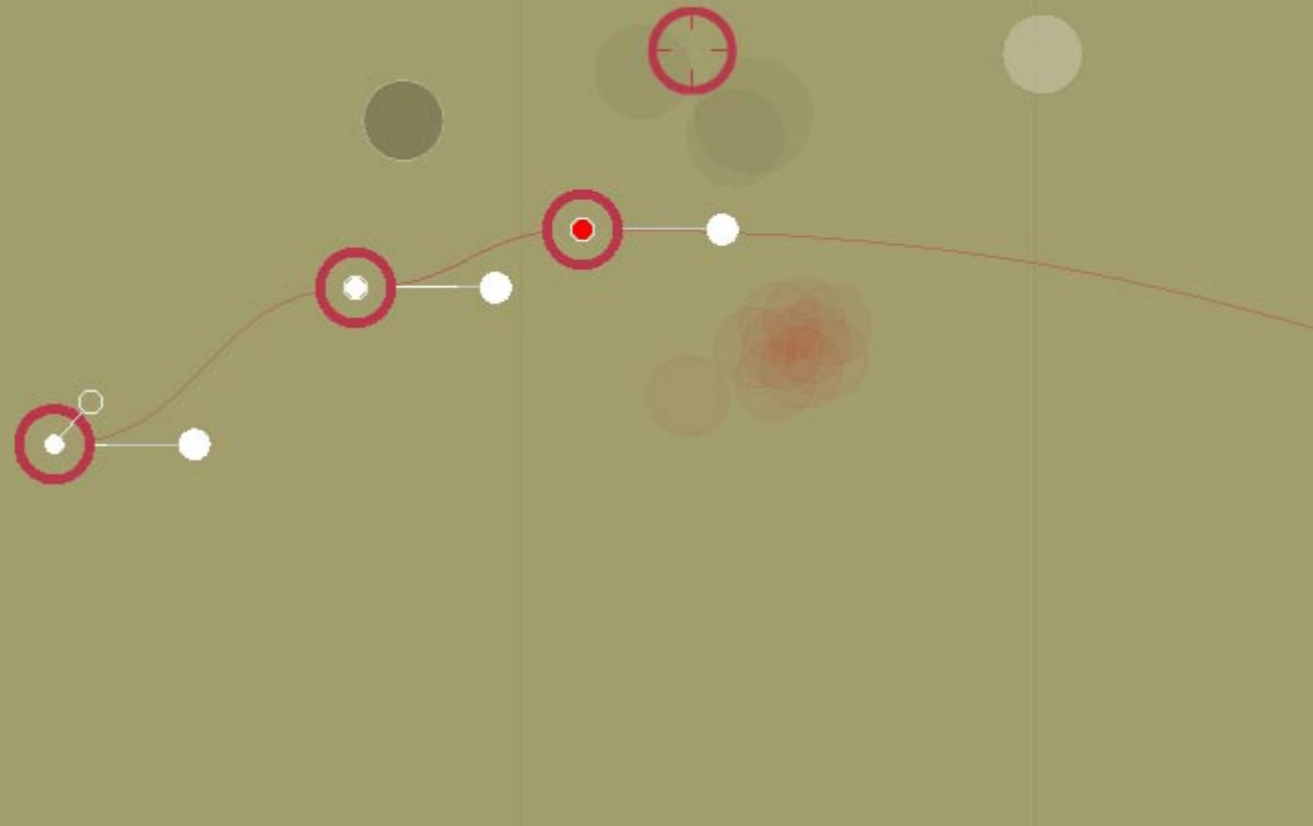


loopArena

agentbasedgenerativemusicinterface



concept for a new interface type

■ agent based: every element acts autonomous

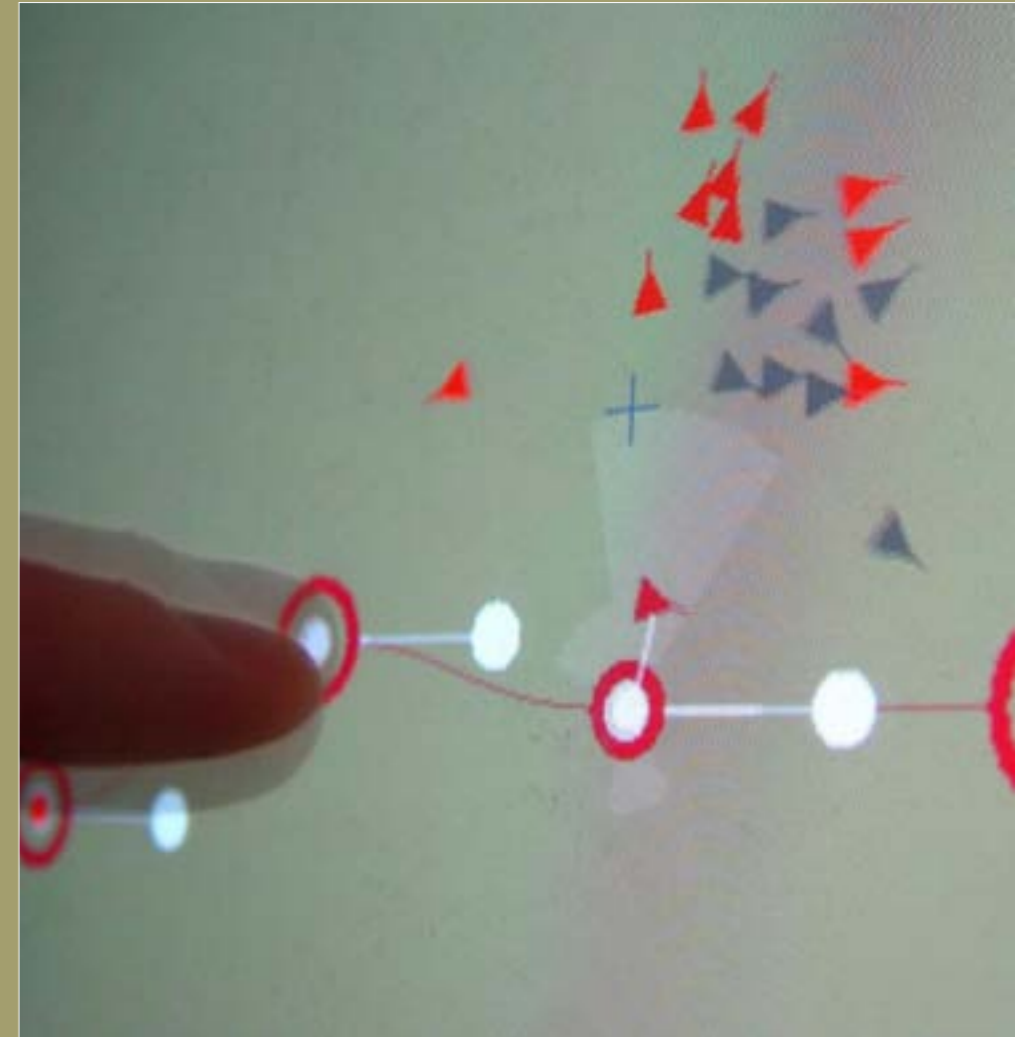
loopArena is a generative music interface for live - performance of loopbased computer music.on a **touchscreen**, the user is able to control eight MIDI-Instruments such as Sythesizers or Samplers (Soft- and Hardware) and a DrumComputer in a **playful way**.

Every Element of the Interface is an **Agent**, which means it is enabled to act autonomously. The Agents are programmed to generatively alter the music loop, help the user create harmonic melodies and at the same time to **inspire** the user and animate him to interact with the agents.

No Typography, rasters and tools are used,
interaction is limited to dragging objects with the fingertips.

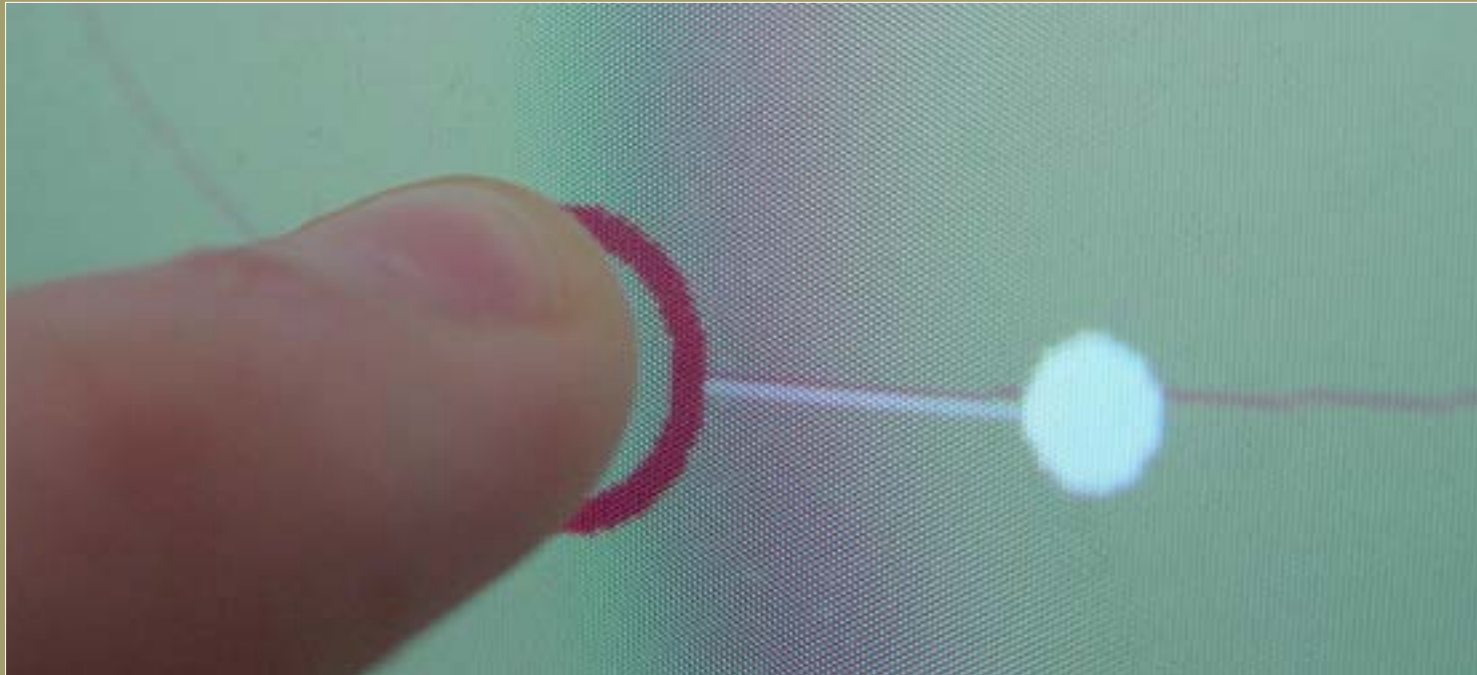
Every moving element has a function, the „toolbar“ is constantly changing.

Musical alteration of the Melody is visible to the user.



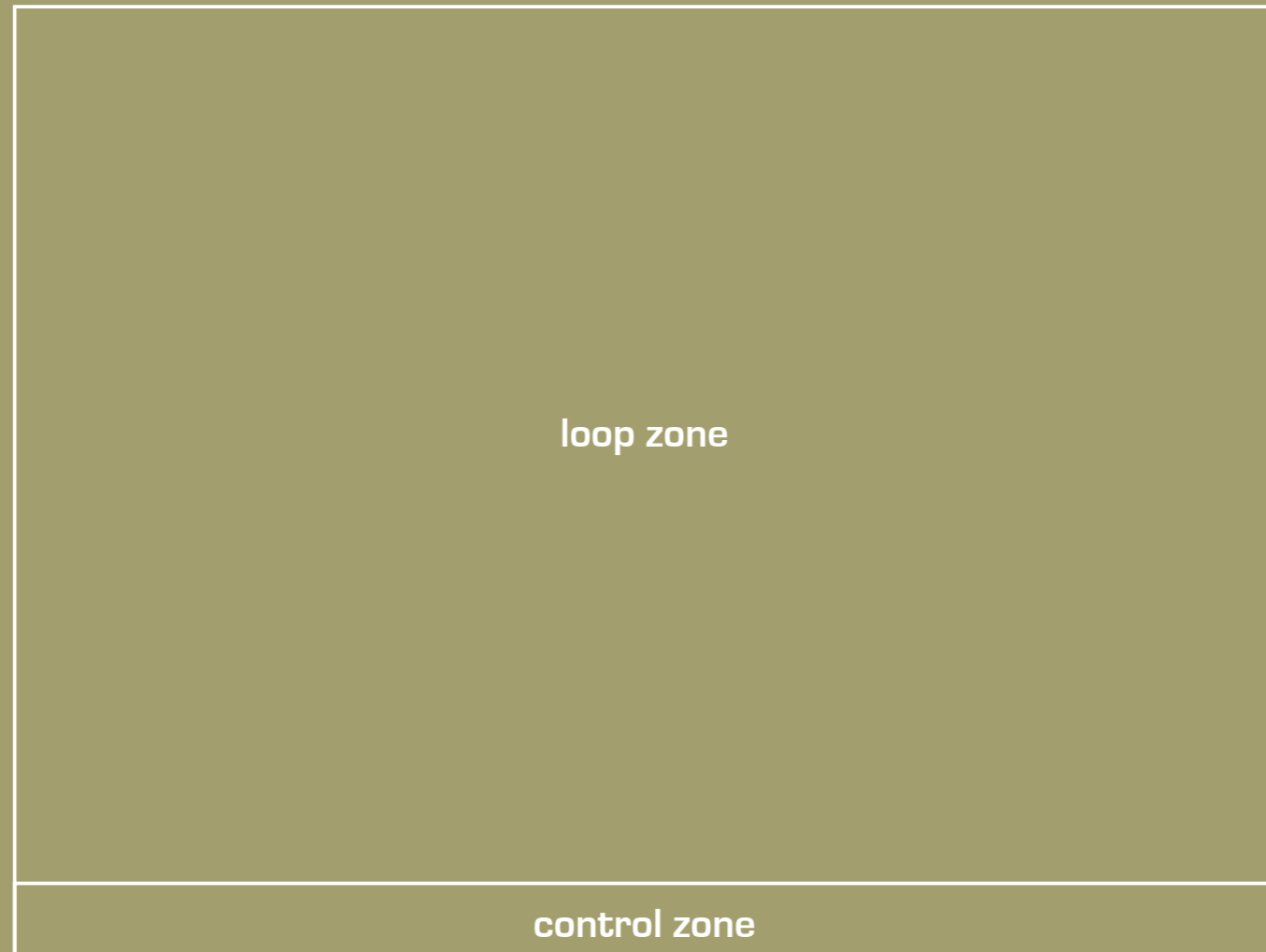
the interface

- touchscreen as a direct way to use the elements
- interaction works by only clicking



the interface

■ stage



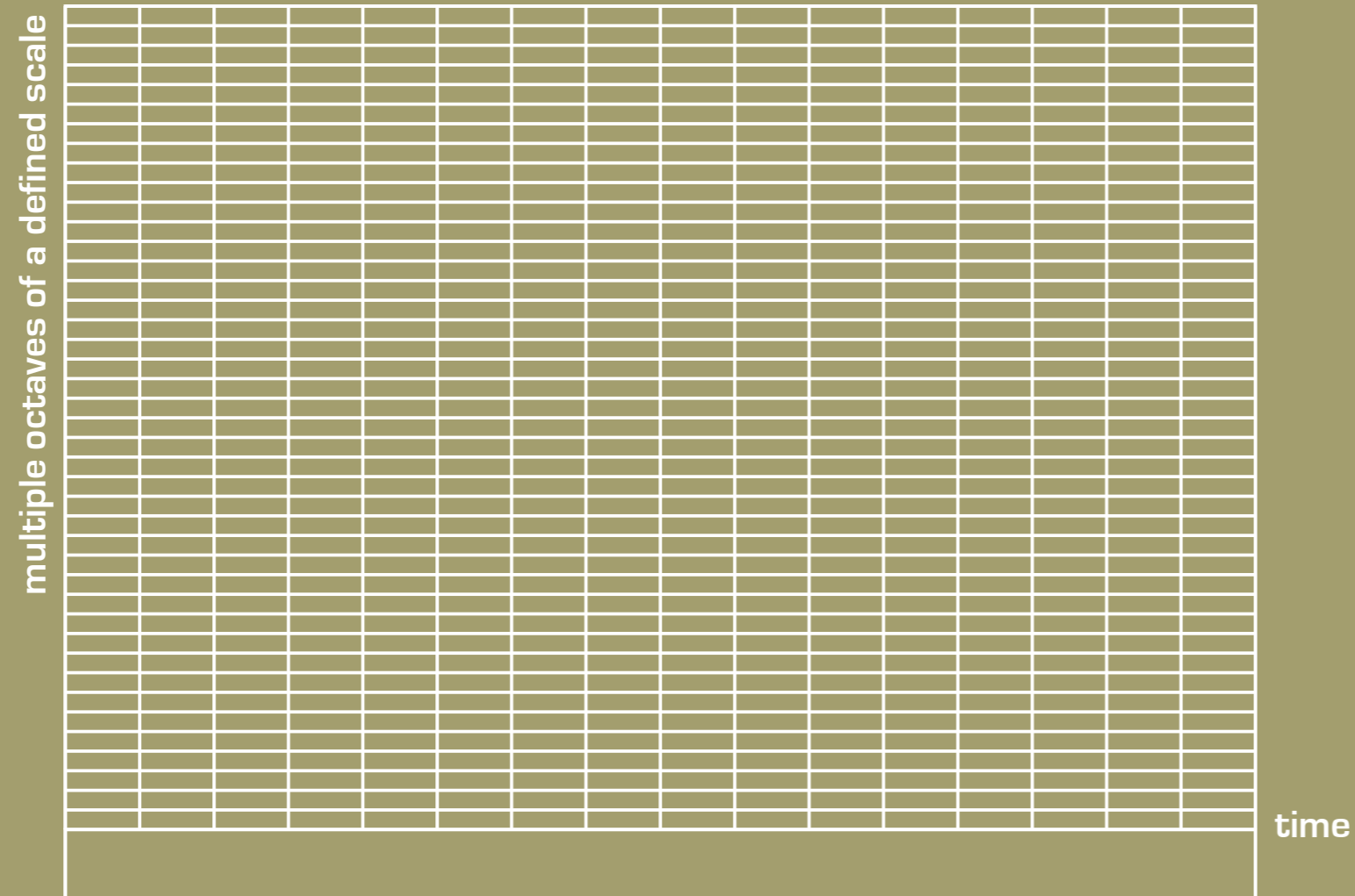
Since loop-based music is the kind of music that originated when computers became musical tools, loopArena generates only a **loop** of one bar length.

The Stage spreads over the whole Screen, the upper „loop zone“ is where the agents move and create the melodies and beats.

In the lower „control zone“ are some static controllers.

the interface

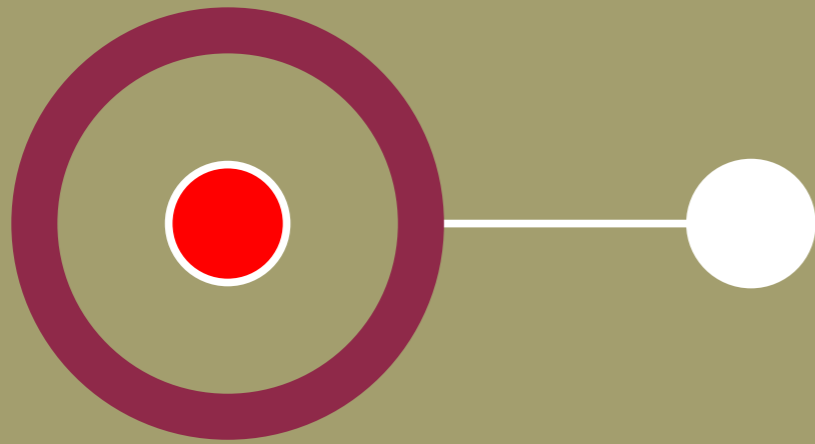
■ stage



Invisible to the user the loop zone is divided by a vertical raster of notes of a predefined scale and a horizontal raster of 16 $\frac{1}{16}$ beats, which are sequentially triggered and form a whole Bar.

the interface

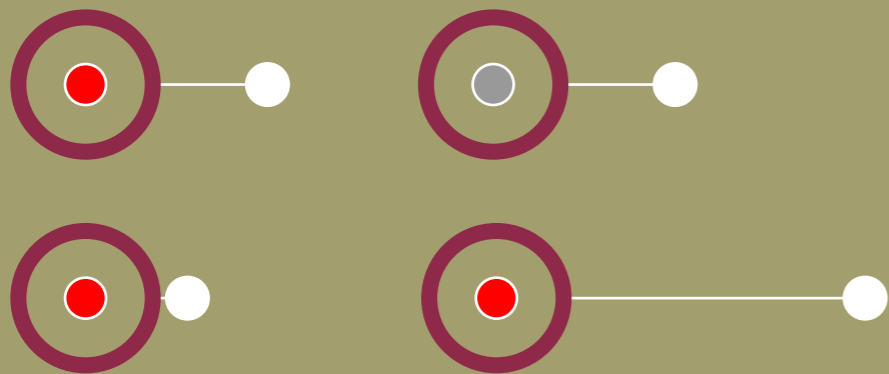
■ main agents: noteAgent



There are two main types of agents:
beatAgents and noteAgents.

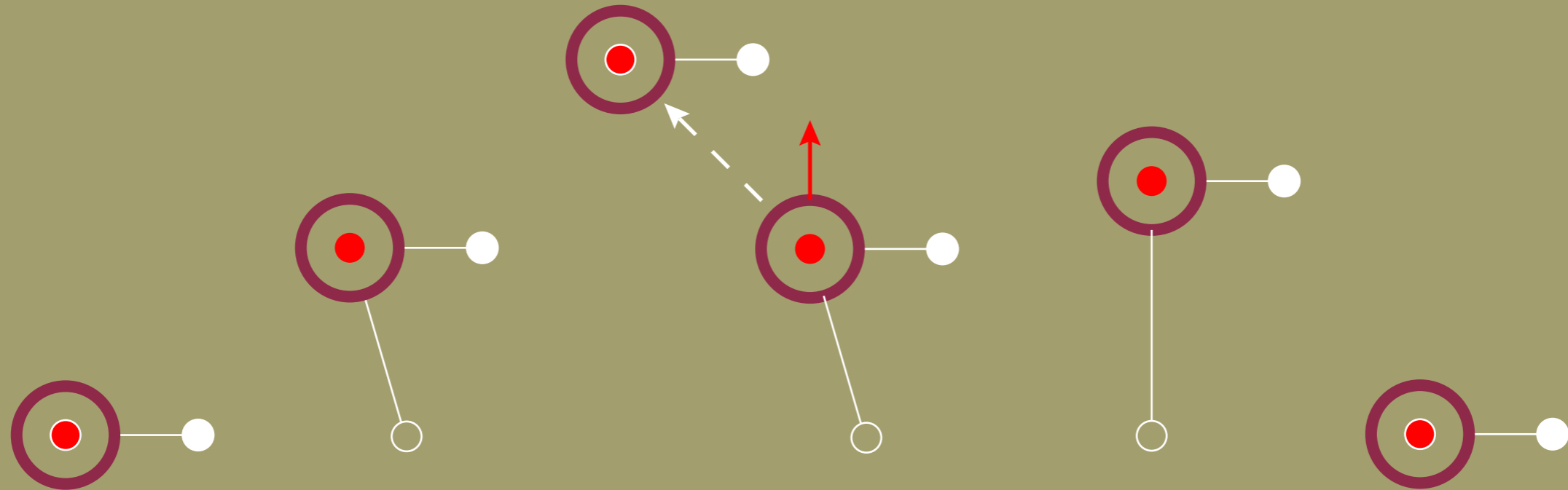
NoteAgents play MIDI Notes depending on their
horizontal and vertical position in the
loop zones raster. They can be dragged and
activated and deactivated by clicking them.

noteAgents have an additional handle which
controls the duration of the played Note.



the interface

■ noteAgent: behaviour



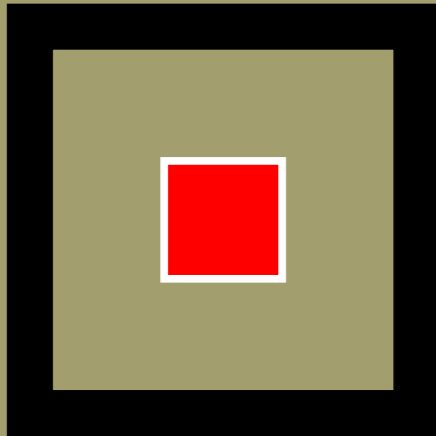
The NoteAgents have the most **complex behaviour**: they constantly count the played beats, after a random number of beats they move in a random direction for one beat, then **check the other agents' positions** and move to a point where they would play a note in a harmonic interval to the previously played note.

After eight bars, all agents return back to the position where the user dropped them on the stage, playing the „motive“ of the melody.

Due to this, the musical result is **not random**, but plays around the users' input.

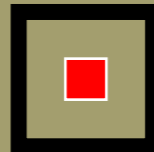
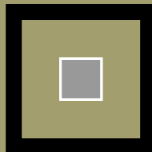
the interface

■ main agents: beatAgent



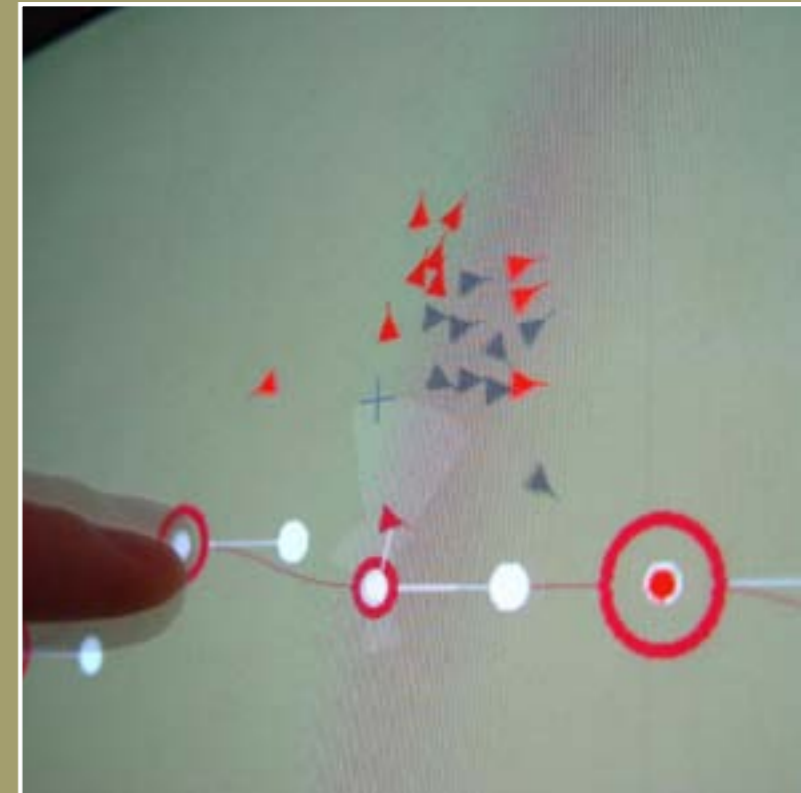
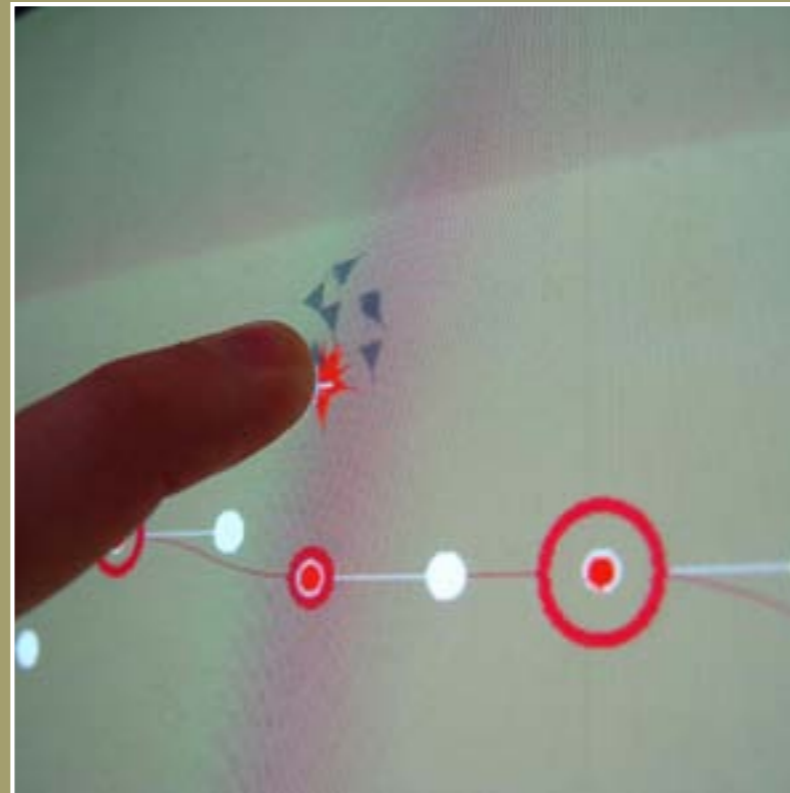
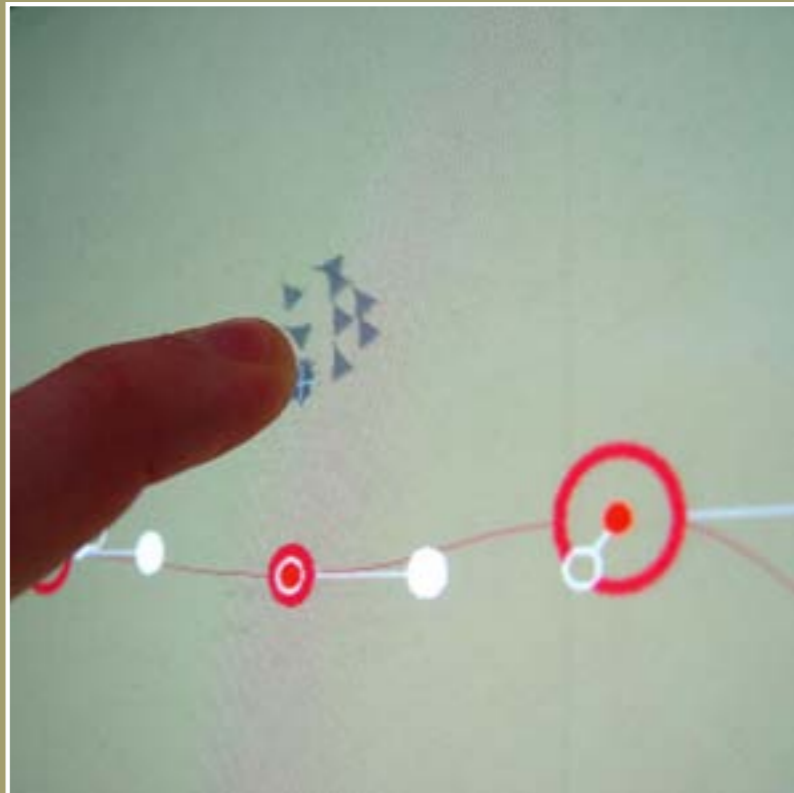
BeatAgents play drums depending on their horizontal and vertical position in the loop zones raster. They can be dragged and activated and deactivated by clicking them.

The loop zone is divided vertically into a raster of 10 possible drums.



the interface

■ helper agents



the helper agents are what normally would be switches, faders or any other tool: they have the ability to influence the melody by changing velocity, position and status of any NoteAgent or by changing the sound itself.

The Rule: anything that moves can be dragged and used.

the interface

■ helper agents: targetAgent



The TargetAgent creates a trace of spots that attract the active and focused noteAgents. By using Targets, the user can influence the whole melody temporarily.

When a large amount of targets is near a noteAgents Position, the noteAgent sets its motive position to the new position.

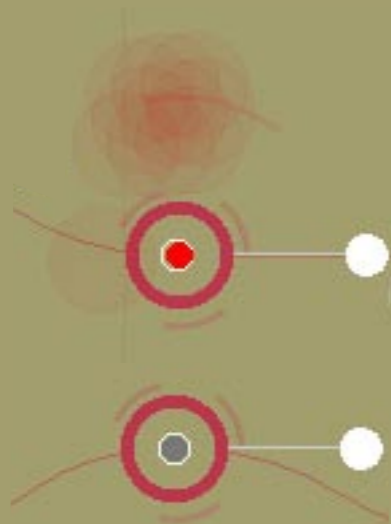
the interface

■ helper agents: switchAgents



With the **switchAgents**, the user can switch a group of **noteAgents** on and off. The user drags one **switchAgent** out of the **swarm** over a group of **noteAgents**.

If the first one is active, the **switchAgent** will deactivate all active **noteAgents** and vice versa.



the interface

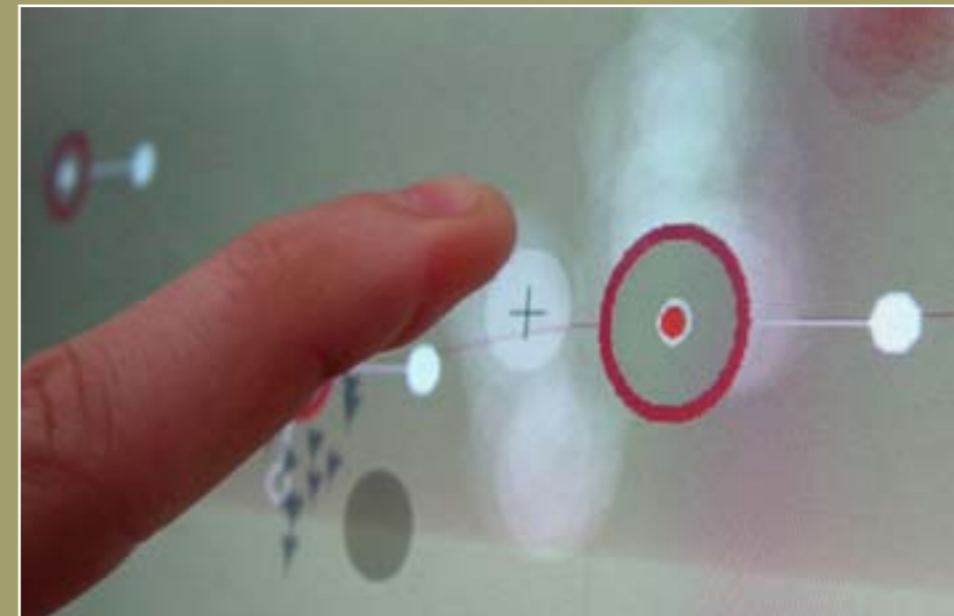
■ helper agents: velocityAgents



The white velocityAgent creates a cloud which increases the noteAgents Velocity.

The black velocityAgent creates a cloud which decreases the noteAgents Velocity

Velocity means how hard a MIDI note is played. On some instruments this has an effect on the volume, on others it changes the sound.

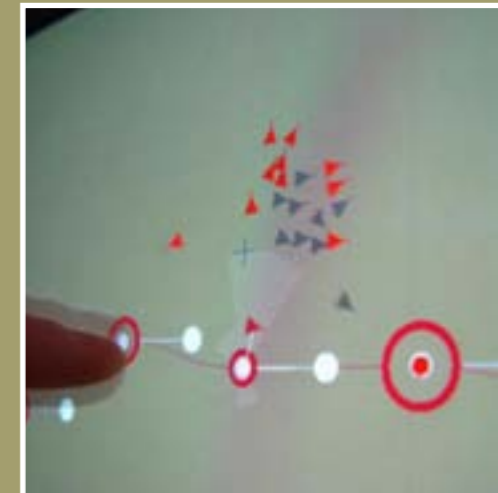
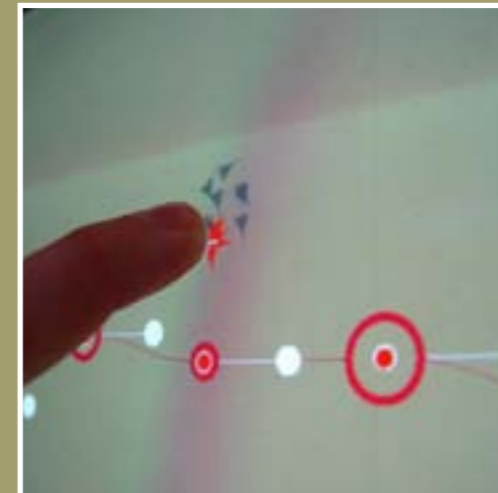
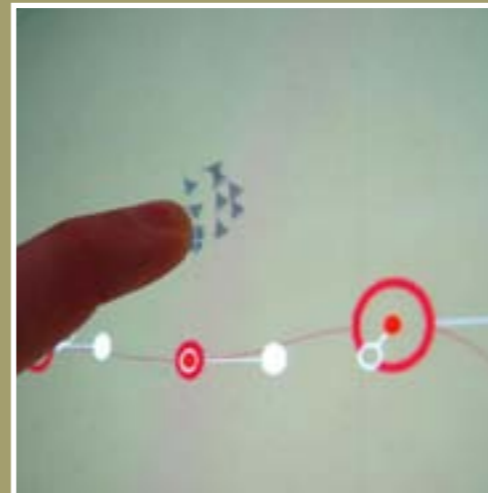


the interface

■ helper agents: controllerAgents

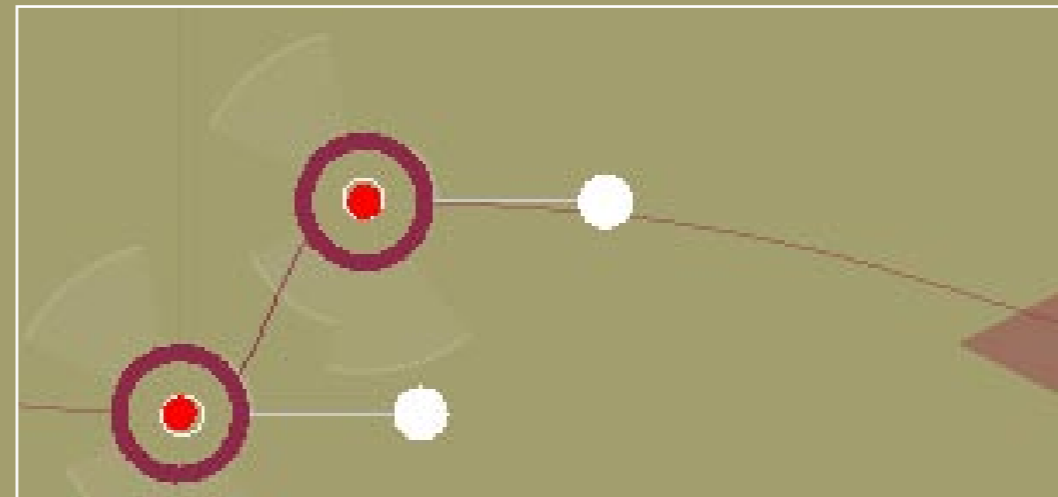
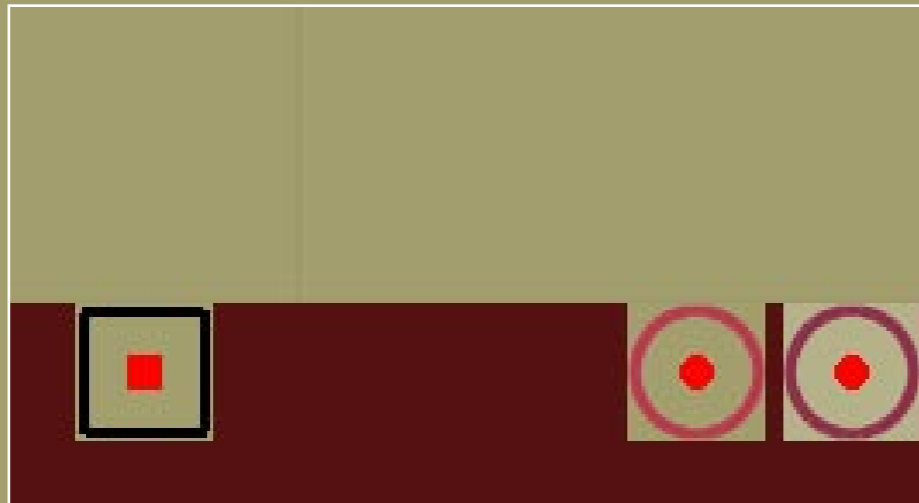


The controllerAgents are moving in a swarm until they are irritated by touching them. Then they become aggressive and start to change sound parameters of one nearby noteAgent. After that they return to the Swarm.



the interface

■ static control elements

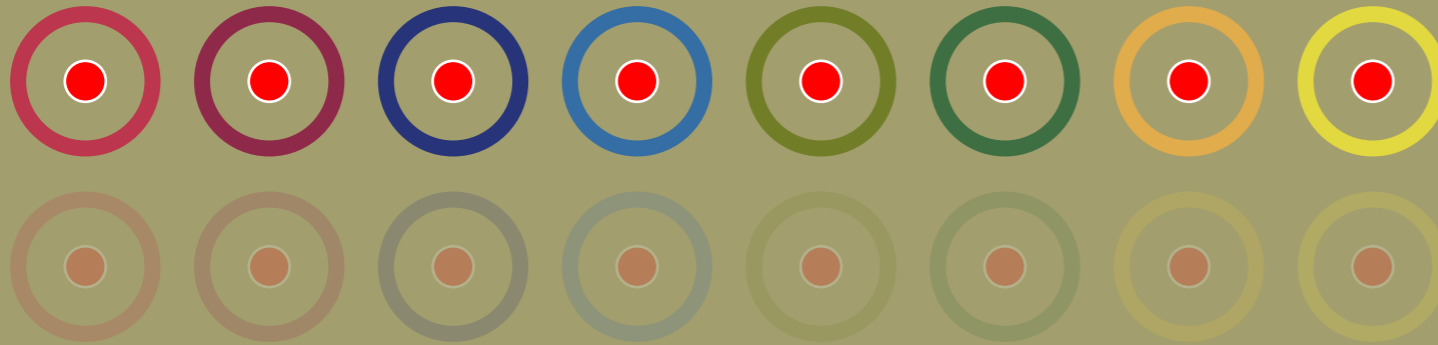


Additional controllers are the instrument controllers on the lower edge of the screen. By dragging over them the user can create new noteAgents or beatAgents and mute the beat or whole instrument group.

By dragging agents to the dark-red area, they are deleted.

The coloured triangle on the left side of the screen is used to change the vertical position (pitch) of the focused instrument group.

colours and shapes

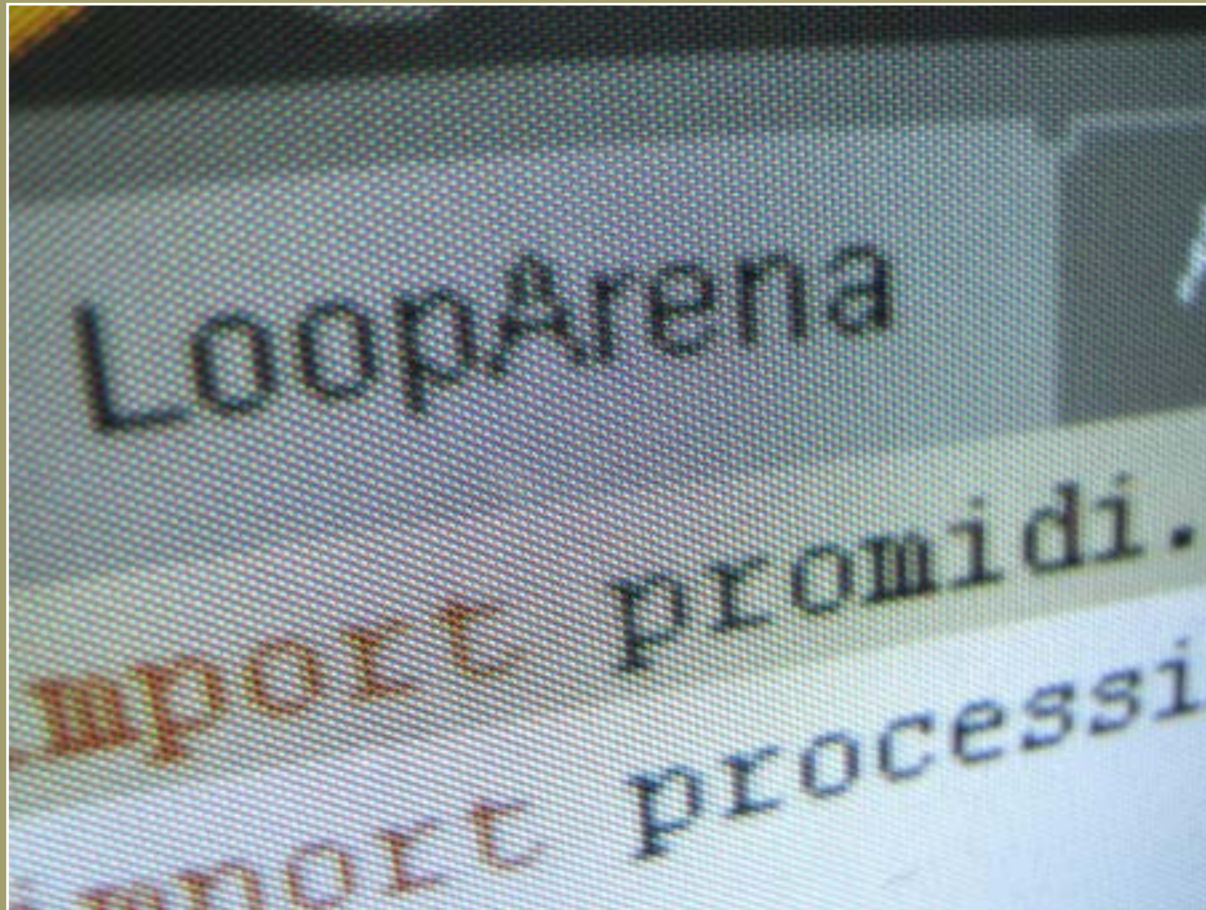


The eight Instruments are coloured for better recognition.
The unfocused instruments are transparent.

The excessive use of colours and special forms was avoided to keep the interface neutral-looking and suitable for different sounds and instruments.



technology



The interface was programmed in **Processing 0091** using the **proMidi Library** by **Christian Riekoff**.

The instrument groups send their notes to **channels 1-8** of the MIDI output port selected by the user on program start.

The drum signals are sent to **Channel 10**, according to **General MIDI Standards**.

Synchronisation with other sequencers and live equipment will be possible over **Midi input** in upcoming versions.

The touchscreen in use should be able to **emulate a mouse**, which means that touching means click, and touching and moving means drag.

(ELO Touch systems tested and recommended)