THE ART OF NATHAN SELIKOFF
Aesthetic Explorations of Algorithmic Space
www.nathanselikoff.com
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A SOCIETY OF STICKPEOPLE
REAL-TIME INTERACTIVE SOFTWARE DEMO
A SOCIETY OF STICKPEOPLE
REAL-TIME INTERACTIVE SOFTWARE DEMO
BACKGROUND

Logistic map & Mandelbrot set
BACKGROUND

Logistic map & Mandlebrot set

Friday, May 22, 2009
BACKGROUND
Logistic map & Mandlebrot set

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BACKGROUND

Pendula

\[ y(t) = x_1(t): \text{angular position [rad]} \]
\[ x_2(t): \text{angular velocity [rad/s]} \]
BACKGROUND

Pendula
BACKGROUND

Pendula
BACKGROUND

Pendula
BACKGROUND
Lorenz
\[ \frac{dx}{dt} = \sigma(y - x) \]
\[ \frac{dy}{dt} = x(\rho - z) - y \]
\[ \frac{dz}{dt} = xy - \beta z \]
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\frac{dy}{dt} = x(\rho - z) - y \\
\frac{dz}{dt} = xy - \beta z
\]
\[
\begin{align*}
\frac{dx}{dt} &= \sigma(y - x) \\
\frac{dy}{dt} &= x(\rho - z) - y \\
\frac{dz}{dt} &= xy - \beta z
\end{align*}
\]
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\frac{dx}{dt} = \sigma(y - x) \\
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\frac{dz}{dt} = xy - \beta z
\]

\[
\begin{align*}
  x_n &= x + a*d*(y-x) \\
  y_n &= y + d*(b*x - y - z*x) \\
  z_n &= z + d*(x*y - c*z)
\end{align*}
\]
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\begin{align*}
\frac{dx}{dt} &= \sigma(y - x) \\
\frac{dy}{dt} &= x(\rho - z) - y \\
\frac{dz}{dt} &= xy - \beta z
\end{align*}
\]

\[\begin{align*}
\text{xn} &= x + a*d*(y-x); \\
\text{yn} &= y + d*(b*x - y - z*x); \\
\text{zn} &= z + d*(x*y - c*z);
\end{align*}\]
ÆXPLORATION
Real-time Interactive Software Demo
EXPLORING & CHARACTERIZING THE SYSTEM

Lyapunov Exponent, Faces of Chaos

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DIGITAL CHRONOPHOTOGRAPHY
A Society of Stickpeople

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EXPLORING FORM
Volumetric Rendering Techniques
FILLING SPACE & QUESTIONING RELATIONSHIPS
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FILLING SPACE & QUESTIONING RELATIONSHIPS
Original Equations

- \( x' = (\sin(y*b)+c*\sin(x*b)) \)
- \( y' = (\sin(x*a)+d*\sin(y*a)) \)
GOING BACKWARDS

- Original Equations
  - \( x' = (\sin(y*b)+c*\sin(x*b)) \)
  - \( y' = (\sin(x*a)+d*\sin(y*a)) \)

- One Recursion
  - \( x' = \sin((\sin(x*a)+d*\sin(y*a))*b)+c*\sin((\sin(y*b)+c*\sin(x*b))*b) \)
  - \( y' = \sin((\sin(y*b)+c*\sin(x*b))*a)+d*\sin((\sin(x*a)+d*\sin(y*a))*a) \)
GOING BACKWARDS

- Original Equations
  - $x' = (\sin(yb) + c\sin(xb))$
  - $y' = (\sin(xa) + d\sin(ya))$

- One Recursion
  - $x' = \sin((\sin(xa) + d\sin(ya))b) + c\sin((\sin(yb) + c\sin(xb))b)$
  - $y' = \sin((\sin(yb) + c\sin(xb))a) + d\sin((\sin(xa) + d\sin(ya))a)$

- Two Recursions
  - $x' = \sin((\sin((\sin(yb) + c\sin(xb))a) + d\sin((\sin(xa) + d\sin(ya))a))b)$
    $+ c\sin((\sin((\sin(xa) + d\sin(ya))b) + c\sin((\sin(yb) + c\sin(xb))b))b)$
  - $y' = \sin((\sin((\sin(xa) + d\sin(ya))b) + c\sin((\sin(yb) + c\sin(xb))b))a)$
    $+ d\sin((\sin((\sin(yb) + c\sin(xb))a) + d\sin((\sin(xa) + d\sin(ya))a))a)$
SOURCES

- http://www.nathanselikoff.com
- http://bugman123.com/Fractals/Fractals.html
- http://www.magnetnerd.com/Neodymium%20Magnets/art.htm
- http://math-art.net/2007/12/02/lorenz-attractor-a-3d-render/