Ge Wang Curriculum Vitae

Assistant Professor
Center for Computer Research in Music and Acoustics (CCRMA)
Department of Music (also Computer Science, by Courtesy)
Stanford University
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2016.11.28

RESEARCH INTERESTS

Art of design; Computer music; Programming languages and interactive software design for computer music; Human-computer interaction design; Audiovisual design; Mobile music, Computer-mediated performance & ensembles: laptop orchestra and mobile phone orchestra; Sound synthesis and analysis; Expressive musical game design; Aesthetics of music technology design; Education at intersection of arts, engineering, and design.

EDUCATION

Degree	Institution	Date	Field
PhD	Princeton University Department of Computer Science *The ChucK Audio Programming Language: A Strongly-timed and On-the-fly Environ/mentality (thesis)* Advisor: Perry R. Cook	2008	Computer Science
M.S.	Princeton University Department of Computer Science Advisor: Perry R. Cook	2003	Computer Science
B.S.	Duke University Department of Computer Science	2000	Computer Science
High School	Shawnee Mission South High School, Overland Park, KS	1996	-

WORKS: DESIGN, SOFTWARE, AND PUBLICATIONS

Book

Wang, G. 2017. *The Art of Computer Music Design.* (working title) Stanford University Press. [*under contract and in preparation*]

• Recipient of a 2016 Guggenheim Fellowship. http://www.gf.org/fellows/ge-wang/

Design: ChucK Music Programming Language

Chief designer and architect. 2003–present | A programming language for real-time sound synthesis and music creation. At the core of ChucK is a unique way of thinking about time and deterministic concurrency as powerful, precise mechanism for crafting sound and physical interactions (we call this strongly-timed). Designed for digital artists and musicians. http://chuck.stanford.edu/

Wang, G. 2008. *The ChucK Audio Programming Language: A Strongly-timed and On-the-fly Environ/mentality.* PhD Thesis, Princeton University.

Wang, G., P. R. Cook, and S. Salazar. 2015. "ChucK: A Strongly-timed Computer Music Language." *Computer Music Journal*. 39(4):10-29.

Kapur, A., P. R. Cook, S. Salazar, G. Wang. 2015. *Programming for Musician and Digital Artists: Making Music with ChucK*. Manning Press. (ISBN: 1617291706)

Design: Ocarina and Ocarina 2

Inventor and chief designer. Smule 2008 and 2012 | One of the original Apple Hall of Fame apps, Ocarina transformed the iPhone into a flute-like instrument, while offering a social dimension that allows its users to hear one another anonymously around the world. With more than 10 million downloads, Ocarina combines physical interaction design and social experimentation that remains a milestone mobile music application, serving as a window into what might be possible. http://www.gewang.com/ocarina/

Wang, G. 2014. "Ocarina: Designing the iPhone's Magic Flute." *Computer Music Journal.* 38(2):8-21.

Stanford Laptop Orchestra (SLOrk)

Founding director; designer of instruments, works, and curricula; curator of over 30 performances. 2008–present | The Stanford Laptop Orchestra (SLOrk) is a large-scale, computer-mediated ensemble and instrument design laboratory that explores cutting-edge technology in combination with conventional musical contexts – aiming to radically transform both. Founded in 2008 by director Ge Wang and students, faculty, and staff at Stanford, this unique ensemble comprises more than 20 laptops, human performers, controllers, and custom multi-channel speaker arrays designed to provide each computer meta-instrument with its own identity and presence. Overall 100 new instruments and works premiered. http://slork.stanford.edu/

Wang, G., D. Trueman, S. Smallwood, and P. R. Cook. 2008. "The Laptop Orchestra as Classroom." *Computer Music Journal.* 32(1):26-37.

Smallwood, S., D. Trueman, P. R. Cook, and G. Wang. 2008. "Composing for Laptop Orchestra." *Computer Music Journal.* 32(1):9-25.

TED Talk

Wang, G. 2014. "DIY Orchestra of the Future" **TED**. Over 1 million viewers.
http://www.ted.com/talks/ge_wang_the_diy_orchestra_of_the_future

Stanford Mobile Phone Orchestra (MoPhO)

Founding director. 2008–2012
http://mopho.stanford.edu/

Expressive Mobile Music Startup: Smule

Co-founder, 2008; Chief Creative 2008–2013; Chief Technology Officer, 2008–2012. Responsible for interaction-, product-, social-design; core interaction engine technology; research and development, marketing, PR, and outreach. Reached over 125 million users before stepping down in 2013.

Design: Additional Mobile Music Apps (with Smule)

Magic Piano (2010) • *Magic Fiddle* (2011) • *Magic Guitar* (2012) • *Zephyr* (2008) • *Sonic Lighter* (2008) • *Glee Karaoke* (2010, concept) • Ocarina (2008) • Ocarina 2 (2012)

Wang, G. 2016. "Game Design for Expressive Mobile Music." *New Interfaces for Musical Expression*. Brisbane, Australia.

Wang, G. 2014. "Principles of Visual Design for Computer Music." *International Computer Music Conference*, Athens.

Social Music Design: Leaf Trombone: World Stage

Creator and chief designer. Smule 2009 | An experimental social design where users can create musical content, perform using a mobile phone-based instrument, and present that performance to the greater community. As part of a social game, these users are then recruited to serve as juries in online, real-time judging sessions, giving feedback and ratings to the performers. This creates an ecosystem where a participant can take on the role of performer, judge, observer, and/or composer. This experiment was fully implemented and deployed in an iPhone application, Smule's Leaf Trombone: World Stage, which has reached more than 800,000 users.

Wang, G., S. Salazar, J. Oh, and R. Hamilton. 2015. "World Stage: Crowdsourcing Paradigm for Expressive Social Mobile Music." *Journal of New Music Research*. 44(2):112-128.

Software: Sndpeek (Lightweight Audio Visualization)

Designer. 2005—present.
http://www.gewang.com/software/sndpeek/

Capturing and Rendering of Musical Performance on Mobile Devices (U.S. Patent)

Inventor. As a social exchange for user musical performances, the globe visualization pervaded Smule mobile music apps – from *Ocarina* to *Magic Piano* to *Glee Karaoke*, *I Am T-Pain*, and *Sing!* – Allowing users to listen to peer and to participate musically. (see U.S. Patent 8222507)

Writings: Books, Journal Articles, and Book Chapters

Wang, G. 2017. *The Art of Computer Music Design*. Stanford University Press. (under contract; Guggenheim Fellowship project 2016-2017).

Wang, G. 2017. "On-the-fly Programming: Using Code as an Expressive Musical Instrument." *The NIME Reader*. (in preparation; peer-selected influential article, revised from 2004 initial publication; New Interfaces for Musical Expression).

Fiebrink, R, G. Wang, P. R. Cook. 2017. "Don't Forget the Laptop: Using Native Input Capabilities for Expressive Musical Control." *The NIME Reader*. (in preparation; peer-selected influential article, revised from 2007 initial publication; New Interfaces for Musical Expression).

Wang, G. 2016. "Some Principles of Visual Design for Computer Music." *Leonardo Music Journal*. 26:14-19.

Wang, G., P. R. Cook, and S. Salazar. 2015. "ChucK: A Strongly-timed Computer Music Language." *Computer Music Journal*. 39(4):10-29.

Wang, G., S. Salazar, J. Oh, and R. Hamilton. 2015. "World Stage: Crowdsourcing Paradigm for Expressive Social Mobile Music." *Journal of New Music Research*. 44(2):112-128.

Kapur, A., P. R. Cook, S. Salazar, G. Wang. 2015. *Programming for Musician and Digital Artists: Making Music with ChucK*. Manning Press. (ISBN: 1617291706)

Wang, G. 2014. "Ocarina: Designing the iPhone's Magic Flute." *Computer Music Journal*. 38(2):8-21.

Wang, G. 2017. "Improvisation of the Masses: Anytime, Anywhere Music." *Oxford Handbook of Improvisation Studies*. G. Lewis and B. Piekut Eds. Oxford University Press. (forthcoming)

Wang, G. 2017. "The Laptop Orchestra." *The Routledge Companion to Music, Technology, and Education*. A. King, E. Minonides, and A. Ruthmann, Eds. Routledge Publishing. (forthcoming)

Wang, G., G. Essl, and H. Pentinnen. 2014. "The Mobile Phone Orchestra." *Oxford Handbook of Mobile Music Studies, Volume 2*. S. Gopinath and J. Stanyek Eds. Oxford University Press, pp. 453-469.

Wang, G. 2014. "The World Is Your Stage: Making Music on the iPhone." *Oxford Handbook of Mobile Music Studies, Volume 2*. S. Gopinath and J. Stanyek Eds. Oxford University Press, pp. 487-504.

Hamilton, R., J. Smith, and G. Wang. 2011. "Social Composition: Musical Data Systems for Expressive Mobile Music." *Leonardo Music Journal*. Vol. 21:57-64.

Oh, J. and G. Wang. 2011. "Converge: An Omni-Biographical Composition." *Computer Music Journal Emile*. Vol. 9.

Wang, G. "A History of Programming and Music." 2008. *Cambridge Companion to Electronic Music*. N. Collins and J. D'Escrivan Eds. Cambridge University Press.

Smallwood, S., D. Trueman, P. R. Cook, and G. Wang. 2008. "Composing for Laptop Orchestra." *Computer Music Journal.* 32(1):9-25.

Wang, G., D. Trueman, S. Smallwood, and P. R. Cook. 2008. "The Laptop Orchestra as Classroom." *Computer Music Journal.* 32(1):26-37.

Misra, A., G. Wang, and P. Cook. 2007. "Musical Tapestry: Re-composing Natural Sounds." *Journal of New Music Research.* 36(4):241-250. (*winner: 2006 ICMA Swets & Zietlinger Distinguished Paper Award*)

Kapur, A., G. Wang, P. Davidson, P. Cook. 2005. "Interactive Network Media: A Dream Worth Dreaming?" *Organised Sound.* 10(3):209-219.

Conference Publications

Wang, G. 2016. "Game Design for Expressive Mobile Music." *New Interfaces for Musical Expression*. Brisbane, Australia.

Meacham, A., S. Kannan, and G. Wang. 2016. "The Laptop Accordion." *New Interfaces for Musical Expression*. Brisbane, Australia.

Michon, R., J. O. Smith, C. Chafe, M. Wright, and G. Wang, 2016. "Nuance: Adding Multi-Touch Force Detection to the iPad," *In Proceedings of the Sound and Music Computing Conference* (SMC-16). Hamburg, Germany.

Wang, G. and R. Michon, 2016. "FaucK!! Hybridizing the Faust and ChucK Audio Programming Languages," *In Proceedings of the Sound and Music Computing Conference* (SMC-16). Hamburg, Germany.

Wang, G. 2016. "Thoughts on Virtual Reality Design for Musical Expression." *ACM CHI Music and HCI Workshop*. San Jose.

Wang, G. 2014. "Principles of Visual Design for Computer Music." *International Computer Music Conference*, Athens.

Salazar, S. and G. Wang. 2014. "miniAudicle for iPad: Touchscreen-based Music Software Programming." *International Computer Music Conference*, Athens.

Bryan, N. J., G. J. Mysore, and G. Wang. 2014. "ISSE: An Interactive Source Separation Editor." *ACM Human Factors in Computing Systems (CHI)*, Toronto.

Salazar, S. and G. Wang. 2014. "Auraglyph: Handwritten Computer Music Composition and Design." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. London.

Bryan, N., G. Mysore, G. Wang. 2013. "Source Separation of Polyphonic Music with Interactive User-Feedback on a Piano-Roll Display." *In International Society for Music Information Retrieval Conference*. Brazil.

Oh, J. and G. Wang. 2013. "Laughter Modulation: from Speech to Speech-Laugh" (Show & Tell) *In Proceedings of Interspeech, ISCA. Lyon*, France.

Oh., J. and G. Wang. 2013. "LOLOL: Laugh Out Loud On Laptop." *In Proceedings of the International Conference on New Interfaces for Musical Expression.* Seoul.

Cerqueira, M., S. Salazar, and G. Wang. 2013. "SoundCraft: Transducing Starcraft 2." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Seoul.

Oh., J. and G. Wang. 2012. "Evaluating Crowd-sourcing through Amazon Mechanical Turk as a Technique for Conducting Music Perception Experiments." *In Proceedings of the International Conference of Music Perception and Cognition.* Thessaloniki.

Byran, N., J. Herrera, and G. Wang. 2012. "User-guided Variable-rate Time-stretching via Stiffness Control*." In Proceedings of the International Conference on Digital Audio Effects.* York, UK.

Salazar, S. and G. Wang. 2012. "Chugens, Chubgraphcs, and Chugins: 3 Tiers for Extending ChucK." *In Proceedings of the International Computer Music Conference*. Slovenia.

Wang, G. 2012. "10 Past and Future Lessons of Laptop Orchestra." (Keynote) *1st International Symposium on Laptop Ensembles and Orchestras (SLEO).* Baton Rouge.

Bortz, B., S. Salazar, J. Jaivovich, R. B. Knapp, and G. Wang. 2012. "ShEMP: A Mobile Framework for Shared Emotion, Music, and Physiology." *3rd International Workshop on Social Behaviour in Music (SBM2012), in framework of the 14th International Conference on Multimodal Interaction*. Santa Monica.

Rotondo, M., N. Kruge, and G. Wang. 2012. "Many-Person Instruments for Computer Music Performance." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Ann Arbor, Michigan.

Carlson, C. and G. Wang. 2012. "Borderlands: An Audiovisual Interface for Granular Synthesis." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Ann Arbor, Michigan.

Wang, G. 2011. "Breaking Barriers with Sound." (Keynote) *ACM Symposium on User Interface Software and Technology (UIST)*. Santa Barbara.

Wang, G., J. Oh, S. Salazar, and R. Hamilton. 2011. "World Stage: A Crowdsourcing Paradigm for Social Mobile Music." *In Proceedings of the International Computer Music Conference*. Huddersfield, UK.

Oh, J. and G. Wang. 2011. "Audience-participation Techniques Based on Social Mobile Computing." *In Proceedings of the International Computer Music Conference*. Huddersfield, UK.

Wang, G., J. Oh, and T. Lieber. 2011. "Designing for the iPad: Magic Fiddle." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Oslo.

Bryan, N. J. and G. Wang. 2011. "Two Turntables and a Mobile Phone." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Oslo.

Kruge, N. and G. Wang. 2011. "MadPad: A Crowdsourcing System for Audiovisual Sampling." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Oslo.

Byran, N. J. and G. Wang. 2011. "Musical Influence Network Analysis and Rank in Sample-Based Music." *In Proceedings of the International Conference on Music Information Retrieval*. Miami.

Oh, J., J. Herrera, N. J. Bryan, L. Dahl, and G. Wang. 2010. "Evolving the Mobile Phone Orchestra." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney.

Byran, N. J., J. Herrera, J. Oh, and G. Wang. 2010. "MoMu: A Mobile Music Toolkit." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney.

Dahl, L. and G. Wang. 2010. "Sound Bounce: Physical Metaphors in Designing Mobile Music Performance." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney.

Choi, H. and G. Wang. 2010. "LUSH: An Organic Eco-Musical System." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Sydney.

Chang, M. H., G. Wang, T. Moore, and J. Berger. 2010. "Sonification and Visualization of Neural Data." *In Proceedings of the International Conference on Auditory Display*. Washington D.C.

Wang, G. 2009. "Designing Smule's iPhone Ocarina." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Pittsburgh.

Wang, G., N. J. Bryan, J. Oh, and R. Hamilton. 2009. "Stanford Laptop Orchestra (SLOrk)." *In Proceedings of the International Computer Music Conference.* Montreal.

Wang, G., G. Essl, J. Smith, S. Salazar, P. Cook, R. Hamilton, R. Fiebrink, J. Berger, D. Zhu, M. Ljungstrom, A. Berry, J. Wu, T. Kirk, E. Berger, J. Segal. 2009. "Smule = Sonic Media: An Intersection of the Mobile, Musical, and Social." *In Proceedings of the International Computer Music Conference.* Montreal.

Fiebrink, R., P. Cook, S. Smallwood, D. Trueman, and G. Wang. 2009. "Laptop Orchestras and Machine Learning in Real-time Music Performance." *ACM CHI 2009, Computational Creativity Support Workshop*. Boston.

Wang, G., G. Essl, and H. Pentinnen. 2008. "MoPhO: Do Mobile Phones Dreams of Electric Orchestras?" *In Proceedings of the International Computer Music Conference*. Belfast.

Essl, G., G. Wang, and M. Rohs. 2008. "Developments and Challenges Turning Mobile Phones into Generic Music Performance Platforms." *In Proceedings of Mobile Music Workshop*. Vienna.

Caceres, J., R. Hamilton, D. Iyer, C. Chafe, and G. Wang. 2008. "China on the Edge: Explorations in Network-based Performance." *In Proceedings of the International Conference on Digital Arts (ARTECH)*. Porto, Portugal.

Fiebrink, R., G. Wang, and P. R. Cook. 2008. "Foundations for On-the-fly Learning in the ChucK Programming Language." *In Proceedings of the International Computer Music Conference*. Belfast.
(winner: 2008 ICMA Best Presentation Award)

Fiebrink, R., G. Wang, and P. R. Cook. 2008. "Support for MIR Prototyping and Real-time Applications of the ChucK Programming Language." *In Proceedings of the International Conference on Music Information Retrieval*. Philadelphia.

Wang, G., R., Fiebrink, and P. R. Cook. 2007. "Combining Analysis and Synthesis in the ChucK Programming Language." *In Proceedings of the International Computer Music Conference.* Copenhagen.

Fiebrink, R., G. Wang, and P. R. Cook. 2007. "Don't Forget the Laptop: Using Native Input Capabilities for Expressive Musical Control." *In Proceedings of the International Conference on New Interfaces for Musical Expression.* New York.

Wang, G., A. Misra, and P. R. Cook. 2006. "Building Collaborative interFaces in the Audicle." *In Proceedings of the International Conference on New Interfaces for Musical Expression.* Paris.

Misra, A., P. R. Cook, and G. Wang. 2006. "TAPESTREA: Sound Scene Modeling by Example" *(Sketch) ACM SIGGRAPH.* Boston.

Misra, A., P. R. Cook, and G. Wang. 2006. "A New Paradigm for Sound Design." *In Proceedings of the International Conference on Digital Audio Effects.* Montreal.

Salazar, S., G. Wang, and P. R. Cook. 2006. "miniAudicle and ChucK Shell: New Interfaces for ChucK Development and Performance." *In Proceedings of the International Computer Music Conference.* New Orleans.

Trueman, D., P. R. Cook, S. Smallwood, and G. Wang. 2006. "PLOrk: Princeton Laptop Orchestra, Year 1." *In Proceedings of the International Computer Music Conference.* New Orleans.

Wang, G., P. R. Cook, and A. Misra. 2005. "Designing and Implementing the ChucK Programming Language." *In Proceedings of the International Computer Music Conference.* Barcelona.

Wang, G., A. Misra, A. Kapur, and P. R. Cook. 2005. "Yeah ChucK It! => Dynamic Controllable Interface Mapping." *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Vancouver.

Misra, A., Wang, G., and P. R. Cook. 2005. "SndTools: Real-time Audio DSP and 3D Visualization." *In Proceedings of the International Computer Music Conference*. Barcelona.

Wang, G., A. Misra, P. Davidson, and P. R. Cook. 2005. "Co-Audicle: A Collaborative Audio Programming Space." *In Proceedings of the International Computer Music Conference*. Barcelona.

Kapur, A., G. Tzanetakis, N. Virji-Babul, G. Wang, and P. R. Cook. "A Framework for Sonification of Vicon Motion Capture Data" *In Proceedings of the International Conference on Digital Audio Effects*. Madrid.

Wang, G., P. R. Cook. 2004. "On-the-fly Programming: Using Code as an Expressive Musical Instrument". *In Proceedings of the International Conference on New Interfaces for Musical Expression*. Hamamatsu, Japan.

Wang, G., P. R. Cook. 2004. "ChucK: A Programming Language for On-the-fly, Real-time Audio Synthesis and Multimedia." *In Proceedings of ACM Multimedia*. New York City.*(co-winner: 2004 ACM Multimedia Open Source Software Competition)*

Wang, G., P. R. Cook. 2004. "Audicle: A Context-sensitive, On-the-fly Audio Programming Environ/mentality." *In Proceedings of the International Computer Music Conference*. Miami. *(winner: 2004 ICMA Best Presentation Award)*

Wang, G., P. R. Cook. 2003. "ChucK: A Concurrent, On-the-fly Audio Programming Language". *In Proceedings of the International Computer Music Conference*, Singapore. *(winner: 2003 ICMA Best Presentation Award)*

AWARDS AND ACCOMPLISHMENTS

***John Simon Guggenheim Foundation Fellowship**, 2016-2017*
For prior achievement and exceptional promise in scholarship or creativity in the arts. Project: *The Art of Computer Music Design* (working title): a book and manifesto about the artful design of technology, meticulously designed using a radical, unconventional format. http://www.gf.org/fellows/ge-wang/

***Residency, Stanford Center @ Peking University**, 2014*
To bring Stanford Laptop Orchestra to China for residency, joint graduate seminar with local University students, and live performance; first laptop orchestra venture into China.

***Champion of the Arts**, 2013*
Annual award recognizes an individual for significant contribution to promotion of music and the arts in Silicon Valley. Presented by Cantabile Youth Singers and City of Palo Alto.

***Faculty Fellow, Stanford Center @ Peking University**, 2013*
Summer residency to promote the arts and technology in outreach to China.

***Co-founder of Smule**, a mobile music startup, 2008-2013*
Built from inception in 2008 to 125 millions users in 2013.

***Inventor and chief designer of mobile music apps** (iPhone, iPad, Android):*
Ocarina, Magic Piano, Leaf Trombone: World Stage, Magic Fiddle
Combined: over 100 million users (since 2008)

Apple Hall of Fame App: Ocarina
Inducted in the inaugural class in 2010 by Apple Inc.

***Stanford University "Three Books" Author**, 2012*
As author of mobile/social music applications for class 2016; curated by Mark Applebaum

San Francisco Symphony Board of Governors
Board Member, 2011-present

***Emerging Pioneer Award**, 2012*
Selected by independent jurors, KAPi at CES 2012

Annenberg Faculty Fellow *2009-2011, Stanford University*
"… to recognize outstanding junior faculty in the Humanities and Arts."

Best Children's App*: Magic Piano, 2011*
Selected by 11 independent jurors from over 500 products at KAPi, CES 2011

The 2010 Creativity 50 Award
Awarded annually to 50 individuals worldwide for creative thinking and doing in media, technology, and culture, Creativity Magazine, 2010.

Entrepreneurs We Love 2010*, Inc. Magazine*
… for "turning app development into an art form."

National Science Foundation Creative IT Grant *(No. IIS-0855758), 2010-2012*
Co-PI (with Georgia Tech), exploring improvisation in computer music

App-Nation Pioneer Award *2010*
Awarded for achievement impacting development and growth of mobile applications.

The 2009 Creativity 50 Award
Awarded annually to 50 individuals worldwide for creative thinking and doing in media, technology, and culture, Creativity Magazine, 2009.

The Silicon Valley 40 Under 40
Awarded annually to 40 individuals for innovation, San Jose Business Journal, 2009.

2006 ICMA/Swets & Zeitlinger Distinguished Paper Award
"TAPESTREA: Re-composing Natural Sounds" (with Ananya Misra and Perry Cook)
Awarded annually to one paper at the International Computer Music Conference.

2004 ICMA Best Presentation Award
For: "The Audicle: A Context-sensitive, On-the-fly Audio Programming Environ/mentality"
Chosen from 210 research paper presentations, by vote from conferees ICMC 2004

Co-winner: 2004 ACM Multimedia Best Open-Source Software Competition
For: "ChucK : Programming Language for Real-time Audio and Multimedia"
Selected from 10 open-source projects, by jury at ACM Multimedia 2004, New York.

2003 ICMA Best Presentation Award
For: "ChucK: A Concurrent, On-the-fly Audio Programming Language"
Chosen from 80 research paper presentations, by vote from conferees at ICMC 2003

Presented more than 100 invited talks and keynotes *(2007–present)*
Topics: computer music, programming, music software design, mobile music, social music, laptop orchestra, design, art & entrepreneurship.

PATENTS (AWARDED AND PENDING)

"System and Method for Capturing and Rendering of Performance on Synthetic Musical Instrument." U.S. Patent **8222507**. With Spencer D. Salazar and Perry R. Cook, assigned to Smule 2012. Description: Capturing multiple gestures on a mobile device (blowing on the microphone, touching various points on a multi-touch screen, tilting the device, etc.), encoding those gestures (effectively compressing the performance), using the gesture codes to control a synthesizer in real time, uploading the gesture codes to a server for later transmittal and resynthesis on another client, using uploaded gestures to render a sound file (.wav, .mp3, etc.) on a server and offering playback of such files on a mobile or non-mobile device (e.g., via a web browser). Geo-coding the location of a performance, transmitting that information to a server, and using it later to display resynthesized performances on a globe or map (either on mobile device or other).

"World Stage for Pitch-Corrected Vocal Performance." Patent Filed 2012, **U.S. Non-provisional 12/876133.** With Spencer D. Salazar, Rebecca A. Fiebrink, Mattias Ljungstrom, Jeffrey C. Smith, and Jeannie Yang. Description: Global Community Singing: retrieval and playing back (with globe display) on a mobile device and mixed (possibly pitch-corrected and/or harmonized), rendered, and geo-coded vocal performance. Collecting and displaying further geo-coded data about performances, such as "likes/loves," rankings, thumbs-up/down, chat and comments, etc. Mixing multiple asynchronous performances into crowdsourced choirs.

"System and Method for Capture and Rendering of Performance on Synthetic String Instrument." Patent Filed 2011, **U.S. Non-provisional 13/292773.** With Spencer D. Salazar, Rebecca A. Fiebrink, Mattias Ljungstrom, Jeffrey C. Smith, and Jeannie Yang. Description: Capture of finger gestures on virtual strings, combined with finger gestures indicative of bowing one or more strings, using an encoding of the gesture streams to control a digital string instrument model for sound synthesis. Displaying score-driven markers on the multi-touch display to indicate to the user where and when gestures should be performed in real-time.

"Audiovisual Sampling for Percussive-Type Instrument with Crowd-sourced Content Sourcing and Distribution." Patent Filed 2012, **U.S. Non-provisional 13/607153.** With Nick Kruge and Perry Cook. Description: Capture of short video / audio clips, triggered by audio events and settings. Converting and pre-caching of clip video frames. Trigger playback of clips by tapping, in a displayed array (palette) of clips, with optional pitch and time transformations. Video playback (dynamic framerate) driven by audio playback. Capturing of taps and gestures, for playback in looping mode.

SELECTED KEYNOTES AND FEATURE PRESENTATIONS

– ***TED talk: The DIY Orchestra of the Future*** –
http://www.ted.com/talks/ge_wang_the_diy_orchestra_of_the_future

- A journey of computer music research that weaves together ChucK, laptop orchestra, mobile music, and global music making. July 2014. (**Featured TED talk**; over 1 million views)

– ***The Art of Designing Computer Music*** –

- International Conference on Mathematics and Computation in Music. June 2015. London. (**Keynote**)
- CCTV (China Central Television) "We World", China's first TED-like TV program series, 2015. (**Broadcast primetime nationwide**; 80 million viewers).

– ***ChucK: 10 Years of Programming for Music*** –

- California Institute of the Arts, Digital Arts Expo & Conference on Computer Science in Music Education. April 2014. (**Keynote**)

– ***Breaking Barriers with Sound (A Computer Music Odyssey)*** –

- ACM UIST – Symposium on User Interface and Software and Technology. Santa Barbara, October 2011. (**Keynote**)
- Duke (2013), CU Boulder (2013), Yale (2012), Dartmouth (2012) (**Distinguished Lecture Series**)
- The Entertainment Gathering (EG) #4, #5, #6 (2010, 2011, 2012)
- Web 2.0 Expo. San Francisco, May 2010. (**Keynote**)
- Billboard Magazine Mobile Entertainment Summit. San Francisco, October 2010. (**Keynote**)

– ***Music, Computer, People (Art, Technology, Entrepreneurship)*** –

- Mobile Developer Conference China. Beijing, October 2012. (**Keynote**)
- Stanford University Entrepreneur's Corner. 2012.
- Duke University. Arts and Entrepreneurship Initiative (**Inaugural Speaker**)

– ***10 Past and Future Lessons of Laptop Orchestra*** –

1st Symposium on Laptop Ensembles & Orchestras (SLEO): International Workshop on Music Performance for Laptops and Mobile Devices. LSU, April 2012. (**Keynote**)

– ***The World is Your Stage: Mobile-Social Music*** –

- Stanford University, Computer Forum Annual Meeting, Mobile & Social Workshop. April 2013. (**Keynote**)
- Contemplum, Temple University. March 2013. (**Keynote**)
- University of Southern California, Annenberg School for Communication and Journalism, Chinese Internet Research Conference, May 2012. (**Keynote**)
- St. Lawrence String Quartet Chamber Music Seminar. Stanford University, June 2011. (**Keynote**)
- CES 2011 Kids at Play Interactive Summit. Las Vegas, January 2011. (**Keynote**)
- European E-commerce Conference (EEC). Madrid, October 2010. (**Keynote**)

INVITED TALKS & KEYNOTES (FULL LIST)

Titles & Topics: Artful Design. *The Art of Designing Computer Music; Music, Computer, People; The DIY Orchestra of the Future; Breaking Barriers with Sound; 10 Past and Future Lessons of Laptop Orchestra; ChucK Programming Language; The World is Your Stage: Mobile-Social Music; Mobile Phone Orchestras; The Leading Edge: Software Design for Musical Expression; Mobile Music, Social Music; On-the-fly Programming; Real-time Languages and Environments for Synthesis, Composition, and Performance; Teaching Programming with Music and Laptop Orchestra; New Classrooms in Computer Science + Music; Designing Interfaces for Music; Creating New Expressive Social Mediums on Mobile Phones; At the Intersection of Music and Computer Science; Art and Entrepreneurship.*

May 2017. International Conference on New Interfaces for Musical Expression (NIME), Copenhagen. **(Keynote)**

November 2016. Stanford Chinese Students and Scholars Symposium **(Keynote)**

November 2016. Stanford University HCI Meeting: "Music, Computing, Design"

October 2016. Stanford University HCI "People, Computing, Design Seminar": *An Ocarina Retrospective*.

September 2016. Stanford New Student Orientation: "Engaging with Faculty"

August 2016. World Lab Summer Institute Exhibition @ Stanford Center in Peking University, also @ Stanford d.school.

March 2016. Stanford University Parents' Weekend: Back to School Class for Parents: "The Art of Design and Computer Music."

March 2016. Waffles.js community meetup.

March 2016. Oculus Rift Headquarters: "Artful Design of Computer Music"

February 2016. RedBull's "Hack the Hits Music Tech Hackathon" **(Keynote)**

January 2016. Stanford-Silicon Valley Innovation Study (from Tsinghua).

October 2015. China Entrepreneur Club: "Art and Innovation of Silicon Valley"

Summer 2015. We World. *Ge Wang: Computer Music Researcher*. China's first TED-like nationwide TV program, produced by China Central Television (CCTV). **(Broadcast in primetime,** viewed by more 80 million people**)**

June 2015. International Conference on Mathematics and Computation in Music, London 2015. *The Art of Designing Computer Music.* **(Keynote)**

April 2015. MIT Museum. *The Art of Designing Computer Music*. (with Eran Egozy).

March 2015. Escondido Elementary School Family Science Night. *The Science of Sound and Computer Music.*

February 2015. Mathematical Sciences Research Institute and Berkeley City College. *Making Music Socially: A Story of People and Technology in the 21st Century* (with Madeline Huberth).

July 2014. TED. *The DIY Orchestra of the Future*. (**featured TED talk**)
http://www.ted.com/talks/ge_wang_the_diy_orchestra_of_the_future

May 2014. Digital Arts Expo & Conference on Computer Science in Music Education, featuring *Processing* and *ChucK*. CalArts. (**Keynote**)

May 2014. TEDxStanford. *THIS Is Computer Music.*

March 2014. KCPB Product Works Design Panel, hosted by John Maeda.

March 2014. Stanford University Parents' Weekend

February 2014. Mathematical Sciences Research Institute / Berkeley City College (**Distinguished Lecture Series**)

November 2013. Adobe (**Distinguished Lecture Series**)

November 2013. UIC Innovation Center, Mobile Processing (**Keynote**)

October 2013. United States Library of Congress (**Special Presentation on Music and Technology**)

October 2013. IHS Interactive Technology Summit (**Keynote**)

October 2013. Los Altos High School, Science and Technology Week.

September 2013. Stanford d.school, ReDesigning Theater: Live and Digital Performance.

September 2013. Stanford University, Residential Program combining the Arts (ITALIC) and Science (SIMILE).

September 2013. Duke University, Arts and Entrepreneurship (**Inaugural Speaker**)

September 2013. Duke University, Pratt School of Engineering (**Distinguished Lecture Series**)

September 2013. Duke University, Technology, Society, and Culture (guest lecture)

July 2013. Stanford Center at Peking University.

May 2013. Fujitsu Technology Symposium. Computer History Museum.

April 2013. Stanford University, Computer Forum Annual Meeting, Mobile & Social Workshop. (**Keynote**)

March 2013. Contemplum, Temple University. *(***Keynote***)*

March 2013. University of Colorado, Boulder. (**ATLAS Speaker Series**)

November 2012. TECH+: Technology, Economy, Culture, Humanity. Seoul.

October 2012. Mobile Developer Conference China. Beijing. (**Keynote**)

October 2012. Mobile Developer Conference China. Beijing. (**Master Class on mobile music design**)

October 2012. Stanford University Entrepreneur's Corner. (with Jeff Smith)

October 2012. Dartmouth College, Neukom Institute for Computational Science (**Donoho Colloquium Series**)

September 2012. Stanford University's *Three Books*. As author of social mobile music apps *Ocarina*, *MadPad*, and *I Am T-Pain*. Curated by Mark Applebaum.

May 2012. University of Southern California, Annenberg School for Communication and Journalism, Chinese Internet Research Conference (**Keynote**)

April 2012. 1st Symposium on Laptop Ensembles & Orchestras (SLEO): International Workshop on Music Performance for Laptops and Mobile Devices. (**Keynote**)

April 2012. The Entertainment Gathering (EG 6) Monterey, CA.

April 2012. Yale University, Computer Science Department. (**Distinguished Lecture Series**)

March 2012. Game Developer's Conference (GDC), San Francisco, CA.

November 2011. TECH+: Technology, Economy, Culture, Humanity. Seoul, Korea.

October 2011. ACM UIST: Symposium on User Interface and Software and Technology. (**Keynote**)

September 2011. Duke University: Technical and Social Foundations of the Internet (presentation via Skype, hosted by Owen Astrachan)

June 2011. St. Lawrence String Quartet Chamber Music Seminar. (**Keynote**)

April 2011. USC Music Computation and Cognition Laboratory.

April 2011. The Entertainment Gathering (EG5) Monterey, CA. (with Jieun Oh)

March 2011. South by Southwest 2011.

January 2011. CES 2011; Kids at Play Interactive Summit. (**Keynote**)

December 2010. SF Music Technology Summit. Panel on mobile music creation.

October 2010. European E-commerce Conference (EEC) 2010. Madrid. (**Keynote**)

October 2010. Billboard Magazine Mobile Entertainment Summit. (**Keynote**)

September 2010. Duke University: Technical and Social Foundations of the Internet (presentation via Skype, hosted by Owen Astrachan)

July 2010. Stanford University Science Outreach Program; presentation on Music, Science, and Technology to high school students.

June 2010. Foo Camp (presentation and performance, with Jieun Oh)

May 2010. Maker Faire (**Featured Presentation**)

May 2010. SF Music Technology Summit. Panel presentation with Max Mathews, John Chowning, Roger Linn, and David Wessel.

May 2010. San Francisco Music Hack Day.

May 2010. Mathematical Sciences Research Institute, with Jieun Oh.

May 2010. Web 2.0 Expo. San Francisco. (**Keynote**)

April 2010. Stanford Computer Science Annual Forums.

April 2010. Apple. "Bring Your Kids to Work Day"

April 2010. Emerging Communications Conference. (**Keynote**)

April 2010. Art Center Nabi, Seoul (remote via Skype)

March 2010. Open MAKE @ Exploratorium: Making Music.

February 2010. MacWorld 2010, San Francisco.

January 2010. Carnegie Mellon University, Silicon Valley.

January 2010. The Entertainment Gathering (EG4), Monterey, CA.

November 2009. CCRMA Colloquium.

November 2009. Los Altos High School, Science + Technology Week.

October 2009. Duke University (remote via Skype, hosted by Owen Astrachan).

October 2009. Stony Brook University, New York.

August 2009. Foo Camp '09.

June 2009. Stanford University Science Outreach Program; Presentation on Music Technology for high school science educators.

June 2009. Apple Worldwide Developer Conference, San Francisco. (Featured Presentation)

June 2009. Frost and Sullivan Conference, San Francisco (**Keynote**)

May 2009. Mobile Music Symposium, University of Minnesota.

April 2009. Louisiana State University.

April 2009. Harvard University Systems Seminar.

March 2009. Apple iPhone OS 3.0 Announcement Event.

March 2009. iGames Summit 2009, San Francisco.

March 2009. Emerging Communications Conference. (**Keynote**)

March 2009. California College of the Arts.

November 2008. Stanford University Symbolic Systems Forum.

November 2008. International Symposium on Culture Technology, Seoul.
April 2008. Alberta College of Art and Design. Calgary, Canada.
(with Rebecca Fiebrink)
March 2008. California Institute of the Arts.
March 2008. *Rencontres Musicales Pluridisciplinaires*; theme: "Digital Arts and Programming" Lyon, France.
January 2008. Duke University Visualization Seminar; ISIS Seminar.
January 2008. Ex'pression College for Digital Arts, Insider's Day.
December 2007. Bay Area Music Technology Group, San Francisco.
December 2007. Living the Knowledge Society workshop, Santa Clara University.
November 2007. Stanford University HCI Seminar - People, Computer, and Design.
September 2007. Bay Area Music Technology Group, San Francisco.
June 2007. Electro-music 2007 Festival, Philadelphia. (with Rebecca Fiebrink)
April 2006. School of the Art Institute of Chicago (1-week residency/workshop).
October 2005. University of Beijing, China.
October 2005. Central Conservatory of China / MusicAcoustica 2005.
September 2005. University of Rome (La Sapienza), Rome, Italy.
May 2005. University of Victoria, Department of Computer Science. BC, Canada.
February 2005. Transmediale 2005 Festival. Berlin, Germany.

TEACHING EXPERIENCE

Fall 2007 – present, Stanford University
Assistant Professor
CCRMA | Music Department (also Computer Science, by courtesy)
- *Music, Computing, and Design* (2008-present)
- *Virtual and Augmented Reality Design for Music* (2015-present)
- *Mobile Music* (2010-2015)
- *Composing, Coding, and Performance for Laptop Orchestra* (2008-present)
- *Compositional Algorithms and Psychoacoustics* (2008-present)
- *Fundamentals of Computer-Generated Sound* (2008, with Chris Chafe 2007)
- *Soundwire Ensemble* (with Chris Chafe 2007)

Stanford Center at Peking University
- *Designing Solutions for Global Grand Challenges* (with James Landay, 2016)
- Stanford Laptop Orchestra in China (Summer 2014)

MOOC (Kadenze, Coursera): Programming for Musicians and Digital Artists With the ChucK Programming Language (Fall 2013-present)

Fall 2006, Princeton University
Instructor + Co-Director (with Perry Cook): *Princeton Laptop Orchestra.*
Graduate + Undergraduate Seminar: *Composing for Laptop Orchestra*
Designed core curriculum (lectures, projects, performances).

Delivered weekly lectures, rehearsals, and discussions on issues ranging from software design, composition, musical performance design, interface design and mapping, networking, instruction building, sound synthesis.
Co-directed major performances (*NYC Debut*, *PLOrktastic Chambers Music*, *Final Concert*), premiering 15+ all-new pieces for the laptop orchestra.

Fall 2006, Dartmouth College *(commuted weekly between Dartmouth and Princeton)*
Instructor, Graduate Seminar: *In the Service of Electro-Acoustic Music: Digital Signal Processing + Software Design/Implementation Techniques*
Designed curriculum teaching DSP theory and applications together with software design and implementation techniques, topics, and "best practices".
Delivered weekly lectures and discussions on issues ranging from signal processing (theory and applications, Fourier analysis, filter analysis, classic synthesis techniques, physical modeling, speech modeling, etc.) and computer science (interactive system design, object-oriented principals, design patterns, real-time audio, data structures for sound synthesis, optimization, C++/Java)

Fall + Spring 2005, Princeton University
Teaching assistant: *PLOrk: Princeton Laptop Orchestra*
(Perry Cook, Dan Trueman, Scott Smallwood, Ge Wang)
designed half of core curriculum based on ChucK programming language
delivered weekly class lectures on ChucK/Audicle and programming
helped to build PLOrk networking infrastructure in Max/ChucK

2004, Stanford CCRMA Summer Workshop (Banff Centre, Canada).
Teaching Assistant: *Digital Signal Processing for Audio: Spectral and Physical Models*. (for Perry Cook and Xavier Serra)

2003, Princeton University. Teaching assistant: *Advanced Programming Techniques*.
(for Brian Kernighan, with Limin Jia)
mentored of 7 groups over 2 months in designing 3-tiered system

2002, Princeton University. Teaching assistant: *Human Computer Interaction*.
(for Perry Cook)

2000, Duke University. Teaching assistant: *Introduction to Computer Graphics*.
(for Pankaj Agarwal)
designed and held precepts and OpenGL samples
designed and implemented public scene file format and parser for student use

1999 – 2000, Duke University. Teaching assistant: *Advanced Object-oriented Programming* (for Owen Astrachan and Robert Duvall)

1997 – 1999, Duke University. Teaching assistant: *Data Structures II*
(for Owen Astrachan and Robert Duvall)

Ph.D. GRADUATE STUDENTS

• Nicholas J. Bryan, Stanford CCRMA Ph.D. (graduated 2014)
Thesis: *Interactive Sound Source Separation*
• Jieun Oh, Stanford CCRMA Ph.D. (graduate 2014)
Thesis: *Affective Analysis and Synthesis of Laughter*
• Jorge Herrera, Stanford CCRMA Ph.D. (6th year)
• Spencer Salazar, Stanford CCRMA Ph.D. (6th year)
• Zhengshan Shi, Stanford CCRMA Ph.D. (2nd year)
• Jack Atherton, Stanford CCRMA Ph.D. (1st year)

WORKSHOPS

"Making Music with Your iPad"
December 2010, presented to middle-school music students
Ge Wang and Turner Kirk.
"Mobile Music Design and Programming"
New Interfaces for Music Expression (NIME 2010), Sydney Australia.
Nick Bryan, Jorge Herrera, Jieun Oh, Ge Wang
"Hacking ChucK + Designing Mobile Music"
San Francisco Music Hack Day, May 15, 2010
"Playing Music on Your iPhone and iPad"
May 7, 2010, Mathematical Sciences Research Institute, Berkeley, CA.
Ge Wang and Jieun Oh
"Rapid Prototyping for Real-time Music Information Retrieval with ChucK"
2008 International Conference on Music Information Retrieval (ISMIR)
Ge Wang, Rebecca Fiebrink, and Perry Cook
"ChucK Programming + Laptop Orchestras"
2008 Alberta College of Arts of Design, Calgary, Canada (invited)
Ge Wang and Rebecca Fiebrink
"Sound Design and Composing with TAPESTREA: Weaving Musical Tapestries"
2007 International Computer Music Conference
Ananya Misra, Ge Wang, and Perry Cook
"ChucK + On-the-fly Programming"
June 3, 2007. Electro-Music Festival
Ge Wang and Rebecca Fiebrink
"ChucK Programming Language"
November 5, 2006. International Computer Music Conference
Ge Wang, Perry Cook, Ananya Misra, Spencer Salazar, Rebecca Fiebrink
"ChucK + On-the-fly Programming"
April 2006. School of the Art Institute of Chicago, part of one week residency.
"Yeah ChucK It!"
May 24, 2005. International Conference on New Interface for Musical Expression
Ge Wang, Ananya Misra, Perry Cook, Ajay Kapur, and Adam Tindale
"ChucK + Audicle Programming Language"

February 6, 2005. Transmediale 2005 Media Festival
"ChucK: New Audio Programming Language"
November 17, 2005. Share 2004, NYC
Ge Wang and Phil Davidson

SELECTED MUSICAL WORKS AND PERFORMANCES

"Turenas: VR Visualization" (2016, with John Chowning, Matt Wright, and Wisam Reid). Full spherical visualization of John Chowning's *Turenas*, for the AlloSphere at University of California, Santa Barbara. Premiered in February, 2016.

"Beijing" (2014, with Madeline Huberth) for laptop orchestra. Stanford Laptop Orchestra Live in Beijing Concert at the Stanford Center @ Peking University in July 2014. Sounds recorded on location in Beijing; live processing via gestures.

"Contiuum" (2014, with Madeline Huberth) for laptop orchestra and live visuals.

Forward motion is.

A study in dynamics and balance;
cyclic tendrils ebbing and flowing, swelling and retreating;
timbres varying over pseudo-life-cycles;
voices echoing in space and through windows into processes set in motion
long before we are, and will continue long after;
like ocean waves, unrelenting, not looking back.

Forward motion is.

"Twilight" (2013) for laptop orchestra. Inspired by the classic science-fiction short story "Twilight" by John W. Campbell (published in 1934, under the pseudonym "Don A. Stuart"), this piece ruminates not of the dawn, ascension, nor triumph of the human race, but of one possible demise set seven million years in the future. This end is not one of annihilation through war, nor decimation from famine or disease, but a golden decrescendo of defeat brought on by the gradual, peaceful, but unstoppable usurping of technology and machines -- and the loss of man's curiosity and sense of wonder. From the original text:

"Twilight – the sun has set. The desert out beyond, in its mystic, changing colors. The great, metal city rising straight-walled to the human city above, broken by spires and towers and great trees with scented blossoms. The silvery-rose glow in the paradise of gardens above."

i. The Dead City

"And all the great city-structure throbbing and humming to the steady gentle beat of perfect, deathless machines built more than three million years before – and never touched since that time by human hands. And they go on. The dead city. The men that have lived, and hoped, and built – and died to leave behind them those little men who can only wonder and look and long for a forgotten kind of companionship.

They wander through the vast cities their ancestors built, knowing less of them than the machines themselves."

ii. A Song of Longings

"And the songs. Those tell the story best, I think. Little, hopeless, wondering men amid vast unknowing, blind machines that started three million years before – and just never knew how to stop. They are dead – and can't die and be still."

This is the first installment in the Twilight series for various and mixed media. The cycle explores the psychology, longing, beauty and sadness of a twilight of humanity ending not in a bang, but an irreversible powerdown, basked in the golden, lingering, dying glow of man's dusk.

"GG Music" (2013, with Mark Cerqueira and Spencer Salazar) for live 8-channel and Starcraft 2. This piece examines the possibilities of using a popular real-time strategy computer game as the interface to a rich musical environment. Two players go head-to-head in a competitive match of StarCraft 2, observed by a third performer. As they develop economies and wage battles against each other, SoundCraft (a custom software created with the Starcraft 2 Editor, Ruby, and the ChucK audio programming language) collects gameplay data, which is extensively sonified in real-time. The sonification rises and falls with the development of the ongoing match, exploring the relationship between StarCraft's gameplay mechanics and musical performance. New Interfaces for Musical Expression 2013.

"**Converge**" (2010, with Jieun Oh) for the Stanford Laptop Orchestra (SLOrk) and Stanford Mobile Phone Orchestra (MoPhO). Images, sounds, and sentiments from Jieun's and Ge's everyday lives are captured, time- and geo-tagged, and collected via iPhones and cloud-based servers; they converge during the performance in an audio-visual journey of memory, time, and space.

"**TBA**" (2007) for the Princeton Laptop Orchestra (PLOrk) and Stanford Laptop Orchestra (SLOrk). Orchestral Live Coding for 15 laptops using ChucK! Premiered in Princeton.

"**Joy of Chant**" (2007) for the Princeton Laptop Orchestra (PLOrk). (with Rebecca Fiebrink and Perry Cook). A scored and improvisatory work for laptop ensemble, using joystick- and keyboard-controlled real-time singing synthesis.

"**PLOrk Beat Science**" (2007, with Rebecca Fiebrink). An Adventure for Flute and HyPLOrkussion! Performances include: National Academy of Science Museum Washington DC, Electro-music 2007 Festival in Philadelphia, Princeton 2007, New Interfaces for Music Expression 2009, Pittsburgh.
`http://plork.cs.princeton.edu/beatscience/`

"**Crystalis**" (2006) for the Princeton Laptop Orchestra (PLOrk) and Stanford Laptop Orchestra (SLOrk). This is a sonic rumination of crystal caves in the clouds, where the only sounds are those of the wind and the resonances of the crystals. It uses two simple instruments called the *crystalis* and *wind-o-lin*. These instruments make use of the laptop keyboard (which controls pitch and resonance) and the trackpad (which the players "bow" in various patterns to generate sound).
`http://plork.cs.princeton.edu/listen/NYC/`

"**Loom (*Etude II pour un enfant seul*)**" (2006) for 8-channel tape using musical tapestry + sound scene re-composition, with Ananya Misra and Perry Cook. – ***juried*** – International Computer Music Conference.
`http://taps.cs.princeton.edu/`

"**ChucK ChucK Rocket**" (2006) (with Scott Smallwood, special thanks to Ananya Misra) for the Princeton Laptop Orchestra (PLOrk). Human players perform via a networked game-board for virtual mouse-like critters, creating patterns at various scales via patterns and sound objects.

"**CliX**" (2006) for the Princeton Laptop Orchestra (PLOrk) and Stanford Laptop Orchestra (SLOrk). Human operators type to make sounds, while their machines synthesize, synchronize, and spatialize the audio. Every key on the computer keyboard (upper/lower-case letters, numbers, symbols) is mapped to a distinct pitch (using the key's ASCII representation) and when pressed, emits a clicking sound that is synchronized in time to a common pulse. A (human) conductor coordinates frequency range, texture, movement, and timing.
`http://plork.cs.princeton.edu/listen/green/`

"**Non-Specific Gamelan Taiko Fusion**" (2005) for the Princeton Laptop Orchestra (PLOrk) and Stanford Laptop Orchestra (SLOrk). (with Perry Cook) This piece is an experiment in human controlled, but machine synchronized percussion ensemble performance, for 15 laptops, each with 6 channel hemispherical speakers.
`http://plork.cs.princeton.edu/listen/debut/`

"**Gigapop Ritual**" (2003) Montreal/Princeton Internet2/CA2Net concert, for Sitar and EDholak (Ajay Kapur, Montreal), DigitalDoo (Perry Cook. Montreal), Electronic Spoon / Networking (Ge Wang, Montreal), Graphics (Philip Davidson, Montreal), Tabla and EDholak (Manjul Bhargava, Princeton), Electric Violin and RBow (Dan Trueman, Princeton), and Bass (Tae Hong Park, Princeton). 2003 International Conference on New Interfaces for Musical Expression, Montreal.
`http://gigapop.cs.princeton.edu/`

"**On-the-fly Counterpoint**" (2003, with Perry Cook) duo live coding for laptops and projectors | `http://on-the-fly.cs.princeton.edu/`
(with Perry Cook) 2003 Listening in the Sound Kitchen Festival, Princeton, NJ.
(with Perry Cook) 2004 International Conference of New Interfaces for Musical Expression, Hamamatsu, Japan. – ***juried*** –
(10-person TOPLAP jam) 2005 Transmediale Festival, Club Maria, Berlin, Germany
(with Nick Collins) 2005 Off-ICMC, Barcelona, Spain.
(solo) 2005 MusicAcoustic Festival, Central Conservatory of China, Beijing, China
(with Perry Cook) 2006 SIGGRAPH Art Gallery – Electronically Mediated Performance. – ***juried*** –

CONCERTS DIRECTED AND CURATED

SLOrk in the Bing! May 2016. Ge Wang, Director; Matt Wright and Tim O'Brien Co-directors. "The Stanford Laptop Orchestra (SLOrk) presents it's a full-scale performance at Stanford University's Bing Concert Hall. All are cordially invited to

an evening of all news works for humans, laptops, hemispherical speaker arrays, and new instruments." Bing Concert Hall, Stanford University.

SLOrktastic Chamber Music 2016. April 2016. Ge Wang, Director; Matt Wright and Tim O'Brien, Co-directors. "The Stanford Laptop Orchestra presents an evening of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." CCRMA Stanford University.

SLOrk in the Bing! May 2015. Ge Wang and Madeline Huberth, Directors; "The Stanford Laptop Orchestra (SLOrk) presents it's a full-scale performance at Stanford University's Bing Concert Hall. All are cordially invited to an evening of works for the full ensemble of humans, laptops, hemispherical speaker arrays, and new instruments." Bing Concert Hall, Stanford University.

SLOrktastic Chamber Music 2015. April 2015. Ge Wang and Madeline Huberth, Directors. "The Stanford Laptop Orchestra presents an evening of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." CCRMA Stanford University.

SideLObe @ Cantor. February 2015. Ge Wang, Director. "SideLObe — the premier performance ensemble of the Stanford Laptop Orchestra — in collaboration with the Cantor Arts Center, presents a special performance event featuring electronic chamber music curated for Cantor's Modern and Contemporary Gallery." Stanford University Cantor Arts Center, Modern and Contemporary Gallery.

Stanford Laptop Orchestra: Live in Beijing. July 2014. Ge Wang, Director. The Stanford Laptop Orchestra (SLOrk) travels to China as part of a unique journey and joint graduate seminar with students from Stanford and Peking University. This marks the first time a laptop orchestra has traveled to and performed in the Far East. Stanford Center @ Peking University.

SLOrk in the Bing! May 2014. Ge Wang, Director; Spencer Salazar Co-director. "The Stanford Laptop Orchestra (SLOrk) presents it's a full-scale performance at Stanford University's Bing Concert Hall. All are cordially invited to an evening of works for the full ensemble of humans, laptops, hemispherical speaker arrays, and new instruments." Bing Concert Hall, Stanford University.

SLOrktastic Chamber Music 2014. May 2014. Director. "The Stanford Laptop Orchestra presents an evening of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." CCRMA Stanford University.

SLOrk in the Bing! June 2013. Jieun Oh and Ge Wang, Directors. "The Stanford Laptop Orchestra (SLOrk) presents its first full-scale performance at Stanford University's new Bing Concert Hall. All are cordially invited to an evening of works for the full ensemble of humans, laptops, hemispherical speaker arrays, and new instruments." Bing Concert Hall, Stanford University.

SLOrk 2012 Spring Concert. June 2012. Director. "The Stanford Laptop Orchestra (SLOrk) and Stanford Mobile Phone Orchestra (MoPhO) celebrates the conclusion of a wonderful 2012 season with a full-scale laptop orchestra concert featuring all new works by students and instructors in the SLOrk seminar." Stanford University.

SLOrktastic Chamber Music 2012. April 2012. Director. "The Stanford Laptop Orchestra presents an evening of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." Stanford University.

SLOrk 2011 Spring Concert. June 2011. Director. "The Stanford Laptop Orchestra (SLOrk) and Stanford Mobile Phone Orchestra (MoPhO) celebrates the conclusion of a wonderful 2011 season with a full-scale laptop orchestra concert featuring all new works by students and instructors in the SLOrk seminar." Stanford University.

SLOrktastic Chamber Music 2011. April 2011. Director. "The Stanford Laptop Orchestra presents an evening of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." Stanford University.

SLOrk 2010 Spring Concert. June 2010. Director. "The Stanford Laptop Orchestra (SLOrk) and Stanford Mobile Phone Orchestra (MoPhO) celebrates the conclusion of a wonderful 2010 season with a full-scale laptop orchestra concert featuring works by guest composers Chris Chafe, Bruno Ruviaro, and Marisol Jimenez as well as students and instructors in the SLOrk seminar." Stanford University.

SLOrktastic Chamber Music 2010, featuring Jordan Rudess. April 2010. Director. "The Stanford Laptop Orchestra presents an evening of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." Stanford University.

Stanford Mobile Phone Orchestra: "i, MoPhO: Music for iPhones". December 2009. Director. "The Stanford Mobile Phone Orchestra presents a concert of new music for iPhone." Stanford University, CCRMA Stage. *Covered by December 5th 2009 New York Times front page article.*

SLOrk 2009 Spring Concert. June 2009. Director. "The Stanford Laptop Orchestra (SLOrk) celebrates the conclusion of a wonderful 2009 season with a full-scale laptop orchestra concert." Stanford University.

SLOrktastic Chamber Music I + II. May 2009. Director. "The Stanford Laptop Orchestra (SLOrk) presents two evenings of all new works for laptop chamber music, by members of the SLOrk ensemble and seminar." Stanford University.

Stanford Laptop Orchestra @ Distinctive Voices, Beckman Center. March 2009. Director. Presented by the Beckman Center and the National Academy of Science, the Stanford Laptop Orchestra presents a concert and discussion. Irvine, CA.

Stanford Laptop Orchestra @ MacWorld. January 2009. Director. "The Stanford Laptop Orchestra presents a selection of works for a wide audience at MacWorld 2009." San Francisco, CA.

MoPhO @ ICMC. August 2008. Co-director – with Georg Essl and Henri Pentinnen. "The Stanford Mobile Phone Orchestra (MoPhO) presents works for mobile smart phones at the International Computer Music Conference." Belfast, Ireland.

SLOrktastic Chamber Music. May 2008. Director. "The Stanford Laptop Orchestra presents and evening of all new works for electronic chamber music, by members of the SLOrk ensemble and seminar. The public is cordially invited to join us in

exploring intimate sonic and musical spaces with performances crafted for up to six laptop stations." Stanford University.

Pacific Rim of Wire: An Online Concert with Chinain the Premiere of the Stanford Laptop Orchestra. April 2008. Co-curator and director – with Chris Chafe and Jindong Cai. "In this first-of-its-kind concert, musicians from Stanford University's renowned Center for Computer Research in Music and Acoustics (CCRMA) connects with musicians 6000 miles away in Beijing to perform – in real-time via the internet – a program that celebrates music, technology, and international collaboration, and marks the stage premiere of the Stanford Laptop Orchestra."

Sonic SLOrk Sculptures. April 2008. Director. "Stanford Laptop Orchestra presents an afternoon of music and sonic installation performances, among the statues and under the canopy of the New Guinea Sculpture Garden at Stanford University, in a first-ever outdoor laptop orchestra concert."

Mobile Phone Orchestra Debut. January 2008. Director. "CCRMA's Mobile Phone Orchestra presents an experimental concert featuring music performed on mobile electronic devices. Far beyond ring-tones, these interactive musical works take advantage of the unique technological capabilities of today's hardware, turning computer keypads, touch-screens and built-in accelerometers into powerful and mobile musical control systems."

Princeton Laptop Orchestra: Winter Concert. January 2007. Co-directed, with Perry Cook**.** "The Princeton Laptop Orchestra presents an evening of new music, composed and performed by members of the Fall 2006 PLOrk seminar and ensemble." Princeton University.

PLOrk in New York: Ear to the Earth Festival. New York City, October 2006. Co-directed, with Perry Cook. "For the Ear to the Earth Festival, the Princeton Laptop Orchestra has prepared a special set of sounds and musical works that explore our environments – both real and imagined, human and natural. These pieces do not aim to convey a single idea or message, but simply to evoke and to immerse the listener in familiar as well as alternate sonic surroundings."

Princeton Laptop Orchestra Debut. Princeton University, Fall 2005. Co-directed and instructed, with Dan Trueman, Perry Cook, and Scott Smallwood. "The debut concert of the Princeton Laptop Orchestra features works by instructors and students in inaugural PLOrk ensemble."

ADDITIONAL PERFORMANCES

"Under Construction: Bing Concert Hall." June 2012, Stanford University Bing Concert Hall. This "hard hat" required performances marked the first musical performance in Bing's main hall (while it was still under construction).

Beijing Modern Music Festival. May 2011, Central Conservatory of China. Performance of "Converge" and "Laugh" with Jieun Oh.

EG 2011. April 2011, curated by Michael Hawley. Performance of "Converge" with Jieun Oh.

Music and Brain Symposium. March 2011, curated by Jonathan Berger. Performance of "Converge" with Jieun Oh.

Music, Memory, and Aging Symposium. September 2010, curated by Jonathan Berger. Performed "Converge" with Jieun Oh.

NIME 2010 Mobile Music Concert. June 2010. Stanford Mobile Phone Orchestra performs as part of concert mediated via mobile phones (with Georg Essl and Greg Schiemer).

Stanford University Bing Concert Hall Groundbreaking. March 2010. Stanford Mobile Phone Orchestra, director and performer.

Stanford University Prospective Student Weekend. March 2009, 2010, 2011. Part of the final concert at Memorial Church, curated by Steve Sano. Stanford Mobile Phone Orchestra, Stanford Laptop Orchestra, director and performer.

Oakland Museum of California Grand Reopening. March 2010. Stanford Mobile Phone Orchestra, director and performer.

Stanford University Prospective Student Weekend. March 2009. Part of the final concert at Memorial Church, curated by Steve Sano. Stanford Laptop Orchestra, director and performer.

SELECTED PRESS FEATURES

"Stanford Professor's Music Apps Turns iPhone and iPad into Musical Instruments." NBC's *Rock Center with Brian Williams*. March 2012.

"The Machine That Makes You Musical." (also "YouTunes.") *The New York Times Magazine*. November 2011.

"Digital Giants: Ge Wang" *BBC*. March 2010. (profile and feature)

"Ge Wang: the iPhone's Music Man." *IEEE Spectrum*. September 2009.

"From Pocket to Stage, Music in the Key of iPhone." *The New York Times*. December 4th, 2009. (front page feature story)

"Blow It Out Your iPhone: Ge Wang Invites You to Reinvent Music." *Inventors Magazine Digest*. September 2009. (cover story and feature)

"Virtual Maestro." *Duke Magazine.* July / August 2011. (feature and profile)

"So Many Apps, So Little Time." *The New York Times: Pogue's Posts*. March 2009.

"Mobile Phone Orchestra: Music on the Move." *National Public Radio*. May 2009.

"Hi-Tech Tunes: Stanford Taps Into Music's Future." *MSNBC*. April 2009.

"Leading a Big Parade of iPhone Apps." *USA Today*. April 2009. (cover story and profile)

"Stanford Researcher Uses Cell Phone to Make Music." *Stanford Report*. March 2009.

"Play It Again, HAL: The Stanford Laptop Orchestra Puts the Code in Coda." *Stanford Magazine*. March/April 2009.

"Laptop Maestro Makes Music Apt for the iPhone." *The Age*. February 2009.

"Is That Ocarina Music Coming from Your iPhone?" *Scientific American*. December 2008.

"There's Gold in Them iPhones." *Newsweek*. December 2008.

"Stanford Laptop Orchestra: Musical Macs." *Apple Pro*. November 2008.

WORK EXPERIENCE

2007—present. Assistant Professor. Stanford University. Center for Computer Research in Music and Acoustics (CCRMA) | Department of Music (also Computer Science, by Courtesy). Full-time research and teaching.

2008—2013. Co-founder and Chief Creative. Smule (formerly also SonicMule) Startup company exploring interactive social music leveraging mobile technology; a research platform to bring the visions of social computer music to a wide population.

2001—2007. Graduate Student and Research Assistant. Princeton University. Department of Computer Science. Full-time research; teaching.

Feb—Aug 2001. Software Engineer. The Adrenaline Group. Software Development Team. Designed and implemented distributed architecture for associative client-side database caching in Java; constructed and taught company course in C++, application development, and graphics.

2000 Summer. Software Design Engineer. Microsoft Corporation. DirectX Group, SDK Team. Designed and implemented DirectX 8.0 multimedia samples, and shared sample components (binaries and source code shipped with SDK) using DirectMusic, DirectSound, and DirectInput.

1997—2000. Teaching Assistant. Duke University Computer Science Department. 10-30 hours per week. Guided and helped students enrolled in computer science courses in laboratory work and programming projects in Java/C++, simulations, and graphics.

1999 Fall. Lead Developer and Co-founder. BuyIQ.com (failed E-commerce start-up). Designed and implemented SQL Server database with ASP front-end for consumer research / shopping site, along with authoring/publishing tool and utilities for managing / maintaining web site and database.

1999 Summer. Software Engineer. Evans and Sutherland Corporation. Designed and implemented architecture for GL-Trace, an application for observing and tracing multithreaded OpenGL applications.

1998 Summer. Software Design Engineer. Microsoft Corporation. WindowsNT Development Group. Graphics Device Interface (GDI) Team. Implemented features for color management and test-bed application to flexibly test GDI+.

1998 Spring. Lead Developer (with George Stetten and Visnu Pitiyanuvath). 3D Java / C++ Game Engine. Designed and Implemented graphics / game engine in Java and in C++/OpenGL used in simulation course.

1997 Summer. Custom Programmer / Consultant. Data Systems International. Designed and implemented database software while working directly and extensively with client.

MOBILE MUSIC COMMERICAL SOFTWARE APPLICATIONS

Smule (startup company), Co-founder, 2008. (reaching 125+ millions users)
Ocarina (iPhone app). concept and design, programming (10+ million users)
Ocarina 2 (iPhone app). concept and design, programming
Magic Piano (iPad, iPhone app). concept and design, programming (80+ million users)
Leaf Trombone: World Stage (iPhone app). concept and design.
Magic Fiddle (iPad app). concept and design, programming.
Sonic Lighter (iPhone app). Concept and design, programming.
Zephyr (iPhone app). Concept and design.
I Am T-Pain (iPhone app), creative advisor.
AutoRap (iPhone app), creative advisor, marketing.
Sing! (iPhone app), concept: globe and distributed singing, creative advisor.

ACADEMIC, DEPARTMENTAL, AND PROFESSIONAL SERVICE

Courtesy Appointment, Stanford University Computer Science; 2008–present
Board Member, *San Francisco Symphony Board of Governors*; 2011–present
Committee, Stanford CS+X / CS+Music Joint Major Program; 2013–2014
Stanford CS+Music Joint Major Program advisor; 2014–present
Created and teach three CS and Music crosslisted courses; 2010–present
Stanford Music Dept. Graduate Studies Committee; 2013–present
Faculty Search Committee, Stanford Music Dept. (CCRMA); 2011
Faculty Search Committee, Stanford Music Dept. (Ethnomusicology); 2010
Faculty Search Committee, Stanford Music Dept. (Composition); 2008
Program Committee, *International Computer Music Conference* (ICMC); 2006, 2008
Program Committee, *New Interfaces for Musical Expression* (NIME); 2008
Reviewer, *ACM CHI*; 2010
Reviewer, *International Computer Music Conference* (ICMC); 2004–present
Reviewer, *New Interfaces for Musical Expression* (NIME); 2006–present
Reviewer, *Music Information Retrieval* ISMIR; 2012–present
Reviewer, *Computer Music Journal*; 2006–present
Reviewer, *Leonardo Music Journal*; 2010–present

Reviewer, *IEEE Multimedia*; 2007–present
Member, *Association for Computing Machinery*
Member, *International Computer Music Association*
Member, *TOPLAP* (live coding organization)
Member, *Computer Science Graduate Council* (Princeton); 2002–2007

ADDITIONAL INFORMATION

Spoken languages: English, Chinese (Mandarin)
Citizenship: U.S.
Born: November 1977 in Beijing, China

REFERENCES

(available upon request.)