Camera Musica
Virtual Architecture as Medium for the Exploration of Music
Gerhard Eckel
The Banff Centre for the Arts, Banff, Alberta, Canada
eckel@banffcentre.ab.ca

Abstract
Interactive music installations allow listeners to directly experience the openness of a composition because they may affect its unfolding, a privilege which has been reserved only to composers and instrumentalists in the past. In the music installation Camera Musica, the notion of a remotely controllable (virtual) camera is used as a vehicle to explore an audio-visual space. The vocabulary of architectural organization of space is used to enrich the audience through the music.

1 Introduction
The articulation of architectural and musical space, as is put forward in this project, is motivated by a compositional approach centered around the idea of open form. In this context, composition is not any longer understood as an activity yielding a musical text, which needs to be interpreted by musicians in order to become perceivable by the audience. Music is not any longer conceived in form of finite units (i.e. (recordable) pieces) but in terms of models (1) capable of producing a potentially infinite number of variants of a particular family of musical ideas. Such models or meta-compositions represent a new type of musical artefact which redefines the way music may be conceived and perceived. Performing such music is closer to exploring an object or space than to interpreting a text. The problem of open form, which has a long tradition in twentieth century music, is reformulated through this conception of composition inspired by the possibilities offered by new media technology. By using navigable visual representations of architecturally organised space, the audience is enabled to interactively explore an open composition, sensible connotations between the visible and audible space guide the exploration and suggest directions to be taken.

2 Points of departure
The approach taken in the Camera Musica project (2) developed out of previous attempts to explore alternative forms of music composition and presentation.

2.1 Dispersion
Most relevant in this respect is any composition Dispersion (3) which defines a mechanism of sound fragmentation or decomposition applicable to any set of structured sound sources. For the premiere of Dispersion in the context of the 1989 Cage Project at the Vienna Konzerthaus, a percussion version of John Cage’s Variations II realised and performed by Elisabeth Flunger was used as source material. The concert was given in the big hall of the Vienna Konzerthaus and consisted in a simultaneous performance of a special version of Cage’s Piano Concerto, his Variations II (transformed by Dispersion) and the reading of two of his lectures. The set-up in the hall was unusual as well insofar as all seats were removed and the musicians were spread over the immense space such that the audience could freely walk around during the performance. This set-up is directly related to the idea of Dispersion to propose alternative perspectives on already structured sound events through a technologically mediated process of spatial and temporal decompositions. The main intention of Dispersion was to make the openness of the music directly recognisable for the audience by offering a multiplicity of auditive perspectives. The installation-like performance situation underlined this intention, which is also central to Camera Musica.

2.2 en face
Another important stimulus for the Camera Musica concept can be seen in the music installation en face (4) which I realised for the 1993 Mediate Festival in Hamburg (with the support of the Zentrum für Kunst und Medientechnologie Karlsruhe). Inspired by the experience with Dispersion, I wanted to explore the installation situation for its potential as an alternative to the temporal and spatial constraint of presenting music in concert halls. It seemed to me that aesthetic concepts such as indeterminacy, openness, and ambiguity would more likely find their adequate expression in the informal context of an installation. This aspect also matched my intention to shift the attention in composing from the construction of final processes towards a disposition of possible situations. In en face, I worked for the first time with what I called above a meta-composition: Composing en face consisted in devising a set of related musical states which define a kind of musical space. This implied a choice of the proper sound material for each state and to
invent a set rules or mechanisms that describe the structural arrangement and articulation of this material. Each part has a static aspect which makes it incomensurable and a dynamic aspect allowing for a connection with other states. The states were defined in an open manner such that they could be realized in many different ways without losing their identity. The actual realization (i.e. the applications of the rules that describe it and the creation of the sounds which makes it perceivable) is carried out by a program running in real-time during the presentation of the installation. Thus, the composed musical space becomes perceivable through an ongoing exploration process controlled by this program, which continuously proposes new perspectives while never repeating itself. This type of openness, which is one of the central aspects of the Camera Musica project, can also be found in the work of Karlheinz Essl (e.g. Lextion-Sonat) [5] and some of the formal aspects of en face were actually inspired by my collaboration with Karlheinz at IRCAM in 1992.

3 The new musical artefact

I regard the programs implementing en face or the Lextion-Sonat as instances of a new type of musical artefact. By musical artefact I understand the concrete outcome of the compositional process, the kind of representation chosen by the composer to compose and communicate the music. The nature of the musical artefact defines the relationship between composers, musicians, and the audience. The traditional musical artefact is the score (i.e. a text) or the tape in the case of electronic music. Typical for the old musical artefact is that it represents music linearly in time, i.e. that the representation of music is organised along a time line. By new musical artefact I understand a representation of music which describes music in terms of a model, in terms of a mechanism capable of generating the music (the meta-composition). Thus, the fundamental difference between old and new artefact is the absence of a linear text, implying the absence of the traditional interpretation process. Although history has seen precursors of the new artefact (e.g. in form of recipes to generate scores), its conception became only imaginable with the means of new technology. This is mainly due to the problems of presenting music represented by a composed machine or composing machine. The object-like nature of the new musical artefact invites to perform this music in interactive installations similar to sound installations, sound sculptures, or cybernetic sound models. But the experience with these forms has shown, that the interaction models, which are usually based on simple triggering or tracking concepts, are not refined enough to explore a composed music space. It turns out that one of the central problems of interactive music installations lies in the interaction model the installation proposes to the audience. In contrast to en face, Camera Musica will react to actions of the audience, which consists in exploring a virtual space (the music chamber) by navigating a virtual camera (the music camera) through this visual space, which is connected to the music space audible at the same time.

4 Interaction model

The interaction model for a music installation has to fulfill two requirements: it has to be intuitive (i.e. adapted to the competence of the audience) and it has to propose a refined metaphor for navigation (i.e. it must allow for an exploration of complex spaces). Camera Musica uses visual space as a vealid for the exploration of music. By the means of a projection-based virtual reality system users will explore this space with the same ease and intuition as they would walk through a city or a building. The different objects they will encounter in this space and the various situations they may experience are set into relation with the structure of the music produced while wandering upon. This Camera Musica uses virtual reality technology not mainly for its immersive capacities but as an intuitive interface to explore complex and ambiguous musical relationships.

5 Architecture

In order to make the visual space explorable it has to be carefully designed and organised. Only referring to every-day experience anybody can assumed to be acquainted with the necessary ease and subtlety of navigation. The exploration of Camera Musica is based on our capacity to decode architectural signs, which help us to orient ourselves in the urban environment and allow us to decipher the meaning conveyed by architectural structures. This is why the problem of the architectural organisation of space became a key element of the project: Understanding architecture as a "system of sign vehicles that promote certain kinds of behaviour" [6] makes it a powerful medium to guide the audience through a virtual space, through virtual architecture. Although the conditions under which virtual architecture (which, in this context, is not understood as a model for real architecture) is conceivable and perceivable are quite different from real architecture, it is still possible to use the language of architectural to make the visual space readable. The modalities of exploring virtual architecture are reduced to vision and movement (change of perspective). Almost all constraints relevant to architectural problem solving are absent in virtual architecture. There is no program or function in the traditional sense other than creating curiosity (i.e. appearing worth to be explored). There are no constraints due to gravity or the physical properties of the material being used.
Only as far as the design language makes reference to these particularities of real architecture, these constraints play a role in virtual architecture. This opens up an interesting potential of playing with the ambiguities between these language elements and their eventually slightly distorted counterparts in virtual space (e.g. a wall built from free floating bricks). But the main role of virtual architecture in Camera Musica is to propose a carefully designed and organized space offering subtle connections to the structure of the music to be explored.

6 Music

The music of Camera Musica is conceived in a way similar to en face: it is also the notion of state which serves as reference framework. As in en face, a whole family of musical states defines the musical space proposed by the installation. The main difference is that this space is not explored automatically but can be explored actively by the audience. When exploring Camera Musica, the audience will be able to move from one state to the next one by which means the imaginary musical space will reveal itself. Each state is linked to a specific location in the architectural space and the visually pertinent characteristics (e.g. shape, texture, colour, perspective, distance) are connected to aspects of the musical structure. By moving through the visual space, the musical space becomes explorable. The architectural signs structuring the visual space serve as vehicle to hint relationships between musical states and thus render the topology of the musical space perceivable. The various relationships between the different states, which are based on affinities or contrasts on the level of the structure and the sound material used, become audible through the movement introduced by the audience. Besides its static properties, each state also has a dynamic comportment, which allows for its local inspection (in case one remains in a state, i.e. at a spot) and defines articulation points for transitions between states.

7 Realisation

Camera Musica is a project in progress. The original idea dates back to fall 1993 when I proposed a contribution for the German contemporary music journal Positions [2]. First sketches have been realised during my three-month period as composer in residence at the Banff Centre for the Arts in fall 1995. Since then I have been working mainly on the conception of the visual and the installation, which involved an intensive and very fruitful confrontation with problems of architectural design [7]. A study of architectural sculpture helped to clarify the notion of the architectural sign and its possible roles in contexts other than architecture. On the technological side, the proper simulation of shadows and especially indirect light effects turned out to be of crucial importance for a realisation of the project ("The elements of architecture are light, shadow, the wall and space" [PI]. Unfortunately, this necessity calls for specialised modelling software and high-performance virtual reality equipment rarely accessible to artists. Another still unsolved problem is the design of the actual navigation interface, i.e. the device to drive the Camera Musica. Suggestions are very welcome.

8 Conclusion

As far as space constraints and the state of the project allowed it, I gave a necessarily fragmentary survey on the Camera Musica project, which tries to explore an area of articulation between music and visual art, in occurrence architecture, made accessible to artists through new media technology. Extensive experimentation in this area and the development of systems allowing for an integrated simulation of image and sound will still have to be completed until the new musical artefact will really become explorable by a broader audience. Media technology for artistic applications will have to develop from its current state of a multi- or hypermedia technology, a paradigm allowing for the necessary seamless integration of visual and audible media. By such a polyphony of media I understand the highest form of integration of media which allows to establish any kind of relationship between different media elements without compromises, work-arounds or arbitrary technological limitations. A nice utopia for a new century.

References