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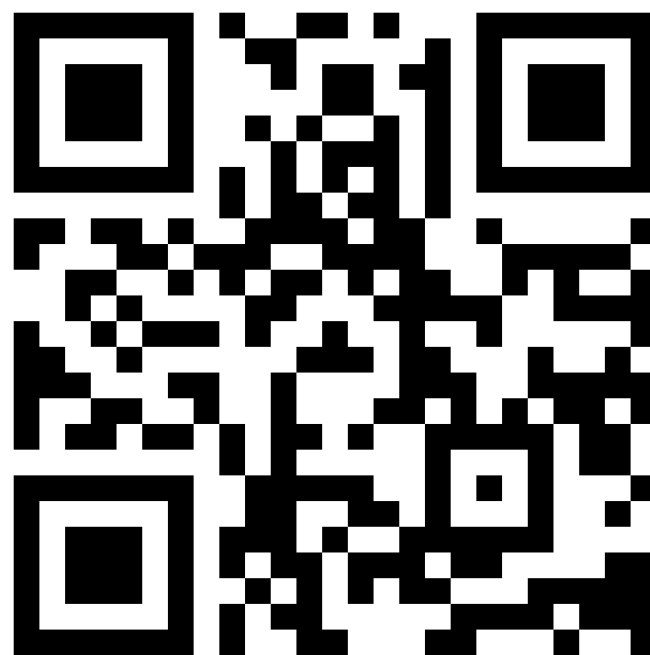
This project was also made possible through the support of CCRMA, Visiting Artist 2019-2020, and a Project Grant from New Music USA.

The **Furies**



<https://laptopera.org/>

Stanford **Laptop Orchestra**



<https://slork.stanford.edu/>



STANFORD
UNIVERSITY

Stanford Laptop Orchestra (SLOrk) presents



World Premiere

Friday (11/11/2022) 7:30pm
Saturday (11/12/2022) 7:30pm
Sunday (11/13/2022) 4:00pm

CCRMA Stage, Stanford University

In-person and Livestreamed

Creator, Librettist, Composer, Co-producer

Anne Hege

Live Visuals Design, SLOrk Director, Co-producer

Ge Wang

Instrument System Design

Curtis Ullerich

Instrument Design Contributors

Camille Noufi, Elena Georgieva, Curtis Ullerich, Anne Hege, Matt Wright

CCRMA Technical Director, SLOrk Co-director

Matt Wright

Lighting, Audio Capture, Livestream, Documentation

Constantin Basica, Jenessa Joffe

Choreography & Stage Direction

Carrie Ahern (2022), Catie Cuan (2019-2020)

Conductor

Cole Thomason-Redus

Cast

Electra — Shauna Fallihee	Maids & Interlude — Elena G. & Camille N.
Aegisthus — Sidney Chen	Tutor & Agamemnon's ghost — Seth Arnopole
Orestia — Anne Hege	Iphigenia's ghost — Elena Georgieva
Clytemnestra — Alice Del Simone	Soldiers — Camille N. & Nette W.

The Furies • SLOrk Ensemble

Seth Arnopole, Elena Georgieva, Camille Noufi,
Curtis Ullerich, Nette Worthey, Matt Wright

The Furies: A Laptera

The Stanford Laptop Orchestra (SLOrk) presents the first-ever "laptera". *The Furies: A Laptera* is a retelling of the Greek tragedy Electra. Blending a number of versions of the Electra story including works by Aeschylus, Sophocles, Euripides, and Jean-Paul Sartre, this retelling explores central questions regarding how communities escape from cycles of violence, the role of guilt and shame in community identity, personal responsibility, how justice interfaces with cycles of violence, and redemption. The artistic medium of the laptop orchestra both serves to recast the traditional instrumental role in a new kind of operatic medium (the "laptera") that reimagines the potential of instrument building to support dramatic elements and character relationships—while simultaneously posing questions about technology in our lives presently, both in its promise to help us flourish and in its perils to perpetuate and amplify the existing cycles of violence in our world today.

Synopsis

Generations of violence have besieged the House of Atreus. For King Agamemnon and his wife Clytemnestra, this begins with the sacrifice of their firstborn daughter, Iphigenia, as demanded by the Oracle to give favorable winds to Agamemnon's fleet as they left Argos to fulfill their duties in the Trojan war. While the King is away, Clytemnestra and her lover, Aegisthus, conspire to murder her husband on his return. After the murder, Aegisthus and Clytemnestra cast out Clytemnestra's secondborn, Orestia, who is found and raised by a wealthy Athenian family. Clytemnestra's third child, Electra, remains in Argos as her mother and stepfather's servant.

Act I: Orestia returns to Argos with her tutor and attempts to find someone to help guide them. She encounters Electra and her maids performing a ritual at Agamemnon's grave and offers to help. Clytemnestra interrupts the ritual. She demands that Electra complete her tasks quickly. Electra complies and covertly asks Orestia to come to the annual ceremony that afternoon. Orestia agrees to attend and then, alone, sings a prayer to Agamemnon.

Act II: The townspeople hurry towards the annual Rite at the Rock, a ceremony honoring the death of Agamemnon and acknowledging the guilt shared by the community. Aegisthus is furious that Electra is late. Clytemnestra attempts to calm him, and they proceed with the ritual without their daughter. Electra interrupts the ritual and suggests they dance and celebrate living rather than guilt. All agree and begin dancing joyously until the ghosts of Argos noisily disrupt the ritual. The townspeople, full of fear, follow Aegisthus back to the palace. Electra remains, and Orestia explains that they are, in fact, sisters. Electra convinces Orestia that to seal their bond and unite them as a family, they must avenge Agamemnon.

Intermission

Act III: Castle guards hear ghostly sounds while on patrol. Aegisthus dismisses the guards and remains with Clytemnestra, wondering how much longer they must bear the weight of their guilt. Clytemnestra retires to bed, and Aegisthus sings a prayer to Apollo, asking for guidance. Orestia interrupts this prayer, killing Aegisthus and Clytemnestra. The Furies—old gods tasked with imposing moral law—prepare to avenge this crime, and the two sisters flee to Apollo's temple for protection.

Act IV: Huddling by the altar in Apollo's temple, Electra and Orestia hope to escape the wrath of the Furies. The Furies, however, surround the sisters and perform a vicious ritual. Electra and Orestia realize they have failed to create the new family they had hoped for by avenging their father. They are alone in the world. The ghosts of Agamemnon, Iphigenia, Clytemnestra, and Aegisthus join the Furies in a final ballet in the hopes of finding an end to this cycle of violence.

Post-performance Q&A discussion



Artist Biographies

Anne Hege (Creator, Librettist, Composer, Co-producer, Orestia) creates musical worlds that invite an awareness of and attention to the body and our present moment. In her work as a composer, vocalist, conductor, and instrument builder, she explores the roots of musicality in the intersection of ensemble interaction, technology, embodiment, and expression. Her works have been performed by So Percussion, New Jersey Symphony Orchestra, Princeton Laptop Orchestra, Stanford Laptop Orchestra, Google Mobile Devices Ensemble, loadbang, Ensemble Klang, NOW Ensemble, Voce in Tempore, Newspeak, Piedmont East Bay Children's Chorus, Resound Ensemble, and Volti SF. From 2008-present, Hege composes musical scores for Carrie Ahern Dance with over 45 performances of these works in locations including the vaults of a Wall Street Bank, a retired Lyceum, and Dickson's Farmstand in Chelsea Market. Hege has received awards and grants, including a New Music USA Project Grant, Mark Nelson Fellowship (Princeton University), Composer in Residence (Resound Ensemble), Visiting Artist (CCRMA, Stanford University), Research Affiliate (CACPS, Princeton University), Elizabeth Mills Crothers Prize (Mills College), Associate Artist Residency (Atlantic Center for the Arts), and a Bay Area Pilot Project grant. Hege is currently an adjunct professor and voice faculty at Mills College at Northeastern University and the artistic director of the Peninsula Women's Chorus. She performs regularly on her analog live-looping instrument, the tape machine, in her electronic duo New Prosthetics, and the laptop ensemble Sideband. Her first album will be released on INNOVA records in the spring of 2023. www.annehege.com

Ge Wang (Live Visuals Design, SLOrk Director, Co-producer) is an Associate Professor at Stanford University, researching the artful design of tools, instruments, toys, games and social experiences. Ge is the architect of the ChuckK music programming language, the director of the Stanford Laptop Orchestra (SLOrk), and the director of the Stanford VR Design Lab @ CCRMA. He is the Co-founder of Smule and the designer of the Ocarina and Magic Piano apps for mobile phones. A 2016 Guggenheim Fellow, Ge is the author of *Artful Design: Technology in Search of the Sublime*, a photo-comic book about how we shape technology—and how technology shapes us. artful.design



Shauna Fallihee (Electra) Mezzo-Soprano Shauna Fallihee has the pleasure of serving Bay Area singers and audiences as a voice and movement educator and active performer. Shauna has been featured with numerous Bay Area ensembles including San Francisco Choral Society, Masterworks Chorale, San Francisco Composers Chamber Orchestra, Open Opera, West Bay Opera and the Old St. Mary's Cathedral Noontime Concert Series. As an ensemble singer, Shauna has performed with American Bach Soloists, AVE (Artist's Vocal Ensemble), Cantata Collective, and San Francisco Renaissance Voices. Deeply dedicated to the performance of new music, Shauna has performed world premieres and contemporary works with Empyrean Ensemble, Facing West Shadow Theater, NothingSet Ensemble, San Francisco Composers Chamber Orchestra, Opus Project, Wild Rumpus, Ensemble Mik Nawooj, Stanford Laptop Orchestra and enjoyed a decade with new music chamber choir Volti.

Shauna has taught voice and related topics for numerous college and high school voice and choral programs. Shauna is presently on the voice faculty at Holy Names University and Las Positas College and maintains a large private voice studio. She is a Master Teacher Trainer for The Dailey Method, an alignment-focused Barre and Cycle fitness program. She holds certifications in Yoga (RYT-500), Myofascial Release, and has pursued deep meditation studies in the Theravada tradition. Shauna's own unique program Embodied Singer integrates movement, myofascial release, meditation, and traditional vocal pedagogy. Her video archive Embodied Online includes over 100 videos of voice instruction and complementary practices. www.embodiedsinger.com

Alice Del Simone (Clytemnestra) is thrilled to perform the role of Clytemnestra in Anne Hege's *The Furies* with Stanford Laptop Orchestra and excited to continue to be a part of this project. Del Simone received her B.A. in Voice Performance from the University of California, Davis. She is currently pursuing an M.M. in Voice Pedagogy and Performance at the University of Colorado Boulder. Recent appearances include The Lady with a Hand Mirror in *Postcard from Morocco* (Argento) with Eklund Opera, Gilda in *Three Feathers* (Laitman) with Opera Steamboat, La Princesse, Le Rosignol, and Le Feu in *L'Enfant et les Sortilèges* (Ravel) with Boulder Opera, La Feé in *Cendrillon* (Viardot) with Loveland Opera's Educational Outreach, and Poppea in *Agrippina* (Handel) with Eklund Opera. She has recently performed with San Francisco Ballet, Volti, Left Coast Chamber Ensemble, Berkeley Symphony, and ODC among others. Del Simone taught music theory and vocal pedagogy for the Piedmont East Bay Children's Choir and currently maintains a small private voice studio. alicedelsimone.com

Cole Thomason-Redus (Conductor) San Francisco born and based educator, performer, composer and conductor, Cole Thomason-Redus has spent over a quarter-century serving the music industry in many diverse ways, highlighting his vast array of skill-sets.. He began singing at the age of seven in the San Francisco Boys Chorus and went on to serve as their Assistant Conductor, in addition to numerous other positions with organizations such as Chanticleer, Ragazzi Boys Chorus, San Francisco Arts Education Project and Ruth Asawa San Francisco School of the Arts. As a choral composer, his works have been enjoyed internationally, including performances by Cantus and the San Francisco Symphony Chorus. Additionally, Cole held a seven-year tenure as Curator of Classical Music at iTunes and APPLE MUSIC and was one of five classical musicologists employed by Pandora Media Inc. as part of the Music Genome Project. He is currently also on staff at the National Children's Chorus and develops educational content and programming for the Department of Diversity, Equity and Community at San Francisco Opera.

Sidney Chen (Aegisthus) Bass-baritone Sidney Chen, whose voice has been described by the *San Francisco Chronicle* as "expressive and richly mellifluous," is passionate about creating new work through collaboration with artists of all disciplines. Recent projects include touring with ODC/Dance as a guest performer in KT Nelson's *Path of Miracles*; premiering Ryan Brown's theatricalized "medical oratorio" *Mortal Lessons*; collaborating with the Friction Quartet on a program of new works for vocal quartet and string quartet; and creating the role of Alex in Lisa Mezzacappa's serial podcast opera *The Electronic Lover*. As a member of iconic composer/choreographer Meredith Monk's Vocal Ensemble, he has performed in Monk's music-theater work *On Behalf of Nature*, which toured internationally and was recorded for ECM Records. With the San Francisco Symphony he traveled to Carnegie Hall to premiere Monk's chamber work *Realm Variations*. He is a co-founder of The M6, a New York-based vocal sextet, which has been heard on NPR and featured in *The New York Times*. In his hometown of San Francisco, he regularly performs with the new-music chorus Volti, and is a member of the acclaimed nine-man ensemble Clerestory. His solo performances often include his DIY music boxes, which were featured in a *SF Chronicle* Datebook cover story. sidneychenarts.com

Curtis Ullerich (Instrument System Design and Laptop Orchestra Player) is interested in the expression of live physical gesture as musical gesture, with forays into live coding, fixed-medium and improvisational electroacoustic music, interface/instrument design, and symbolic systems.

Curtis has performed with myriad ensembles on saxophone, electronics, and trombone, including the Stanford Symphony Orchestra, Stanford Wind Symphony, Stanford Saxophone Choir, SCU's SCLOrk, the Google Mobile Orchestra led by Dan Iglesia, and now SideLObe/SLOrk; he joined Sideband at PdCon 2016 and their 2018 west coast tour. He showcased his undergrad honors thesis work in music HCI (contributions to Virtual Environment Sound Control, PI Dr. Christopher Hopkins) at SEAMUS 2013. Selected projects are at curtis.in/projects/music.

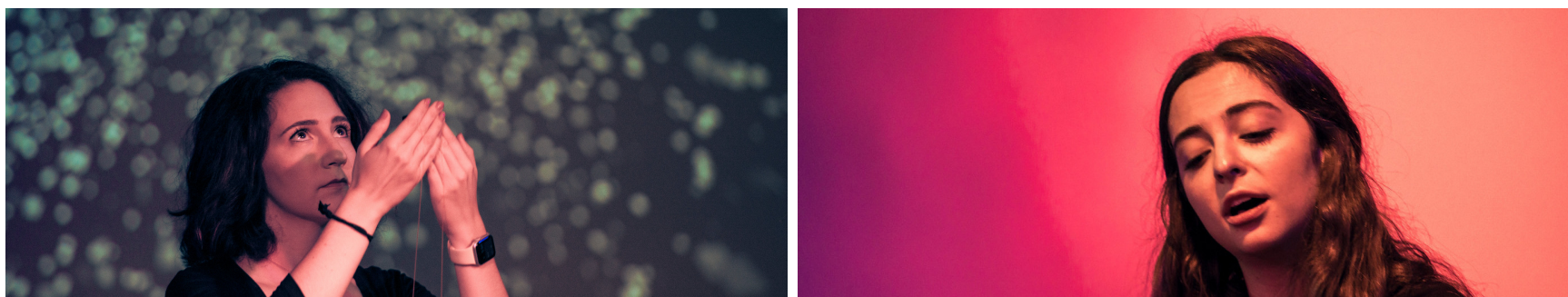
By day, Curtis is a software engineer at Google, where he builds platforms for teaching young people STEM, with an emphasis on symbolic math systems. At other times, you can find him making music, splitting firewood, volunteering with 4-H, or running an ultra.



Carrie Ahern (Choreographer, Stage director) Since 2005, NYC choreographer Carrie Ahern has used the medium of the body to investigate spaces of taboo with her dance company: Carrie Ahern Dance. She has a reputation for extensive research combined with an ability to make viewers deeply uncomfortable and comfortable simultaneously. Current multi-year project: “*Sex Status*” series (2018-present), performed in private homes, open to the public, seeks to expose women in their sexual and quotidian lives. For her multi year project about modern death “*Borrowed Prey*” (2011-2016) Ahern learned to hunt, butcher and slaughter animals to learn more about the animals we consume and worked as a hospice volunteer. “*Ahern’s choreography is striking and original... powerful*” *The New Yorker* Ahern has collaborated with Anne Hege since 2009 beginning with “*SeNSATE*” (2009)—a 3 hour, multi-floored performance installation; “*Borrowed Prey: Part I*” (2012) & “*II*”(2013); and “*Carnal Spill*” (2022). www.carrieahern.com

Seth Arnopole (Laptop Orchestra Player/Chorus/Agamemnon/Tutor) has performed with numerous ensembles in northern California, including the American Bach Soloists, San Francisco Festival Chorale, San Francisco Boys Chorus and Men’s Chorale, Volti, Skywalker Chorus, and the International Orange Chorale of San Francisco. He has worked with artists such as Gustavo Dudamel, Esa-Pekka Salonen, the Kronos Quartet, Meredith Monk, Bob Weir, and Dave Brubeck, and his voice has appeared on several video game soundtracks and film trailers. Seth is also a member of the folk/roots band California Zephyr, appearing on three albums. By day, he is the Graduate Student Services Advisor for the departments of Italian, Scandinavian, and Slavic at UC Berkeley. This is his first experience working with a laptop orchestra.

Elena Georgieva (Instrument Design and Laptop Orchestra Player/Chorus) is a music technology researcher, singer, and vocal producer currently living in New York City, where she is working on her PhD at NYU. Before NYU, Elena taught sound recording at Stanford CCRMA, where she received her masters degree in 2019. Elena studies vocals through music information retrieval, sound recording, and perception/cognition. On the artistic side, Elena enjoys experimenting with vocal sounds to create fun and engaging pieces of music, and sings in choirs and contemporary a cappella groups. Right now, Elena performs with the Sirens of Gotham chorus in New York City, and past groups include Mezzo in New York, and Fog City Harmonia, Convivium, Stanford Counterpoint, UCLA YOUTHphonics, and the UCLA Balkan Chorus in California. Elena has been involved with *The Furies* since 2019 and is excited to be back home in the Bay Area and performing this fall! elenatheodora.com



Camille Noufi (Instrument Design and Laptop Orchestra Player/Chorus) is a vocalist, researcher, and 5th year PhD Candidate in the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University. She is fascinated by the human voice as a means of expressive communication, and by the relationship between one’s experiences and environments and their voice. Her interdisciplinary research utilizes signal processing and machine learning in combination with perception studies and vocal science. She seeks to augment and advance expressive, humanistic, and equitable technological interaction through the power of voice. She studies under advisement of Jonathan Berger and is part of the Music Engagement Research Initiative (MERI). Before coming to CCRMA, Camille conducted voice and audio signal processing research at MIT Lincoln Laboratory. She holds a bachelor’s degree with honors in Electrical & Computer Engineering (BSEE-cum laude) and a vocal performance Music degree (BA) from the University of Colorado-Boulder, where she also directed, arranged and served as sound engineer for Mile 21 A Cappella.

At Stanford, Camille has studied classical voice with Gregory Wait and Wendy Hillhouse and jazz with Joshua Redman. She co-founded the Songwriters@CCRMA group in 2021. She has been involved with *The Furies* as an instrument designer and chorus member since its inception in early 2019 and is thrilled to see it come to life! camillenoufi.com

Nette Worthey (Laptop Orchestra Player/Chorus/Soldier) Born and raised in Northern California, Ms. Worthey has sung with a variety of San Francisco Bay Area vocal groups, including the San Francisco Symphony Chorus, the choir formerly known as Pacific Mozart Ensemble (now Pacific Edge Voices), and the Bay Choral Guild. She currently works as the administrator of Stanford University’s Center for Computer Research in Music and Acoustics (CCRMA) where she is proud to support the crazy cool work of the artists, scientists, engineers, and researchers, and sometimes, when she is a very good person, is fortunate to be able to participate in a fascinating project like a laptop opera.

Matt Wright (Instrument Design, SLOrk co-director, and Laptop Orchestra Player/Chorus) is a media systems designer, improvising composer/musician, computer music researcher, father of an energetic 5-year-old, and the Technical Director of Stanford’s Center for Computer Research in Music and Acoustics (CCRMA). His research has included real-time mapping of musical gestures to sound synthesis, helping develop and promote the Sound Description Interchange Format (SDIF) and Open Sound Control (OSC) standards, computer modeling of the perception of musical rhythm, and musical creation with technology in a live performance context. As a musician, he plays a variety of Middle Eastern and Afghan plucked lutes, Afro-Brazilian percussion, and computer-based instruments of his own design, in both traditional music contexts and experimental new works. Matt has performed in every iteration of *The Furies* since 2019.



Stanford Laptop Orchestra (SLOrk) is a large-scale, computer-mediated ensemble that explores cutting-edge technology in combination with conventional musical contexts—while radically transforming both. Founded in 2008 by Ge Wang with students, faculty, and staff at Stanford University’s Center for Computer Research in Music and Acoustics (CCRMA), SLOrk consists of laptops, human performers, controllers, and custom multi-channel speaker arrays designed to provide each computer meta-instrument with its own acoustic identity and presence. The orchestra fuses a powerful sea of sound with the immediacy of human music-making, capturing the irreplaceable energy of a live performance ensemble and its sonic presence. At the same time, the orchestra makes use of the computer’s capabilities to experiment with sounds, instruments, and new forms of musical expression. Offstage, the ensemble serves as a unique laboratory and classroom that explore music, computer science, interaction design, composition, and live performance. slork.stanford.edu

Acknowledgements

Fernando Lopez-Lezcano, Dave Kerr, Jay Ryan, Christopher Hung Nguyen; and to all who have contributed to *The Furies* along the way, including Brendan Larkin, Monica Covitt, Amy Foote, Andrea Baldioceda, Kunwoo Kim, Madeline Huberth, Mike Mulshine, Raul Altosaar, Jack Atherton, Hassan Estakhrian, Hillary Hermawan, Mark Sabini, Ryan Smith, Cara Turnbull, and Trijeet Mukhopadhyay.

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Mi Chun, Mary Elyn Bahlert, Liza and Chris Klein, Joell Jones, and my husband Grant Tompkins and children Dorothea, Vera, and Johnnie. This project is dedicated to the memory of my brother, John R. Hege, and father, John S. Hege.

Instrument Design Notes

Instruments in *The Furies: A Laptopera* were crafted using the **Chuck** audio programming language, the **Kotlin** programming language, the **Wekinator** interactive machine learning framework. Additional tools include **gRPC** and **Open Sound Control**. The live visuals were programmed using **C++/OpenGL**.