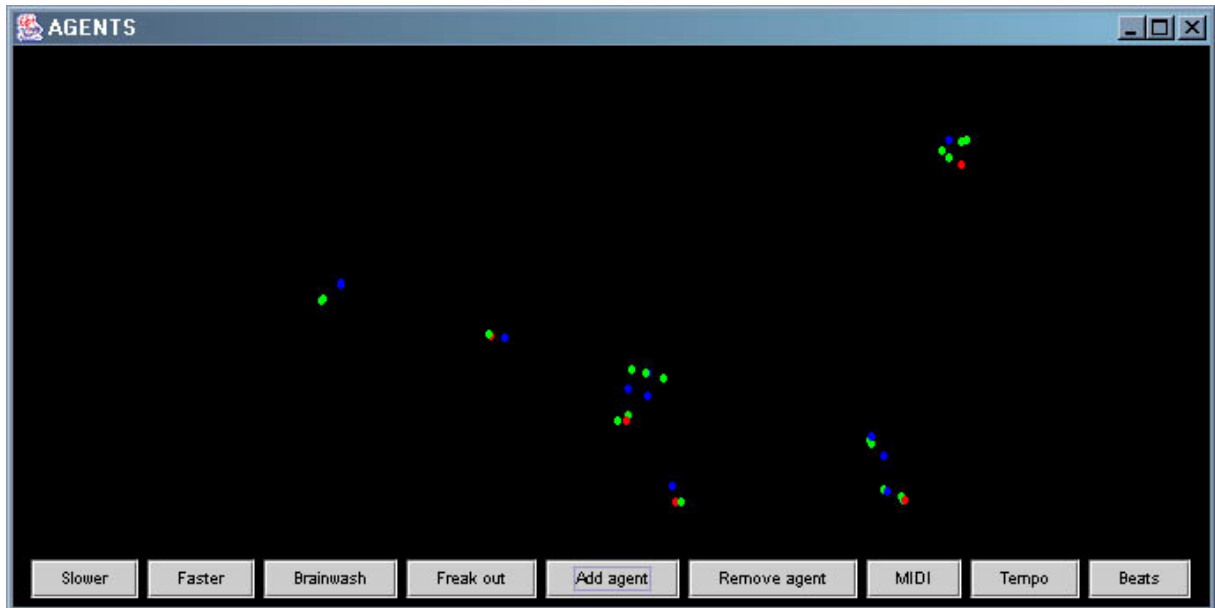


AGENTBEATS



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Introduction

AGENTBEATS is an "instrument" which generates MIDI-signals, not sounds.

The MIDI-signals are being created based on the "life" of software-agents acting in a virtual (empty) world. Interactions between the agents determine the resulting MIDI-signals. Each agent has a musical pattern associated with it. And each agent has its own behavioural pattern.

Sounds are handled in any software or hardware that supports the MIDI-protocol, either as MIDI files or via a physical MIDI-port.

Installation

Windows

To install AGENTBEATS on a windows machine the following steps are required:

1. Install JAVA 2 JRE or JDE from Sun (which can be downloaded for free at <http://java.sun.com/getjava/download.html>).
2. Add the PATH to java.exe on your system.
3. Create a new folder (called something like AGENTBEATS) on your computer.
4. Unzip AGENTBEATS.zip into the new folder.
5. Run msDrivers.exe and open port 1 for output to a MIDI device of your selection.
6. Run AGENTBEATS.bat

For further instructions regarding point 5 please read "using msDrivers.pdf" which is located in the AGENTBEATS.zip file.

Mac OSX

To be explained.

Other operating systems

AGENTBEATS should be able to run on any operating system that supports JAVA 2.

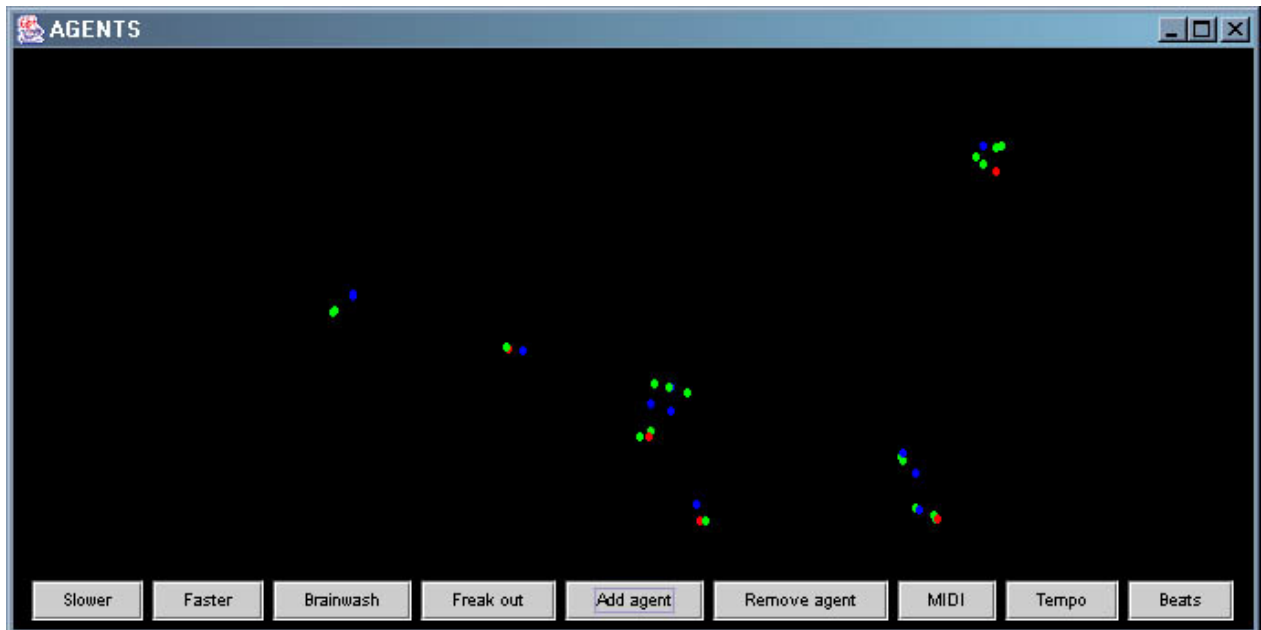
The only thing that changes from operating system to operating system is the native MIDIShare libraries and the Java Virtual Machine. Versions of MIDIShare have been developed for almost all operating systems.

To get AGENTBEATS running only requires that the MIDIShare libraries are present in the same folder as the Agentbeats.jar file or a common system folder.

MIDIShare libraries for several operating systems can be downloaded at this link:

<http://www.grame.fr/MidiShare/Install/InstallMenu.html>.

Agents



The agents screen shows the agents moving about in their empty universe.

When an agent becomes grey it means it is about to "die", after which its associated pattern will mutate, into a variation of itself. Each agent has a "lifetime" that can be set for each agent.

When it changes to green it is because it has an encounter with another beatagent, which also has an encounter with it (meaning that they are both "cool" with each other), this can result in a "breeding", where the musical pattern of that agent is moved in relation to the 1-beat of the bar, and the agent turns red. The probabilities of breeding and meeting and other behavioural parameters can be set for each agent.

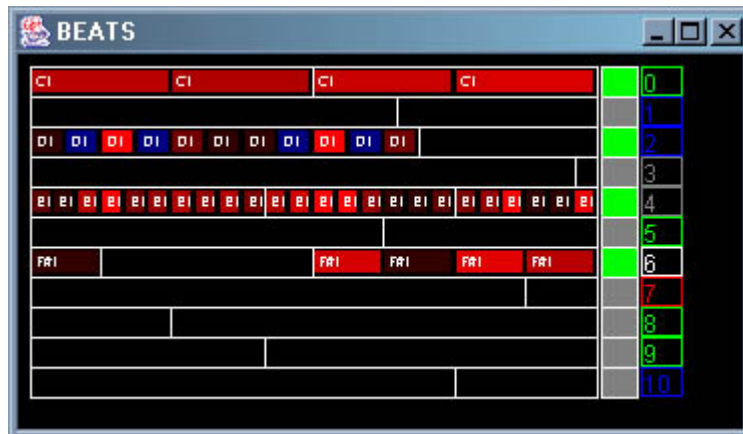
When an agent changes to yellow, it is because, it has made a "freak"-mutation, meaning that an entire full/no power hit has been inserted into the associated musical pattern at some position within its limits.

When clicking on an agent, that agent will be "brainwashed", the effect being that the agent will "forget" all relations to other agents. In effect this causes the agent to change behaviour and thereby also its associated musical pattern. All agents can be "brainwashed" by clicking the "brainwash" button.

Clicking the "Freak out" button will simply redistribute the agents randomly across the screen.

Clicking the "Beats" button will make the beats screen appear, this will be explained in the next section.

Beats



The beats screen displays the musical patterns associated to all existing agents, as they are normally perceived in a standard rhythm box or sequencer, except the fact that the "grid" is not fixed. This means that it is possible to have a pattern of 1/17 notes and play it along with one of 1/18 notes.

Each square in the rhythm-grid represents a "hit" or a "note-on event".

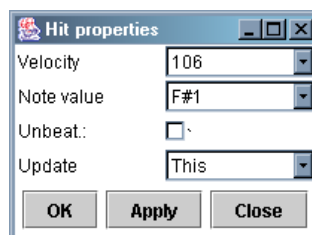
When a hit is blue it means that the position is protected; it is an "unbeat" (whereas it will always be mute).

When it has some red colour it is active, meaning it will generate a "note on" in a midi file/stream. A brighter red means higher volume/velocity.

Each hit has a note-value associated with it, which is displayed on the hit.

Right clicking on a hit will mute/unmute that hit.

Double-clicking on a hit brings up the hit-properties



In the hit-properties it is possible to change the following parameters:

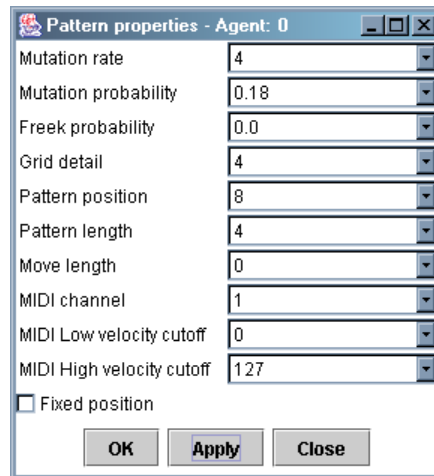
- Velocity – The volume/velocity of the hit.
- Note value – The note value of the hit.
- Unbeat – Turns the hit mute or unmute.

In the hit properties it is possible to update several hits in a pattern at the same time, by changing the selection in the Update field. Possible values are: this, all, even & odd.

When clicking Apply the changes (if any) will take effect. Clicking Close will close the hit-properties window, without updating any agents. Clicking OK is the same as clicking Apply and then Close. This is valid in other properties screens also.

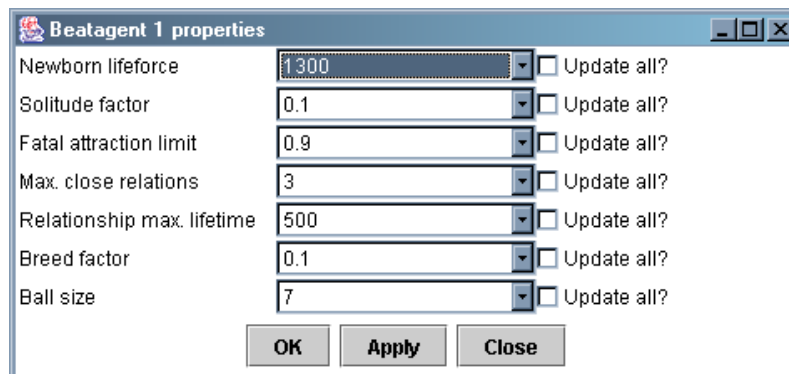
Right clicking on the grey/green square next to the pattern will mute/unmute the pattern. Green means unmute, grey means mute.

Double-clicking on the grey/green square next to the pattern will bring up the pattern properties.



Right clicking on the number associated with a pattern will “highlight” that agent in the life screen whereas it will turn white and its size will increase a bit, so that it can be localised among the other agents.

Double-clicking on the number associated with a pattern will bring up the agent properties.



Behaviour

A note about the relation between the behaviour of the agents and the effect they have on the rhythmical patterns is in place.

The relation is very precisely defined in terms of simple rules (they are further explained in previous sections), but the combination of the number of agents, the rules of behaviour and the random elements introduced (the different probabilities related to the rules f.ex.) result in a very complex mapping that even the author of the program does not completely understand.

The social behaviour of the agents is itself interesting to study, and the effect of changing the behavioural parameters can sometimes result in funny “societies”.

Some examples: to stop the patterns from moving (in relation to the 1-beat of the bar), set the solitude factor for all agents to 1.0, then they won't interact and all patterns stay fixed at the current position. This is a somewhat “paranoid” society.

To get the patterns moving again, decrease the solitude factor and increase the breed probability. A more sociable society is the result.

To stop the patterns from mutating, set the mutation probability to 0.0 or decrease the mutation rate. Another way of changing the tempo of the mutations is to change the newborn life force parameter; higher values will make the agent mutate slower and vice versa.

The parameter fatal attraction limit is a very strong one, as it determines whether an agent should follow another agent. What it says is that if an agent is attracted more than the fatal attraction limit towards another agent then it will follow that agent. All agents have attractions defined towards other agents, in terms of percentages. Setting the fatal attraction limit very low will basically make all agents follow each other, and thus creating a big chunk of agents.

Agents always follow another agent if they have a "close relationship". A close relationship is another thing than an attraction, but is, however, dependent on the attractions between the agents.

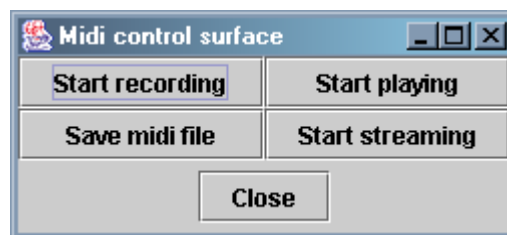
It is among one of the highest priorities of coming versions to enable the user to manipulate the rules of interaction in a higher degree.

MIDI

The program is able to stream live midi-signals to other sound generating tools, by using an interface called MIDISHARE. It is contained in the download package. Get more information on MIDISHARE at this link: <http://www.grame.fr/MidiShare/>.

The program is able to record a session into a midi file for later use in a sequencer or something.

MIDI functions are handled by accessing the MIDI control surface by clicking the MIDI button.



Pushing the Start recording button will activate recording, and the button will change text to Stop recording.

Each time a new recording is initialised the previous is erased.

Pushing the Save midi file button will save the last recording into a file.

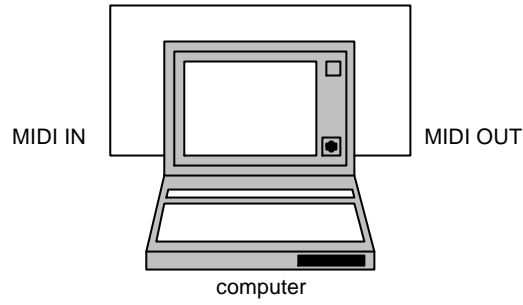
The Start Playing button currently has no function.

The Start streaming button will make AGENTBEATS start sending MIDI signals to the MIDIShare library, and thus to the ports and interfaces that have been configured therein to receive events.

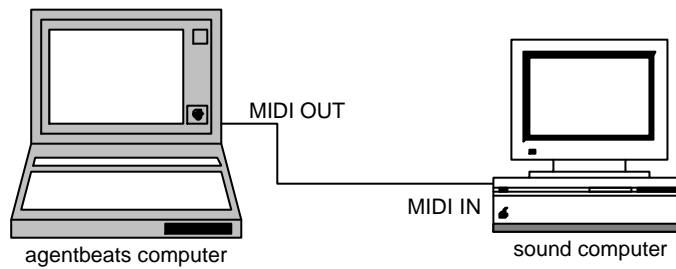
Clicking the Tempo button in the main screen can control the tempo of the MIDI stream.

Appendix A – Hardware scenarios

SETUP - ONE COMPUTER
USING AGENTBEATS AND A
SOFTWARE SYNTH/RHYTHM BOX



SETUP - TWO COMPUTERS
USING AGENTBEATS AND A
SOFTWARE SYNTH/RHYTHM BOX



SETUP - ONE COMPUTER
USING AGENTBEATS AND A
HARDWARE SYNTH/RHYTHM BOX

