

Currents & Tides: An Exploration of Generative Music in Three Acts

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Currents & Tides is an electronic music performance in three acts. The piece integrates digital and analog music, generative audiovisuals and vocals into three distinct parts and expands from stereo to multichannel audio. Each part is an individual musical piece that introduces a unique artistic perspective on generative music and audiovisual interaction. The performance evolves over time through the individual acts, with each subsequent act incorporating elements from the previous one. This way a connection between them is created which culminates in a unified whole, figuratively referred to as interplay between *currents* and *tides*. The performance title thereby also references the workshop series *Making Waves*, during which the individual parts and the overall concept were developed. *Making Waves* is dedicated to exploring music technologies and serves as an experimentation platform for participants from diverse disciplines, including those with and without a musical background, to engage in music-making and live performance.

Joel Schäfer

Filmuniversität Babelsberg KONRAD WOLF, Germany
joel.schaefer@filmuniversitaet.de

Anna Ferro

Filmuniversität Babelsberg KONRAD WOLF, Germany
anna.ferro@filmuniversitaet.de

Elena Vasilkova

Filmuniversität Babelsberg KONRAD WOLF, Germany
elena.vasilkova@filmuniversitaet.de

Andreea-Cristina Mircea

Filmuniversität Babelsberg KONRAD WOLF, Germany
andreea-cristina.mircea@filmuniversitaet.de

Aydin Thil

aydin.thill@filmuniversitaet.de

Lisa Passing

Filmuniversität Babelsberg KONRAD WOLF, Germany
lisa.passing@filmuniversitaet.de

Angela Brennecke

Filmuniversität Babelsberg KONRAD WOLF, Germany
a.brennecke@filmuniversitaet.de

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Background

The electronic live music performance *Currents & Tides* is a result of the *Making Waves* workshop series held within the Creative Technologies Master's program at the Filmuniversität Babelsberg. Making Waves aims to familiarize students with music technologies and the process of music-making itself. Participants have the opportunity to experiment with new tools, learn about various forms of musical or artistic expression, and co-create electronic music. The didactic method is project based and combines theoretical input with hands-on application.

Initially, the workshop focused on exploring the use of AI-based tools for music composition and production. However, at the same time it became clear that the participants had a fundamental interest in making music in a broader sense. The exploration of new musical devices, generative systems or spatial audio in combination with the opportunity to learn about songwriting, sound synthesis or sequencing to create and present their own musical pieces is particularly attractive. The workshop has embraced the concept of 'musicking'¹ to a greater extent and aims to facilitate a holistic approach to crafting, performing and experiencing music as presented by Brown in his discussion on the benefits of meaningful engagement² with music (Brown 2007). Future topics such as live coding or the development of custom instruments using physical computing devices are currently being explored, drawing inspiration from (Hepworth et al. 2019), for example.

Making Waves is open to students from various disciplines; prior knowledge in the field of electronic music is not required. Yet most participants have at least some experiences in musical activities. Each course concludes with a live performance of the pieces developed, which is highly appreciated by the participants and has provided an impetus for the development of *Currents & Tides*.

Currents & Tides

Currents & Tides is an electronic live music performance divided into three individual acts. Each act builds on the previous one and adds a new modality to the performance, driving forward the musical and audiovisual development of the overall piece. The performance is still work in progress and has evolved from an earlier version that was conceived for an anniversary celebration at the Filmuniversität Babelsberg in Nov. 2024.

This initial performance consisted of four mainly independent pieces



Fig. 1. Left: Performance stage with laptops, four Astera Titan Tubes of the lighting setup and projection screen in the background. Right: A modular setup of one of the performers, anniversary celebration at Filmuniversität Babelsberg, Nov. 2024. Image courtesy of Andreea-Cristina Mircea.

of generative music. Three of them additionally generated visuals that were projected onto a screen positioned behind the performers using a near screen projector. To create an overall theme, an audio-reactive lighting concept was introduced. All performers sent OSC messages wirelessly to a lighting console which controlled various light tubes via Touch Designer. This way, the lighting was driven by the individual sonic or visual parts while serving as a common element and providing great ambience (see Fig. 1).

In the revised iteration presented here, the focus is put on a closer conceptual connection between the individual parts. The first act begins with beat-heavy drone sounds designed to connect performer, space, and audience. The second act builds upon this foundation and adds a visual layer that integrates with the music. In the third and last act, the sound field opens up into the audience space with the use of multichannel playback and live vocals. The performance thus evolves from stereo sound to an audiovisual experience into spatial audio with live vocals, all while preserving the uniqueness of the individual artistic approach and the respective exploration of generative music.

Act I | Tidal Drift

Tidal Drift by Kontrol Voltaj (Elena Vasilkova, see Fig. 2) provides the fundamental layer for *Currents & Tides* and acts as an atmospheric element designed to immerse the listener. It functions as a means to experiment with different techniques in generative composition, sound design and synthesis. As the rhythmic, harmonic, and textural base of the performance, the sonic framework sets the emotional tone and atmosphere.

Central to this approach is the use of modulators that influence each other in a feedback-inspired system. By modulating each other, the sound elements form a self-sustaining network, driving continuous change and organic evolution. This allows for complex textures, where sounds emerge, interact, and dissolve organically. Extensive use of reverberation further amplifies spatial depth. Rhythmic ele-



Fig. 2. Kontrol Voltaj (Elena Vasilkova) performing at Filmuniversität Babelsberg on the occasion of the 70th anniversary celebrations, Nov 2024, in Potsdam. Image courtesy of Andreea-Cristina Mircea.

ments, constructed with generative sequencing, randomness, and modulation, maintain unpredictability and flow, while melodic fragments feed into each other, sometimes fading and re-emerging, creating a sense of constant transformation. The work draws inspiration from a variety of electronic genres, including ambient, drone, noise, techno, and electro, blending these influences into a cohesive, immersive sonic environment.

The development of this layer was highly experimental, with a focus on sound design, improvisation, and iterative refinement. The Torso T-1 generative sequencer acted as the “brain” of the composition, driving evolving rhythms and melodies with inherent randomness. Sound synthesis, granular processing, and real-time modulation created rich textures, while reverberation and feedback systems enhanced the immersive experience. As sound sources, software synthesizers on PC and iPad were utilized, contributing to the versatility of the sonic palette and including applications such as Opal by Fors, Arturia Pigments or Tera Pro.

Act II | Multimodal Recursions

Multimodal Recursions by Joel Schäfer and Anna Ferro (see Fig. 3) aims to engage the audience with both audio and visuals. The piece is composed of three chapters: starting from an atmospheric and harmonic setting, it evolves into a more technologized realm of glitches, digital errors and punchy drum breaks, before dissolving into abstract soundscapes inspired by noise music. The approach aims to go beyond audio reactivity as a method of multimodal expression, but rather to create a deep entanglement of auditory and visual synthesis and processing techniques. This is achieved through a non-hierarchical, interconnected modulation system, where visual parameters control sound parameters and vice versa in an experimental audiovisual dialogue.



Fig. 3. Joel Schäfer (left) and Anna Ferro (right) performing with collaborator Elisabeth Scholz (middle) at Filmuniversität Babelsberg on the occasion of the 70th anniversary celebrations, Nov 2024, in Potsdam. Images courtesy of Andreea-Cristina Mircea.

This artistic practice emerged from the experimental development of each individual chapter, loosely interconnected to form an uncertain yet harmonious audiovisual journey. By using feedback loops between sound and video, the two elements dynamically interact, introducing unpredictability into the composition. The generative dimension arises from real-time analysis of the audiovisual content, which is fed back into the synthesis process, creating cyclical interactions where rhythmic glitches and patterns manifest simultaneously across both domains. The system continuously analyzes and reintegrates the outputs, forming an ever-evolving feedback loop in which sound and visuals reciprocally shape the work's shifting identity.

On the musical side, this approach was developed using a custom modular synthesizer system, an electronic drum machine, a tongue drum with a pickup microphone and several digital audio effects such as reverbs and granular processors from within the Ableton Live DAW. The visual aspect was developed through algorithmic and generative video using Touch Designer and controlled by a MIDI controller. In addition, a network switch is used to transfer data via the UDP-based Open Sound Control protocol, allowing the bi-directional sending and receiving of modulation data and triggers within the entire audiovisual system.

Act III | Hybrid Rituals

Hybrid Rituals by Vocalist *NINANIÑA* (Andreea-Cristina Mircea) and visual artist-producer *Ay Din* (Aydin Thill) bridges tradition and technology and forms a dialogue between human expression and digital transformation. Historically, rituals often fostered collective experiences and this is what the final act reinterprets. The human voice is used to directly interact with and reshape a generative virtual world; natural and digital merge into a fluid, responsive environment (see Fig. 4).



Fig. 4. The environment scene created with UNREAL Engine for the final act *Hybrid Rituals*.
Image courtesy of Aydin Thill.

The act draws inspiration from traditional vocal practices from various cultures around the world. At the core of the act are NINANIÑA's live vocal improvisations. The vocals are transmitted from Ableton Live to Unreal Engine, where they serve as dynamic triggers, orchestrating the movement of virtual avatars. This interplay transforms the voice into an agent of generative composition, expanding the performance into a participatory exchange between human and digital entities. Throughout the act, visual and sonic elements from the preceding two performances are subtly reintroduced – either as hidden reference embedded within the digital landscape or as sampled material woven into the musical composition. This creates a cohesive narrative thread across the three individual acts.

A key element of the final act is the shift from stereo to four-channel audio. This change is designed to enhance the transition from a one- or two-dimensional sound and audiovisual experience to a multi-dimensional space, the hybrid realm. Here, the collective extends beyond the physical, incorporating digital embodiments that respond to musical and environmental shifts. The performance space is designed using the Unreal Engine, with generative audiovisual elements reacting in real time to the evolving musical structure. A modular Ableton Live setup incorporates spatial audio, microtonal scales, and live sampling, immersing the audience in an unfolding sonic space that bridges ancient practices and future technologies.

Conclusion

The performance *Currents & Tides* shows the wide array of musical possibilities that a hands-on workshop format like *Making Waves* can put forth. Through exploration of different tools, personal inspirations from the entire spectrum of electronic music, and groups' influence on each other during the formation process, the participants created very unique and forward-thinking pieces.

One challenge that arises from the freedom of the process is the one of sculpting a cohesive performance for the audience. In the anniversary celebration performance coming out of *Making Waves*, audio-reactive ambient lighting was employed to achieve this cohesiveness. This was effective but lacked a coherent dramaturgical thread. To address this, *Currents & Tides* puts focus on the conceptual side of the performance as a whole. The individual acts form a multimodal experience that evolves from stereo to four-channel experience, engaging with various generative music, audiovisuals, and live vocal improvisations. While this work is still in progress, the performance has moved beyond a mere sequence of individual parts. Future iterations may further integrate the previous light art approach with new ideas.

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Gen AI. The authors used ChatGPT and Deepseek for spell-checking, better wording, translations.

Notes

1. The term 'musicking' was introduced by Christopher Small in his work "Musicking: The Meanings of Performing and Listening" and addresses the interdisciplinary and socio-cultural aspects of music making, presenting, and experiencing (Small 1998).

2. Brown identifies five aspects by which students can be engaged with music, i.e., appreciating, evaluating, directing, exploring, and embodying, all of which are increasingly included into Making Waves lesson planning.

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