

Air Sampling - Spatial Sampler XR

A demo proposal for Mixed Realities as NIMEs 2023

by Greg Beller - The Synekine Project



The Fault, 2023

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® Spatial Sampler XR

Innovation, Research, Composition

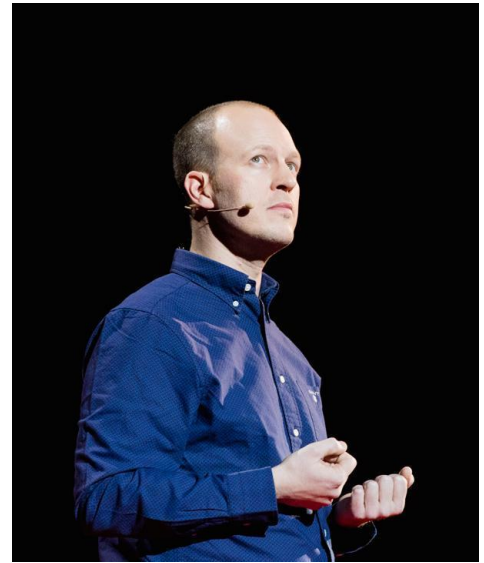
- Title: Spatial Sampler XR
- Part of the [Synekine Project](#)
- Concept & Design: Greg Beller
- Partners: HfMT Hamburg, Ligeti Zentrum, Innolab, Stage 2.0, KiSS Program
- First release: 12th of June 2022

[Spatial Sampler XR](#) is an extension of the instrument series of the [Synekine Project](#). In the same way that a sampler is an empty keyboard that is filled with sounds, Spatial Sampler XR uses gesture capture to transform the surrounding physical space into a key zone for indexing, placing and replaying samples. With Spatial Sampler XR, the musician spreads sound around him/her through gesture, creating a spatialized and interactive sound scene. Movement links time (sound) and space. This makes Spatial Sampler XR suitable for movement artists as well, and for various applications.

The Spatial Sampler XR adds to the [Sound Space](#) the possibility to visualise sounds in mixed reality. The 3D immersion greatly facilitates the organisation of the sounds and increases the precision of the interaction. Several playing modes are possible, the Sound Space, the Spatial Trigger and the Spatial Looper. The interaction modalities also vary according to the type of performance, in solo, duo or with several people. This demo first presents the [Synekine Project](#) from which the concept of Spatial Sampling is derived. Then it exposes and compares the different technical devices that have been elaborated in the framework of this artistic research to arrive at its current state. The technical configuration set up to use the Spatial Sampler XR is presented. The different playing modes are explained. Finally, examples of performative situations allow a look at this new musical instrument.

Greg Beller

[Dr. Greg Beller](#) works as an artist, a researcher, a teacher and a computer designer for contemporary arts. At the nexus of Arts and Sciences at IRCAM, he has been successively a PhD student on generative models for expressivity and their applications for speech and music, a computer music designer, the director of Research/Creation Interfaces Department and the product manager of the IRCAM Forum. Founder of the Synekine Project, he is currently doing a second PhD on "Natural Interfaces for Computer Music" at the HfMT Hamburg in the creation and the performance of artistic moments.



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The Synekine Project

[The Synekine Project](#) is an artistic research project which combines Arts and Sciences. Founded by Greg Beller, sound artist and researcher, the project brings together performers, scientific researchers and developers, in the production of shows halfway between music, dance and theater, in which technique and scenic play enter into a symbiosis. By combining the capture of the gesture and the processing of the voice, new techniques for distributing sound in space are being developed. Arranging your voice in space, making aerial vocal percussions, manipulating loops and generative processes, multiplying the voice through the body. Linking space and time through movement transforms the search for sound into a scenic exploration.

Previous related works:

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Opera, composition

- Title: The Fault
- Type: Opera in 5 scenes and an epilogue
- Music: [Greg Beller](#)
- Text: Frieda Lange and Matthias Piro
- Musical direction: [Chloe Kerou Liu](#)
- Performance: [Marzie Nezam](#)
- Scenic composition: [Greg Beller](#)
- Costume design: [Meret Zürcher](#)
- Video: [Iman Jesmi](#) and [Jacob Sello](#)
- Camera: [Janina Luckow aka KLARA](#)
- Cues and subtitles: Amelie Lopper
- Photos: [Taizhi Shao](#)
- Duration: Two hours
- Premiere on January 20, 2023 – 19:30 – Forum HfMT
- Performance on January 21, 2023 – 18:30 – Forum HfMT
- Streaming: https://www.youtube.com/watch?v=ZY4AB65yx_4
- Tickets: [eventim](#)
- Website link: [HfMT](#)
- More info: <http://www.gregbeller.com/2023/01/the-fault/>

On stage, an artist creates a work before the eyes of the audience. The conflict between the space on display, the set time of the performance, and her creative process raises questions: Is it possible to create for others? Can the relationship between artist, work and audience ever be balanced? And can we observe artistic research without changing it? Composer Greg Beller's doctoral thesis uses new technologies for composition and performance: artificial intelligence, speech synthesis, interactive notation and a new instrument that enables [spatial sampling](#) in [virtual reality](#).



The Fault, 2023

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© The Vanishing Mirror

Composition, Performance, Improvisation

- Title: The Vanishing Mirror
- Type: Composition, Performance, improvisation, air sampling
- Concept and Design: Greg Beller
- With: Dulguun Chinchuluun – Piano, Michael Heupel – Cello, Hanna Weiß – Voice and Greg Beller – SoundSpace VR
- Recording: Taizhi Shao / Das Studio (photo and video credits)
- Duration: 8min
- World Premiere: [seidenstraße vol. 7, ResonanzRaum, Hamburg, 3-4 Dezember 2022](#)
- Production: [Kooltur Connect](#)
- More info: <http://www.gregbeller.com/2022/12/the-vanishing-mirror/>

The vanishing mirror is the third performance in which I play SoundSpace VR, continuing the Air Sampling series. [Air sampling](#) is a series of improvised performances in which a sound source is sampled and distributed in space in real time. In this third performance, the sound source is given by Hanna Weiß to voice. Greg Beller, playing with the instruments [Sound Space](#), [Spatial Trigger](#) and [Spatial Looper](#), records and spreads the samples in space with a VR Headset. Then he plays them in an improvised musical choreography, making with Hanna Weiß a double set, while playing along on his composition for piano, cello, voice and electronics.

© Air Sampling #002

Performance, Improvisation, Spatial Sampling

- Title: Air Sampling #002
- Type: Performance, improvisation, air sampling
- Concept and Design: Greg Beller
- With: [Lin Chen](#) – percussion and Greg Beller – soundspace VR
- Recording: Taizhi Shao / Das Studio (photo and video credits)
- Duration: 12min
- World Premiere: [Blurred Edges Festival, Hamburg, 13 June 2022](#)
- Production: The office for problematic composition
- More info: <http://www.gregbeller.com/2022/06/air-sampling-002/>

Air sampling is a series of improvised performances in which a sound source is sampled and distributed in space in real time.

In this first performance #002, the sound source is given by Lin Chen to percussion and voice. Greg Beller, playing with the instruments [Sound Space](#), [Spatial Trigger](#) and [Spatial Looper](#), records and spreads the samples in space with an Oculus Quest 2. Then he plays them in an improvised musical choreography, making with Lin Chen a double set.



Air Sampling #002, 2022

© Air Sampling #001

Performance, Improvisation, Spatial Sampling

- Title: Air Sampling #001
- Concept and Design: Greg Beller
- Performers: Lin Chen – percussion and Greg Beller – soundspace
- Video: Janina Lukow
- Recording: Taizhi Shao / Das Studio (photo and video credits)
- Duration: 12min
- World Premiere: Blurred edges Festival, Hamburg, 22 October 2020
- Production: Büro für problematische Komposition, Synekine Project, Stage 2.0, HfMT-Hamburg
- More info: <http://www.gregbeller.com/2020/10/air-sampling-001/>

Air sampling is a series of improvised performances in which a sound source is sampled and distributed in space in real time.

In this first performance #001, the sound source is given by Lin Chen to percussion and voice. Greg Beller, playing with the instruments [Sound Space](#), [Spatial Trigger](#) and [Spatial Looper](#), records and spreads the samples in space. Then he plays them in an improvised musical choreography, making with Lin Chen a double set. Interactive video made by Janina Lukow.



Air Sampling # 001, 2020

© Birth of a Tree

Performance, Musical Theater

- Title: Birth of a Tree
- Concept & Design : Greg Beller
- Performer : Lin Chen
- Duration: 12 minutes
- World Premiere: Hamburg, HfMT, 14th of January 2020
- Production: HfMT Stage 2.0 Innovative Hochschule, Synekine Project
- More info; <http://www.gregbeller.com/2020/01/birth-tree/>

The sound creation elaborated during the performance of Birth of a Tree is based on the concept of Spatially Situated Medias. The performer, equipped with a microphone, movement sensors and a camera that follows the position of her hands in space, deposits samples of her voice through gesture in the space that surrounds her, and replays by selecting them according to the proximity of her hands to these positions and by triggering them in aerial percussion gestures. The different sound sources used throughout the piece, a cardboard box, a cutter, screws, pieces of wood, the voice are placed on stage by the performer who plays with the memory of the public in creative gestural lapses. Several virtual instruments are used during the piece to deploy this invisible sound workshop, [the sound space](#), the spatial sampler, the spatial trigger, the spatial sequencer, the spatial looper... These instruments link fragments of sounds to positions in space. Their restitution depends on the movements of the performer. The spatial perception of these sound spaces elaborated on stage in real time, is amplified by a 3D-immersive diffusion based on a dome of 144 speakers.



Birth of a Tree, 2020