, Ph.D. from UCSB.  
Paul Mannerheim, 2010-11, Ph.D. from University of Southampton, UK.

### **Selected Compositions:**

*Catch and Throw (2006)*, Series of composed improvisations for hexaphonic guitar and tablet-controlled live electronics  
*Tune (2005)*, Oud and interactive electronics  
*Static Modulation (2005)* (collaboration with Stanford Improvisation Collective), tuba, jaw harp, computer live sampling and playback, and junk electronics  
*Undefined Studies I, II, and III (2003)* (collaborations with Roberto Morales and Ali Momeni), pre-Columbian instruments, percussion, real-time audio and image processing  
*Un Pajarito Me Lo Dijo (2003)* (collaboration with Roberto Morales), pre-Columbian flutes and interactive electronics  
*Knew No Order Now (2001)* (collaboration with John Schott), hexaphonic guitar and tablet-controlled interactive electronics (played at International Computer Music Conference)  
*Big Drums (2001)* (collaboration with Evan Fiske, Fred Fung, and Calvin Lai), percussion, ney, and interactive electronics  
*Garden of Earthly Delights (2000)* (collaboration with Abbie Conant), trombone and interactive electronics

### **Selected List of Computer Music Performances:**

2014: “Imagining the Universe from Music, Spirituality and Tradition”, a network concert with Khenpo Sodargye Rinpoche, and artists from UC Santa Barbara, Stanford University, Virginia Tech, and the University of Guanajuato (11/21/14).  
2014: World premiere of “Feedback II” during the “autumn WAVEFORMS” CREATE Concert (11/19/14), extending our exploration of ensemble feedback network instruments with a digital matrix mixer and audience projection visualizing the matrix state and each node’s input and output signals  
2014: World premiere of “Feedback” during the Media Arts Technology program End of Year Show (June 2014). Each performer’s unique instrument has an audio input that is somehow incorporated into the audio output, which is split so that it goes both to a loudspeaker and as the input to the next performer in a loop: A’s output is the input to B, B goes to C, etc. Thus we collectively continuously determine the overall loop gain (from

- total decay to self-oscillation explosion) and delay, with what becomes a single group instrument whose behavior depends vitally on each performer's actions.
- 2014: "Des Gestes Touchants": musical/theatrical performance featuring dancer Maud Watel-Kazak, vibrotactile music by Alexis Crawshaw, and the CREATE Ensemble.
- 2014: World premiere of the CREATE Ensemble's "Medium," featuring an ensemble live coding sound generation and mapping strategies based on live input from a motion-tracked (with Kinect) dancer. A custom multi-layered interactive instrument connects one performer's body to a collection of musicians and their instruments so he is both the conductor and the channel allowing sound through the system. (CREATE Concert 4/23/14)
- 2013: "Ambiguous Suggestions", a piece for conductor and ensemble where the conductor where a conductor improvises a macrostructure for the performance by drawing 2D lines via custom software that transmits and animates them at various speeds for each selected performer. Audience projection shows the conductor's and all performers' views. (11/20/13)
- 2013: "Study of transtemporal ensemble instrument"" CREATE Ensemble performance with each member's instrument an iPad running the custom waveform looping software "Twkyr" (described in a 2014 NIME paper), MAT End of Year Show (5/23/13).
- 2013: Trio improvisation with *Duo Pantomorf* (Per Anders Nilsson and Palle Dahlstedt, 1/16/23)
- 2012: "Passages": Novel technology-enabled performance with a local network of live coders "passing around a melody" via transmitted code fragments.
- 2010-present: Several performances per year as director of CREATE Ensemble, including interactive computer music performance, constrained improvisations, live coding, and outside pieces including John Zorn's *Cobra* and Mark Applebaum's *Metaphysics of Notation*.
- 2009: Directed CREATE Ensemble in *Captured Situations*, Composition for acoustic instruments, live sampling, and network-synchronized rhythmic reinjection
- 2006: Internet performance (California/Mexico) with Chris Chafe and Roberto Morales
- 2005: Solo computer and Afghan rûbab, "Surround the Sound" listening event, inaugural performance for CCRMA's Listening Room (11/28/05)
- 2005: Premiered *Tune* for solo oud and computer at the Festival of New American Music, CSU Sacramento (11/5/05)
- 2005: Gino Robair, Birgit Ulher, Matt Wright trio, concert of experimental improvised music at CNMAT (9/28/05)
- 2005: Performed *Sketch 1 for Afghan Rûbab and Computer* at the CCRMA summer concert (7/21/05)
- 2005: Played electronics in Larry Ochs' composition *The Mirror World (for Stan Brakhage)* as part of the Rova Saxophone Quartet's Rovaté festival (6/10-11/05)
- 2005: Solo performance of computer and oud at "Musicollage: A Happening by CCRMA and Friends," at the Cantor Arts Center, Stanford (3/8/05)
- 2004-2005: Stanford Improvisation Collective ("[sic]") concerts, directed by Mark Applebaum. Performances included a music department concert (3/7/04, Campbell Recital Hall, Stanford), "Music and Dance by Chance" (2/27/05, Roble Gymnasium, Stanford), "White Plaza Event #1 (a Site-Specific Event)" (3/12/05, White Plaza, Stanford)
- 2003: "Another Abstraction": Joel Davel, Roberto Morales, Matt Wright trio. Concerts at CNMAT (10/17-18/03) and CCRMA (11/7/03)
- 2002-2003: Summer concerts at the Nuevos Enfoques y Expresiones en Composición y Tecnología, Media and Music Fest, Multimedia Center, CENART, Mexico City. Concert

- performance with Don Buchla, Edmund Campion, Mari Kimura, Ali Momeni, David Wessel
- 2002: “That Situated Trio”: John Schott, David Wessel, Matt Wright. Performances of improvised electroacoustic music in Berkeley (“An afternoon of radical electronic improvisation” at the Jazz School, and two concerts at CNMAT), Dublin (during the NIME conference), and Amsterdam (at STEIM and Kraakgeluiden)
- 2002: John Schott, Ben Goldberg, Scott Amendola, Matt Wright quartet: “Inventions and Trio Sinfonias”
- 2002: John Schott, David Bithell, Larry Ochs, Ches Smith, Matt Wright quintet. “New Music with New Technology,” noon concert at U.C. Berkeley (10/2/02), and evening concert (3/25/02)
- 2001: Played computer as part of Ben Goldberg’s “Brainchild” (6/24/01)
- 2000: Performed live electronics part for *Garden of Earthly Delights* with Abbie Conant (trombone), at CNMAT (1/27/00)
- 1996-2002: *Confluence*, Indo-Pakistani raga singing by Shafqat Ali Khan accompanied by interactive electronics by David Wessel and Matt Wright, and later also Ali Momeni. A notable feature of these performances was my use of pre-analyzed sinusoidal models of phrases in each raga sung by Shafqat, resynthesized during improvised performance via the control of a Wacom tablet, thereby effecting a “Shafqat versus Shafqat” live duet with human and synthesized versions of the same voice.

### **Selected List of Traditional Music Performances**

- Ali Akbar College of Music* recitals, Hindustani (North Indian raga) classical music, San Rafael, CA, vocal (3/2/02) and sarode (2/28/03).
- Arabic Takht recording: 10-minute suite of Arabic compositions and improvisations recorded by a 6-piece group as an example for the CD to accompany the 3<sup>rd</sup> edition of the popular Ethnomusicology textbook “World Music: A Global Journey” by Miller and Shahriari. I played oud, the Arabic fretless short-necked lute.
- Azidan*, Andalusian classical music of North Africa (Nuba/Tushiyya music), Algerian mondol, quarter-tone banjo, oud, riqq, bendir, and vocals. Multiple concerts 2001-07.
- Bateria Lucha*, *Maracatu Nação Cazadero*, *Grupo Samba Rio*, and *Bateria Quilombo* (Oakland, CA, USA), *Samba Masala Band* (Victoria, BC, Canada), *Corpos Percussivos* (Recife, PE, Brazil), *Maracatu Badia* (Olinda, PE, Brazil), and *Santa Barbara Samba School* (Santa Barbara, CA, USA) various Afro-Brazilian percussion instruments. 2002-10, including San Francisco (2004-07) and Recife/Olinda (2007) Carnival parades and Santa Barbara (2009-14) Solstice Parades.
- Greek Rebetika Music with *The Smyrna Time Machine*, oud and bouzouki, 2004-06.
- Moh Alileche Ensemble*, Algerian (Kabyle) folkloric music, oud and quarter-tone banjo. Performances included Ashkenaz and the U.C. Berkeley International House in Berkeley, the CCRMA stage, and KPFA radio. 2005-6 and 2013.
- UCSB Middle East Ensemble*, oud, setar, Algerian Mondol, Afghani Rûbab, Herati Dutar, gongue, and vocals, many concerts 2008-15, including a series of concerts in Egypt (Cairo Opera House and Houses of Culture in Ismailia, Helwan, and Beni Suef) as guests of the Egyptian Ministry of Culture in Summer 2010.
- Zendegi*, Afghan classical and dance/folkloric music, Afghan Rûbab, Herati Dutar, and vocals. Multiple concerts 2003-7 including the Stanford International Center’s 2006 *International Month* and Berkeley’s 2004 *Himalayan Fair*.

### **Multimedia Systems Design and Implementation:**

AlloSphere (UCSB): implementing and continuously upgrading projectors, tracking system, audio, heterogeneous networks of UNIX and Macintosh computers, interactive devices. Extensive systems-level documentation on the design, use, and troubleshooting of this unique combination of technologies.

CNMAT: helped design sound spatialization theatre. Involved in studio redesigns and Center-wide technical strategy, equipment selection, placement, and installation.

Lotte Lehmann Concert Hall (UCSB) permanent surround sound installation: mounting loudspeakers to brick walls, above-ceiling power and multichannel audio cabling, minimizing setup time for full-surround concerts and instruction.

Ongoing CREATE studios upgrades (Mac computers and software, digital audio, loudspeakers, studio gear). Preparing an annual budget request to fund new equipment, repairs, and salary for a student Technical Coordinator to work under my supervision.

Managing lending libraries of mixing boards, loudspeakers, microphones, digital audio interfaces, synths, controllers, cables, and other equipment at CNMAT and CREATE.

All of these projects resulted in widely-used, cutting-edge research systems designed around emerging technologies, along with documentation and extensive training of faculty, staff, students and other users.

### **Concert Production:**

I have been involved in the production of dozens of concerts and other performances of acoustic, electronic, Western, non-Western, jazz, rock, orchestral, choral, chamber, folkloric, and experimental music, in venues including churches, concert halls, noisy bars, outdoor festivals, recital halls, radio stations, computer music centers, dance halls, university campuses, and street parades. I have skills and experience in every aspect of concert production, including performance, composition, promotion, installation and breakdown (e.g., of surround sound systems), acoustical treatment, security, artist relations, stage management, equipment lending/borrowing/return, mixing, recording, and archiving. Part of this work has been to revive the software for canonical interactive computer pieces (e.g., Pierre Boulez's *Dialogue de l'homme double*, George Benjamin's *Antara*, Jean-Claude Risset's *Duet for One Piano*, and Kaija Saariaho's *NoaNoa*) so as to be able to run them again on current hardware and operating systems.

### **Collaborations with Composers:**

Over the years I have worked closely with composers, including Per Bloland, Edmund Campion, Joann Cho, John Chowning, Steve Coleman, Richard Felciano, Christopher Jette, Marisol Jimenez, Greg Kuhn, John MacCallum, Miya Masaoka, Ali Momeni, Roberto Morales, John Schott, Ron Smith, Yaron Sokolov, David Wessel, Olly Wilson, and Justin Yang, helping them on the technical level to achieve their musical goals, often in the form of a real-time software implementation in the Max/MSP environment. As a musician and composer myself, I find I am able to communicate effectively with composers to understand and help them refine their ideas about what they would like from the computer; as an expert programmer, I am able to implement technical solutions beyond the abilities of most composers.

Many other composers have relied in their own computer music work upon software components that I implemented and shared, especially various CNMAT Max/MSP externals.

**Professional Service:**

I have done numerous peer reviews for the MIT Press, the *Computer Music Journal*, the International Computer Music Conference (ICMC), the International Conference on Music Information Retrieval (ISMIR), and the New Interfaces for Musical Expression (NIME) conference. I moderated the panel sessions *Analysis/Synthesis Comparison* at ICMC 2000 and *Standards from the Computer Music Community* at ICMC 2004. In 2014-15 I served as an external thesis examiner for a Ph.D. examination at the Sydney Conservatorium of Music.

In addition, I have served the computer music community since 1996 by helping to design, specify, implement (in the form of high quality open-source software), promote, and guide the development of the widely used and widely appreciated SDIF (Sound Description Interchange Format) and OSC (Open Sound Control) standards. A large collection of the software I created at CNMAT is available for open-source download at <http://cnmat.berkeley.edu/downloads> especially the pedagogically oriented “Max/MSP/Jitter Depot.” And my most recent open-source project AlloSystem (the C++ software infrastructure used for interactive audiovisual worlds in the AlloSphere) is now available on GitHub (<https://github.com/AlloSphere-Research-Group/AlloSystem>).