Personal Inquiry – Annotated list of references

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Presentation Method: Poster

Poster Section 1: What is Chaos?

In this section I am introducing the topic. I am describing different types of chaos and how individual perception affects our sense for chaos or chaotic systems. I am also going to define the terminology. I support my ideas with a lot of examples, like chaos in our daily life, then I am going to do a transition to simple mathematical chaotic systems.

Larry Bradley. (2010). *Chaos and Fractals*. Available: www.stsci.edu/~lbradley/seminar/. Last accessed 13 May 2010.
This website delivered me with a very good introduction into the topic as there are a lot of books and interesting web-pages in the “References”-Sektion.

Gleick, James. *Chaos: Making a New Science*. Penguin Books, 1987.
The book gave me a very general introduction into the topic.

Harald Lesch. (2003-2007). *alpha-Centauri* . Available: www.br-online.de/br-alpha/alpha-centauri/alpha-centauri-harald-lesch-videothek-ID1207836664586.xml. Last accessed 13. May 2010.
A web-page with German video-documentations delivered a lot of vivid examples about chaos for my poster.

Poster Section 2: Laplace's Demon and the Butterfly Effect

In this part I describe the idea of the so called Laplace's Demon and the theory of cause-and-effect chains. I work with a lot of examples, especially the famous weather forecast example. Also too I introduce the mathematical concept of a dynamic system.

Jeremy S. Heyl (August 11, 2008). *The Double Pendulum Fractal*. British Columbia, Canada.
A paper explaining different aspects of the double pendulum.

Boston University. (2010). *The Dynamical Systems and Technology Project at Boston University*. Available: http://math.bu.edu/DYSYS/dysys.html. Last accessed 13. May 2010.
A very good web-page with detailed explanations about dynamic systems.

Wolfram Research. (2010). *Dynamic Systems*. Available: http://mathworld.wolfram.com/LorenzAttractor.html. Last accessed 13. May 2010.
Very mathematical presentation of dynamic systems.

Jürgen Giesen (30.1.1995). *"Chaosforschung": Fraktale - Chaos - Ordnung*. Germany
A German paper about the study of chaos supported me with a lot of practical examples.

René Müller . (2009). *Magnetic Pendulum Fractal Simulation On Parallel Computers*. Available: www.inf.ethz.ch/personal/muellren/pendulum/. Last accessed 13. May 2010.
A very good online-resource for pedulum simulations.

Poster Section 3: Fractals

In this block I am introducing shortly the mathematical principal of attractors. I also present the chaotic behaviour of logistic equations. Subsequent I will reveal the connection to fractals, especially Julia Set and Mandelbrot Set. Additionally I will present a short overview about different types of fractals like Sierpenski Triangle, Koch Snowflake, Lindenmayer Systems and Lyapunov Fractals.
In general I tried to work with a lot of images and visualisations in order to support my ideas. As I am presenting with a poster I will not go too much into the mathematical details when it's not necessary for the overall understanding.

Dietmar Grätzer (2002). *Fraktale und Chaos*. Germany
A German paper which delivers a very detailed mathematical background.

Yin-Wei Chang, Fay Huang (.). *Fractal Art based on "The Butterfly Effect" of Chaos Theory*. Taiwan: National Ilan University.
A paper focused on fractal generation based on the chaos Theory, it helped me with the understanding of the "Butterfly Effect". It is also very good resource of how to create fractals from an artistic point of view.

Glenn Elert. (2010). *The Chaos hypertextbook*. Available: http://hypertextbook.com/chaos/. Last accessed 13. May 2010.
The webpage supported me with a lot of information about the certain Fractal structures like Juliaset, Mandelbrotset and Lyapunov.

Poster Section 4: Usage of chaotic structures in CG

In the final Passage I am going to show the benefit of chaotic structures in the modern Computer Graphic. I am mainly going to present Random-Functions and different types of Noise-Patterns and Cloud Algorithms.

Scott Draves, Erik Reckase (2003). *The Fractal Flame Algorithm*. USA.
The paper to create fractal-based smoke and fire patterns.

Paul Bourke. (2000). *Perlin Noise and Turbulence*. Available: http://local.wasp.uwa.edu.au/~pbourke/texture_colour/perlin/. Last accessed 12. May 2010.
A very good and illustrative explanation of the "Perlin Noise"-algorithm.

Poster Section 5: Buddhabrot-Fractal and Quantum Chaos

In the last section of my poster I present a more philosophical approach in the context of the chaos theory. I briefly introduce the concept of Quantum Chaos and I also show the amazing Buddhabrot-Fractal.

Paul Nylander. (2010). *Hypercomplex Fractals*. Available: www.bugman123.com/Hypercomplex/. Last accessed 12. May 2010.
A very good resource for hypercomplex fractals with a lot of images.

Ze'ev Rudnick (2004). *What is... Quantum Chaos?*
A very good paper with a lot of information about Quantum Chaos.

Melinda Green. (2010). *The Buddhabrot Technique*. Available: www.superliminal.com/fractals/bbrot/bbrot.htm. Last accessed 13. May 2010.