

## Multiplayer Trombone Champ (2023)

Connor Settle, Daniel Rebelsky, Kelly Cochran

Get ready for the laptop orchestra to blurt out some brazen brass blarts! In our custom rendition of the classic video game title, Trombone Champ, we bring the trombone to the game controller in more ways than ever! This game features 12-way multiplayer, with one conductor and lots of voiceovers. Turn your brains on and get your notepads ready, because our spectacular and very accurate Trombone Facts™ will knock your socks off! We hope you survive the toots...

## Zhi Nü Pas De Deux (2023)

(Ft. Madison Yeung & Bradley Moon)

Analiese Bancroft & Tristan Peng

In Chinese mythology, Zhi Nü was a celestial weaving maiden who skillfully crafted exquisite brocade robes for her father, the Jade Emperor, using ethereal clouds. One day, she obtained permission to visit Earth, where she encountered Niu Lang, a humble cowherd. Their hearts intertwined, and they soon married, their love consuming Zhi Nü's thoughts, leaving no space for heaven.

After a time, Zhi Nü returned to her heavenly abode, and Niu Lang followed her, joining her in the realm beyond. However, the Jade Emperor grew furious upon discovering his daughter's prolonged neglect of her weaving duties. As punishment, he separated the devoted lovers, placing them on opposite banks of the insurmountable Milky Way.

Yearning for each other's presence, Zhi Nü and Niu Lang find solace in a bittersweet tradition. Once a year, on the seventh day of the seventh lunar month, their hearts align as the stars align. On this auspicious day, magpies take flight, soaring across the Milky Way, creating a luminous bridge of light. Across this ethereal path, the star-crossed lovers reunite, cherishing a fleeting moment to rekindle their eternal love.

Tonight's instruments are created using the Chuck audio programming language, Open Sound Control, WebChuck, Chunity (Chuck in Unity), node.js, Express server, JavaScript, HTML, CSS, Python, MuseScore, Fluidsynth, Logic Pro X, FL Studio, bash, Google Doc.



**The Stanford Laptop Orchestra (SLOrk)** is a large-scale, computer-mediated ensemble that explores cutting-edge technology in combination with conventional musical contexts—while 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 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. 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 intimacy. At the same time, the orchestra makes use of the computer's capabilities for new sounds and interactions—to imagine and realize new instruments for musical expression. Offstage, SLOrk serves as a unique classroom that explores music, computer science, artful design, composition, and live performance in a naturally interdisciplinary way.

**SLOrk** will return.

## Stanford Laptop Orchestra (SLOrk)



June 10, 2023, Saturday 7:30pm

**Bing Concert Hall**, Stanford University

### Ensemble

Analiese Bancroft | Celeste Betancur | Kelly Cochran | Dominic DeMarco  
Terry Feng | Abhinav Garg | Max Jardetzky | Donghun Daniel Kim | Soohyun Kim  
Yikai Li | Tristan Peng | Daniel Rebelsky | Connor Settle

### Co-directors

Matt Wright and Marise van Zyl

### Director

Ge Wang

### Livestream & Cameras

Constantin Basica, Kunwoo Kim, Dave K.

**Special thanks to the fantastic Bing crew**



### **The Dawn of Computer Music (2023)**

Terry Feng, Soohyun Kim, Yikai Li

Welcome to an epic fusion of Strauss's "Also sprach Zarathustra" and Musique Concrète. This Space Odyssey-inspired performance unfolds in two movements, signaling the dawn of computer music. The first movement dances with invisible orchestral instruments, synthesizing Strauss's iconic sunrise fanfare. The second morphs into a sound collage of space, an interactive composition in Musique Concrète utilizing recorded sound with digital effects. Sit back as we transform Strauss's masterpiece into a unique auditory journey, your SLOrker's guide to computer music.

### **Writer's Block (2023)**

Dominic DeMarco

If ever you need inspiration when writing an essay, perhaps you can turn to SLOrkers! The only side effect is a healthy dose of musical mayhem...

### **Cyberpunk Sanjo (산조) 2023**

*Soohyun Kim*

Computer music meets Korean traditional music. Sanjo (산조) is a Korean traditional music style which involves two players, one on a melodic instrument and the other on percussion. Known for its improvisational nature, it is often compared to Jazz jam sessions in Western music. It also entails a musical conversation between a melodic instrument player and a percussion player.

In this performance, Kim plays his own melodic computer music instrument in the style of Korean traditional music. Using a GameTrak controller, his instrument is designed to express the essence of dynamic vibrato and pitch bend of Korean traditional music. And what he is sitting across from is a "ghost" computer player who provides the percussion component. This Sanjo performance is thereby presented in a form of fusion with computer music, which is unprecedented in Korean traditional music history.

### **Invisible Forces (In Pandora's hands) (2023)**

Celeste Betancur

There is an invisible force controlling SLOrk's computers, phones, and devices; she is making sounds that nobody asked for, strange signs on the screen, instructions, commands, and computer graphics dancing on every screen. Maybe it is a person but what if that person is also being controlled by other invisible forces?



### **Screams in Hell (2023)**

Connor Settle

Have you ever wondered what it sounds like to be in Hell? Are you too impatient to wait until you die to find out? Luckily for you, SLOrk is here to bring a little bit of the underworld to light! Featuring four diabolical demons and eight miserable, suffering souls, this piece will have you praying for forgiveness before you even get halfway through the concert! Get ready to redefine the boundaries of what constitutes a laptop orchestra with a performance that will make you rethink (y)our life choices. May God have mercy on your soul!

### **Bloom (2023)**

Daniel Kim

Bloom started off with the California weather that did not do too well this spring. The unusual torrent of rain in an otherwise very dry area led to the most beautiful mega-bloom just a few weeks ago. Graduating into a terrible job market without knowing exactly what to do, the piece is a wishful metaphor of my life.

### **Giography (2023 Edition)**

Ge Wang

"Giography" is based on an instrument called Intervalia—created in 2014 by Gio Jacuzzi in the course Music 220b: Compositional Algorithms, Psychoacoustics, and Spatial Processing. Here it is reworked into a networked instrument for laptop orchestra. Sounds originate from a single performer typing on the computer keyboard, and emanate throughout the ensemble. This work is named in honor of the creator of the original instrument—and for the spaces it explores.

### **Slorkophone (2023)**

Max Jardetzky

Adapting the classic game of Telephone for the orchestra, we explore the process of self-determination against an environment that rewards conformity and obedience. Let the music show how the tiniest gestures can both harmonize and clash with the uncertain songs of each other's lives.

### **Human Sequencer (2023)**

Daniel Rebelsky, Connor Settle, Abhinav Garg

This piece is in some ways analogous to a bell choir or a boomwhacker ensemble—in these groups, effectively, all the performers are playing "one" (in terms of timbre) instrument, but each is only able to control a limited set of pitches. We flip this idea slightly, allowing the performers greater pitch and timbral control, but with limited rhythmic control: specifically, we explore using a computer to time slice the instrument such that each person is responsible for a given portion of the sequence. We invite the audience to consider the experiential effect of the piece, in contrast to other possible alternatives (e.g., one individual with a pre-made sequence or a time slicing that relied on accurate human sense of rhythm instead of a computer's robotic accuracy).

### **Snowstorm Of My Dreams (2023)**

Kelly Cochran

I'm from Florida (a snow-less place). This piece is about growing up longing for a white Christmas.

*(Continued on back)*

# Bios



**Analiese Bancroft** is a sophomore undergraduate in Material Science and Engineering and MST. She grew up in a Commercial Music program for composing and keyboard studies in Orange County. She is a researcher in the Hong Laboratory for neuromodulation studies and a coxswain on Stanford's Women's Crew. She grew up combining her love for ballet and music and is excited to implement movement and coding. This is Analiese's first quarter in SLOrk and is absolutely loving it!

**Celeste Betancur** I am a live coder and enthusiastic dancer.

**Kelly Cochran** thinks program bios should be in first person. I'm a Computer Science Ph.D. student researching deep learning for RNA genomics who also identifies as a Frank Ticheli stan. I am who I am thanks to years of conducting and playing trumpet, euphonium, and more throughout high school and in the Duke Marching Band and Wind Symphony. SLOrk is my home at Stanford.

**Dominic DeMarco** is a Computer Science cotermin student who loves computer music and algorithmic composition. When he's not SLOrking, you can find Dominic playing trombone for Wind Symphony or conducting the marching band.

**Terry Feng** is a first-year CCRMA master's student researching interactive music-making and musical co-creativity. From building real-time software systems empowering technical and creative expression to composing and performing with elements of traditional and non-traditional practice, he's keen on creating experiences that invite musical participation and engagement.

**Abhinav Garg** is a first-year Master's student in Computer Science, specializing in AI and NLP. He has a deep interest in computer music and recently joined SLOrk to pursue the field. This will be his debut performance and he is excited to explore the world of computer music.

**Max Jardetzky** is a junior on the Computer Science systems track who discovered the interdisciplinary beauty of CCRMA classes in his freshman year. This is his first quarter in CCRMA's MA/MST cotermin program, but his sixth class with Ge Wang: the final Infinity Stone, if you will. In the rare moments when he's not crashing the Chuck virtual machine, you can find Max writing a compiler, brewing specialty coffee, or lifting heavy metal bars in a controlled fashion.

**Daniel Donghun Kim** agrees with Kelly. I am a second-year master's student studying Cyber Policy that loves music and coding. And after hanging out at CCRMA too much, I joined SLOrk during my final quarter. Other than computer music, I love playing the piano, surfing, travelling, and playing all sorts of games.

**Soohyun Kim** is a master's student at CCRMA, Stanford University, whose main research interest lies in human-AI interaction for music production and performance. He is also a music producer and recording/mixing engineer trained in South Korea, who participated in multiple popular music production works. As a musician, he is a guitarist and singer.

**Yikai Li** is a second-year Ph.D. student in the computer science department at Stanford University, specializing in Affective Computing. His research interests center around understanding how visual and auditory signals evoke human emotions. His long-term research goal is to develop a machine that can comprehend human emotions and help experience-based content retrieval and generation.

**Tristan Peng** is a cotermin master's student at CCRMA and a computer science major in human-computer interaction. His research interests span across the academic spectrum, and various projects have led him through various disciplines including computer science, music, genetics, English, psychology, and more. Beyond SLOrk, his other musical pursuits encompass classical and jazz music through piano, saxophone, and voice.

**Daniel Rebelsky** is?

**Connor Settle** is a second-year cotermin in AI and computational biology. At least, that's what is says on his resumé. In reality, he's a stressed out burgeoning scientist trying to find a balance between being a tech bro and a monk. His main research interests are human perception and attaining enlightenment. SLOrk has been an excellent space to learn and express the intersection between technology and art, and he's excited to perform some fun creations!

**Marise van Zyl** is a PhD student at CCRMA and likes long walks on the beach.

**Ge Wang** is an Associate Professor at Stanford University's Center for Computer Research in Music and Acoustics (CCRMA). He researches the artful design of tools, toys, games and interactive AI systems. Ge is the architect of the Chuck music programming language and the director of the Stanford Laptop Orchestra. 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.

Dr. **Matthew Wright** is a media systems designer, improvising composer/musician, computer music researcher, father of an energetic 6-year-old, alopecia survivor, and the Executive 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 traditional plucked lutes, Afro-Brazilian percussion, and computer-based instruments of his own design, in both traditional music contexts and experimental new works.