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Installation: **Attractor Generated Melodies**

Abstract:
Presently there are many approaches to visualize audio streams, but only few use visual data to govern audio synthesis or generate music sequences. The motivation of this work is to explore novel ways to generate audio out of dynamic physical systems. In this particular case a three dimensional attractor [1] equation was used to generate an evolving melody.
The project was programmed in java within the "processing" environment. Standard "processing" libraries were used for the visual output. The audio was generated with the "minim" audio.

The engine for generating the music sequence is a slightly modified Peter de Jong [2] attractor:

xn = sin(a*y) - cos(b*x)
yn = sin(c*x) - cos(d*y)
zn = sin(e*z) - cos(f*x)

Eq.1: x,y,z are the coordinates of each point where the index n denominates the actual position and n-1 the previous position of the point. a,b,c,d,e,f are the parameters of the equations and define the shape of the attractor.

A defined amount of graphic points is randomly distributed in a three dimensional space and plotted on the screen (fig. 1). The position of each point is iteratively recalculated using the attractor equation (eq. 1). As expected from an attractor the points converge into a geometrical shape defined by the parameters of the attractor. During the iteration a sequence of 64 steps is filled with pitch values according to the coordinates of the points. The pitches are matched to the A-minor scale and played after the iteration. After a defined number of iterations the system is reset. Additionally the parameters of the attractor can be randomly generated. The points will then converge into another shape which will then generate a different melody.
In future versions the modulation of velocity, panorama and rhythmic will be integrated.

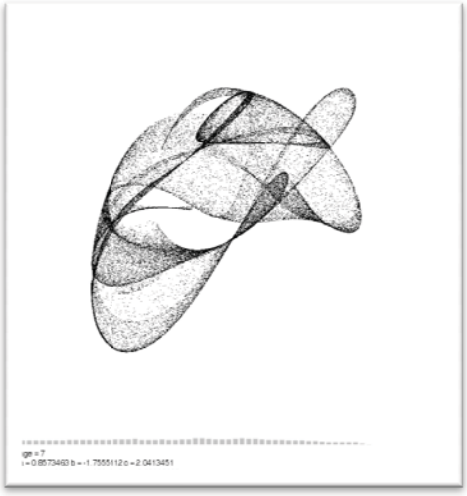

Fig. 1.: Screen shot of the interface.

Topic: Generative Composition

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References:
[1] http://en.wikipedia.org/wiki/Attractor
[2] http://local.wasp.uwa.edu.au/~pbourke/fractals/peterdejong/

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Keywords:
Dynamic System, Attractor, Peter de Jong, Melody, Compossition