Anemone Actiniaria is an algorithmic improvisation duo founded by Hanns Holger Rutz and David Pirrò. In it, they couple computer systems and introduce semi-autonomous agents. As an artistic research project, the seemingly well-defined concept of algorithm is subject to a new reading based on material agencies. Mutual observation and overwriting is initiated between our systems, Wolkenpumpe and Rattle, rooted in physical modelling and in the generation of parametric models based on machine learning. This is inspired by the notion of an emergent new machine through ‘orientation’ and ‘composition’ as outlined by Heinz von Foerster and Dirk Baecker, whereby the functions of operators and operands of the formerly separated systems begin to vacillate.
1 OVERVIEW

*Anemone Actiniaria* is centred around one apparently simple proposition: that a sound object moves from one player to another, is dismantled and reconstructed and spatially represented. All writing processes are characterised by an immanent spatiality. In our case, they are rooted in two open source software systems, *rattle* and *Wolkenpumpe*. These systems, while used in live improvisation, are characterised by a certain autonomy through which they become actual performative agents rather than remaining an “instrument” to be played by the human musician. We are interested in the differential movement of algorithms, their potential to generate spaces that are not solution spaces to a given problem but topographies of the material traces of a composition and improvisation process.

Rutz’s system *Sound Processes* interlinks with the compositional and performance process by providing a memory model of musical objects that traces their historic trajectories. As a sort of integrated versioning system it operates on a database that stores the evolution of sound objects. A special live performance interface *Wolkenpumpe* is constructed on top of this framework (Fig. 1). In the project *Anemone Actiniaria*, sound input is taken from the other player’s system and fed into different stages of DSP treatment and analysis, from relatively simple coupling to decomposition using genetic programming of sound synthesis structures that are matched with the input sound.

*Fig. 1. Wolkenpumpe.*
Pirrò’s system *rattle* (Fig. 2) is a mass-based dynamic systems modelling server. Models can be built by adding, placing or removing particles, defining their properties (e.g. mass, attrition etc.) and linking them to each other using forces or constraints. These functions can be freely defined, offering the possibility to realise a great variety of dynamical systems ranging from mathematical models describing simple physical systems to non-linear chaotic systems. In *Anemone Actiniaria*, sound input is taken from the other player’s system and fed into the physical model, building new phase spaces from analysis of this input. As a result, the system can adapt to timbres and rhythmic structures from the other player.

**2 COMPOSING SYSTEMS**

This way, a sound emitted by one player may now modulate or even produce the sound of the other player, with a varying degree of indirection that is capable of producing highly unexpected new sound structures. The “imperfect reconstruction” of sounds across system boundaries leads to an intrinsic form of spatialisation. This is a spatialisation that does not exist independently from objects, an approach that has been criticised (Eckel et al. 2012). We are not concerned with spatialisation as the attachment of positions and trajectories in a virtual space
to such existing objects, nor are we concerned with the construction of acousmatic spaces in the first place. Instead, we take spatialisation as an algorithmic strategy through which multiplicities are rendered as co-presences in a performance.

The more we acquire experience in this compound feedback system, the less accurate it becomes to speak of a co-modulation of sounds. What we observe is a drift towards something like a Foersterian double closure where the two systems we develop become oriented and aligned with another (Foerster [1993] 2003). The production of one system is not only heard by an audience but translated into parameters of the other. Each player will have to give up something in order to gain something else, in order to let the new machine compute its own reality based on the transformation of its support structure (Baecker 1996). Although the coordinates of the project are still in flux, we have already encountered a configuration where a perplexing refraction and assimilation of sound across the system boundaries occurs, a configuration where we can start to step back and become observers and inter-actors rather than the intenders.

We are currently experimenting with a live video system that captures this kind of assimilation (Fig. 3).
REFERENCES

