About

Lexikon-Sonate is a work-in-progress which was started in 1992. Instead of being a composition in which the structure is fixed by notation, it manifests itself as a computer program that composes the piece - or, more precisely: an excerpt of a virtually endless piano piece - in real time. *Lexikon-Sonate* lacks two characteristics of a traditional piano piece:

there is no pre-composed text to be interpreted, and
there is no need for a pianist or an interpreter.
Instead, the instructions for playing the piano - the indication "which key should be pressed how quickly and held down for how long" - are directly generated by a computer program and transmitted immediately to a player piano (or the built-in Quicktime synthesizer) which executes them.

Navigation map of the electronic Lexikon-Roman
© 1992-98 by Libraries of the Mind

The title *Lexikon-Sonate* refers to the "Lexikon-Roman", written in 1968-70 by the Austrian-Slovakian author Andreas Okopenko. This novel appears to be one of the very first literary HyperTexts, independently of Ted Nelson who introduced this term about the same time. This novel - *"a sentimental journey to a meeting of exporters in Druden"* (subtitle) - consists of several hundred small chapters which were brought into alphabetical order. By reference arrows as in a lexicon the reader could make her own investigations through the multiple nested web structure of the text. Instead of presenting a sequential text with a predefined direction of reading, Okopenko provides a structure of possibilities, which challenges the reader to become a creator of her own version of this novel. Originally, *Lexikon-Sonate* was conceived as a musical commentary to an electronic implementation of Okopenko's "Lexikon-Roman", carried out by the interdisciplinary group "Libraries of the Mind". But soon afterwards it started its own life due to its manifold ramifications, becoming an outstanding example in the domain of algorithmic composition.

Lexikon-Sonate consists of a variety of music-generation modules (so-called structure generators) which are related in a very complex way as a musical HyperText. Each module generates a specific characteristic musical output as a result of the compositional strategy that has been applied. A module represents an abstract model of a specific musical behaviour. It does not contain any pre-organized musical material, but a formal description of it and the methods how it is being processed.

These modules are structural re-implementations of piano gestures obtained by analysis of piano music from Johann Sebastian Bach, Mozart, Schönberg, Webern, Boulez, Stockhausen and Cecil Taylor. They will never appear as verbal quotation (because none of this gestures has been "sampled"), but mainly as "allusion". Furthermore, they are open and generic enough so that different modules playing at the same time can intermingle, creating unpredictable meta-structures.

The idea of autopoiesis - material organizing itself due to certain constraints - plays an important rule. By using a lot of different random generators which are controlling each other (which - according to serial thinking - form a scale between a completely deterministic and a completely chaotic behaviour), always new variants of the same model are generated. Variants that may differ dramatically from each other, though they are always perceptable as "inheritances" of the given structural model. Seen in this light, *Lexikon-Sonate* can be perceived rather as a meta-composition which enables the unfolding of piano music than a fixed work.

The underlying program was written in MaxMSP (© 1990-2012 IRCAM / Cycling '74), an interactive graphical programming environment for multimedia, music, and MIDI, running on a Macintosh computer. Having worked with computers for many years - designing my own xLOGO-based software environment for Computer Aided Composition - I felt the challenge to write an interactive computer program which is able to compose in Real Time. For this purpose I took advantage of my **Real Time Composition Library** (RTC-lib), a collection of MAX-objects designed for musical composition which includes a variety of musical functions, compositional techniques, and algorithmic strategies.