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# Strip & Embellish

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*Strip & Embellish* is a young experimental live sound project founded in 2022 by computer music duo Daniele Pozzi and Hanns Holger Rutz. Both have developed specific, individual digital instruments based on the SuperCollider sound synthesis language which are strongly linked together by plugging each other's sound signal into many nodes and entry points of the opposite system, creating essentially a complex non-linear feedback process. The project frames electronic music improvisation as a form of parallel collaborative musicking, whose computer-mediated synergies are subject to experimentation through the development of idiosyncratic software tools and strategies that introduce asymmetries, deviations and interruptions in the performance.

**Keywords:** Computer Music, Improvisation, Systems Coupling, Parallel, Collaboration.

## Overview

The *Strip & Embellish*[1] project is centred around the iterative coupling of two computer music systems, individually developed by Daniele Pozzi and Hanns Holger Rutz. Previous performances include *impuls minuteConcerts* Graz and *Piksel* Bergen 2022.

The project is set up as a dialogical situation (Fig. 1), in which the two systems are conceived to be open for interaction. Even though they were not designed to work together in this specific constellation, they both provide software structures for communicating with other systems or instruments. *Strip & Embellish* indeed develops through parallel iterative gestures of reconfiguration, in which the authors collaboratively experiment with multiple strategies, composing specific performative situations and conditions which are scored over time, while remaining open to ongoing intervention. *Strip & Embellish* is about creating a shared environment in which interactions can take place, things can come together, while at the same time each performer — and each system — maintains its own space and individuality.

**Figure 1:** Rehearsal in the Experimental Lab of the KUG's Doctoral School for Artistic Research (2022).

Pozzi's system *Strip* consists of a SuperCollider framework for designing recursive phase modulation (PM) synthesizers. A main focus is

1. https://www.danielepozzi.com/strip+embellish

on feedback experimentation in PM synthesis: *Strip* includes a set of interfaces for real-time signal routing that allows to prototype complex feedback paths and system couplings on-the-fly. The name derives from the fact that the framework is the result of a continuous effort to strip down a complex feedback driven system, while maximising its expressive richness.

Rutz's system *Embellish* is an extension of his live improvisation interface *Wolkenpumpe* (Fig. 3), which in turn combines the SuperCollider sound synthesis engine with a visual graph display with pan and zoom control and automated layout. This interface is extended by performer issued actions to "return in time" and yielding control to the machine for replicating the performance's "hull" structure, now interacting semi-autonomously with new sound situations.

The two system are densely linked together by plugging each other's sound signal into many nodes and entry points of the opposite system, creating essentially a complex non-linear feedback process. Sound input is taken from the other player's system and fed into different stages of digital signal processing (DSP) and analysis, from relatively simple coupling to parametrising complex sound synthesis structures obtained via genetic programming. This creates a shared configuration in which the two systems become intrinsically interdependent: the sounds and actions performed on one system will inevitably affect the other, in a complementary movement of coming together while maintaining a certain performative distance. This friction is crucial to the *Strip & Embellish* project: it creates a form of computer-mediated instability that favours the process of experimenting with those collaborative aspects that are central in electronic music (duo) improvisation.

## Asymmetries and Interruptions

Besides the affordances introduced by coupling two idiosyncratic systems with variable indirectness, we also develop strategies to experiment with the performance temporalities, by either inserting interruptions, strange automation or asymmetries in the shared musical time.

Pozzi's *Strip* incorporates a system for storing specific feedback configurations in a sound and text database. Every entry corresponds to a set of 18 variables representing the coefficients of a 6×3 feedback matrix. Each matrix defines both a specific DSP process (a specific recursive PM synthesiser), and the relationship this process has with the sound it receives from Rutz's system. Entries are collected while playing, they are stored in the database and can be recalled at any time during the performance. When a specific entry is recalled, it creates an abrupt change, or interruption, in the musical time: the phase modulation synthesizer is instantly reconfigured to match

a previous setup. Due to the difference in the incoming signals, however, the synthesised sounds will never match those that were generated originally. A graphical interface may be used to display the database by representing its entries' coefficients in greyscale, allowing a rather intuitive visual selection of previous states, and the possibility of recalling them with a click (Fig. 2).

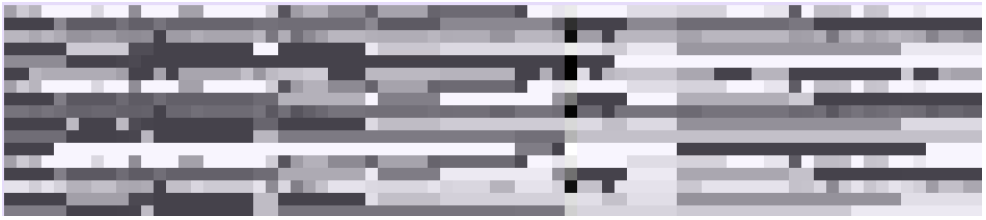

**Figure 2:** Screenshot of a *Strip* dataset visualization.

In Rutz' *Embellish*, the actions of the performer — the creation, deletion, interlinking and dynamic parametrisation of sound building blocks — are recorded to an internal temporal database. After a certain period of time, the performer issues the command to return to a previous point in time, essentially replaying the structural development or "hull" of this player's part. Since in this project, Rutz' sound actions are strongly based upon embellishing the sound signal of Pozzi by non-linear augmentation through various forms of analysis and structural patching, the "return in time" is indeed a strange repetition of an "empty" structure which processes the new live signal. The situation thus created may still be perceived by the audience as a recurrence of past gestures, but the now unforeseen processing of new sounds transposes the original improvisatory part, in which the embellishment was created by Rutz through listening and auditory feedback, to a new machine expression beyond the performer's control. This kind of stubbornness produces a new and different voice from the human performer. Rutz then carefully begins intervening in this structural repetition, possibly issuing another return in time at a later point, thereby producing a recursive layering of embellishments.

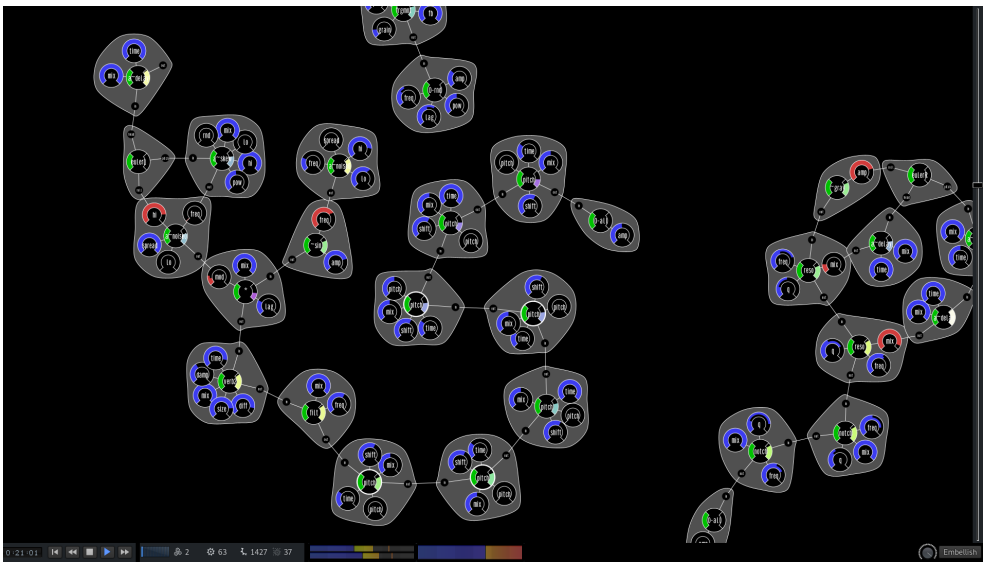

**Figure 3:** Screenshot of *Embellish/ Wolkenpumpe*.

This asymmetrical development from a more directly human-controlled to a less controlled machine expression is reflected in the use of sensor data: in the first part of the performance, Pozzi wears wristbands (Fig. 4) with inertial measurement units (IMU), whose spatial orientation and acceleration are produced mostly unconsciously while playing his system. This data is also part of Rutz' embellishment process, and contrary to the audio data is recorded along with the performative actions. When the command is issued to go back in time, the sensor data from Pozzi's wrists is replayed. Pozzi now passes the wristbands to Rutz, making the formal section apparent to the audience, and in the subsequent part of the performance, this data, again mostly unconsciously produced, is used as live entry point to Pozzi's system. The sensors thus introduce another form of asymmetries in the performance and enable processes of "collaborative sound sculpting", pushing the performers further away from being able to fully control the unfolding situation.

**Figure 4:** Sensor wristbands.

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