The computer as extension of the composer:

KARLHEINZ ESSL "more or less"

Miriam Akkermann

Department of Musicology, Berlin University of the Arts, Germany
akkermann [at] gmail.com
http://www.miriam-akkermann.de

Abstract. "more or less" was developed by Karlheinz Essl between 1999 and 2007. It is subtitled "real-time composition for computer-controlled soloists" and is designed for five performing musicians. Basis of the composition is an application which generates the score individually for each musician in real-time. This paper outlines an analysis approach to "more or less", providing a basis for discussion about the position of the computer as composer's extension in the compositional process.

Introduction

Computers can have very different positions within the compositional process. Concepts such as computer aided composition or algorithmic composition hand compositional decisions to the computer by implementing decision-guiding rules which are processed by the computer. The rules can range from precise behavior guidelines to chance operations and may produce a score or a (specific) sound.

In 1999, Karlheinz Essl[1] started to develop the composition "more or less" which is based on a score-generating application. The computer generates the score in real-time. The composition is designed for five musicians, each playing in front of a computer which runs the application and shows the generated score. Essl does not specify the instrumentation. While playing, the musicians can "request" new scores from the application. These characteristics pose new challenges for analysis. A traditional score-focused analysis, for example, is hardly possible, as the generated score constantly changes. The interpretation of the score is, depending on the interpreter, very close to improvisation. When analyzing a performance, it is very difficult to reconstruct the specific score from which each musician was interpreting at any given time.

This paper provides a starting point for analyzing real-time compositions in outlining one possible position of the computer as a composer's extension. As an analytical approach to "more or less", I present a description of the score-generation application, of the structure of the score and of the possible interpretations, as well as a short comparison to its predecessor "Champ d'Action". Furthermore, I will open the discussion about the position of the computer in the compositional process.

The application "more or less"

The application used in "more or less" is written in MaxMSP, using a RTC-library[2] programmed by Essl. It enables the compositional idea of providing a score which is interpreted in real-time by the five soloist musicians. The concept of "Five" plays an important role throughout composition: there are five musicians, five structures, and five letters constructing the gestures' titles.

The score is generated out of a given pool of words. Each musician plays in front of his (or her) own computer running a version of the application. The computers are not connected within a network. The score consists of a word combination in 4 lines. In the topmost line, there is one of five "gestures," which are pre-defined by the composer: drone, pulse, burst, chute and cloud. The score-generating system guarantees that the same gesture will never appear twice in a row, but rather a minimum of four different gestures in sequence. Below are three additional lines of advice from Essl, which he titles "Haiku". The "Haiku" implies an algorithm for generating this part of the score. Each line of the "Haiku" corresponds with a part of a sentence. Each line is generated independently; the single components are not dependent on each other. The content of the first line is drawn out of a pool of 368 word combinations describing duties, the content of the second line
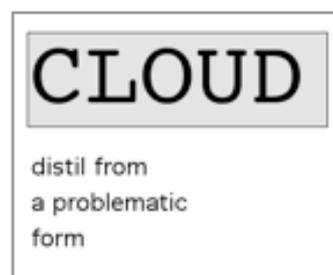

Figure 1. Example of a score, screenshot of "more or less" (application "more or less", version for Apple Macintosh, 2010.06.07)

out of a pool of 116 word combinations referring to identifications, and the content of the third line out of a pool of 206 words for objects. In hitting a key on the computer's keyboard, the application generates a new combination of words.

The score

The score is presented in a rectangular white window with a black frame, consisting of two optically separated components. At the top is the "gesture," written in capital letters, accentuated by a grey background. Below is the "Haiku," written in lower case letters using white sans-serif font over a black background. The combination of gesture and "Haiku" establishes the playing instruction. The "Haiku" is intended as a description of the gesture, with the aim of encouraging a wider range of interpretation. Essl says: "The "Haiku" should be "solved" by the musicians [which will] influence the interpretation of the required structure to a great extent." (www.essl.at/works/more_or_less.html, 2011.01.15) All gestures are described quite carefully by the composer, indicating the main sound quality:

Drone

Select one long sustained sound and play it as long as you wish. Make a pause which length you determine yourself, and then play the same sound again. Continue this operation as long as this structure lasts in a soft dynamic with long crescendo and decrescendo.

Figure 2. Description of the structure "Drone" taken from Essl's website (www.essl.at/works/more_or_less.html, 2012.09.28)

The possible content of the "Haiku" is not listed in the work's description. There is a very low possibility that the same "Haiku" will be drawn twice, but there is no limitation concerning the drawing order or the conditional probability for a single object. In order to guide (determine?) probability of the "Haiku"'s content, the composer inserted the same object into the pool several times.

Interpreting "more or less"

In the work's description, Essl describes the interpretation of the gestures as an improvised phrase of undetermined length. Additionally, he gives gives the following advice: During the performance, each musician can request a new playing instruction at any time, but there has to be a pause before playing a new gesture. While interpreting the score, the musician also has to listen to the rest of the ensemble and react to what is being played. S/he can, for instance, interact by
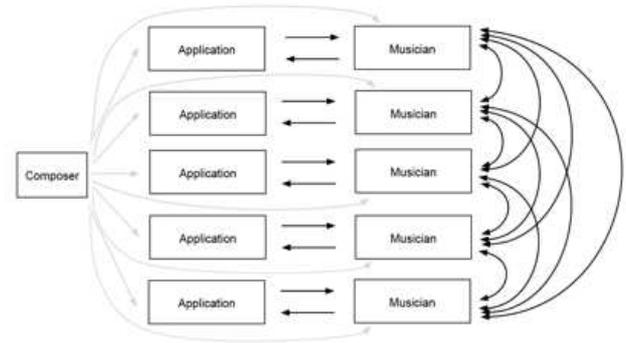

Figure 3. Schematic interaction structure of "more or less": the black arrows show the direct interaction, the grey ones show the inherent one.

requesting a new playing instruction if the one shown on the screen is not in-line with their interpretation at any given moment.

On his website, Essl documents 29 performances of "more or less", starting in 2002. The first version of the work was designed as an internet application. The listener/internet-user could interact with the application which in turn influenced the score being shown on the interpreter's screens. This project was not realized. Instead, the composition "more or less" for five performers was premiered in 2002 by the Het Nieuw Ensemble in Leeuwarden (NL)[3]. That version, which is the one being analyzed, does not connect the computers within a network. Only the musicians are able to request new scores. While Essle assigns the number five as the ideal number of musicians it has also been performed by ensembles as small as three and as large as seven musicians, as well as by a soloist. In 2012, Essl presented the piece at a master class at Wilfrid Laurier University, Waterloo (Canada). There, Essl named "more or less" an "improvisation environment" (Essl 2012) and it was performed by a trio. Important interpreters of "more or less" include Ensemble Champ d'Action (Brussels)[4], which was strongly involved with the predecessor composition "Champ d'Action", and Ensemble Integrales (Hamburg)[5] which released it in 2008 on their CD "Alpenglühn" under the Col Legno label[6]. Listening to the recordings there seems to be a shared aesthetic direction. This cannot be interpreted directly from the score, since Essl asks the musicians to improvise on it. It may, however, result from the rehearsals the composer has held with both ensembles, and also from the fact that both ensembles have played other compositions of Essl, e. g. "Champ d'Action". There exist several other (invisible) factors which have influenced various performances of "more or less" and its sound aesthetic, such as Essl's participation as a musician in almost all its
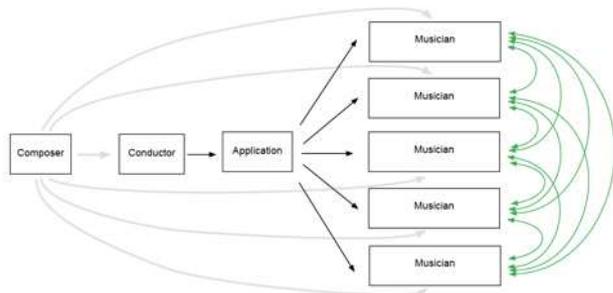
Figure 4. Schematic interaction structure of "Champ d'Action": the straight black arrows show the direct interaction, the light grey ones on the left show the inherent interaction, the dark grey, bi-directional arrows on the right side stand for the interaction which is requested but not demonstrable

performances up to 2005. With Ensemble Champ d'Action, the composer played the first perform-ance, then handing his part to Serge Verstockt, the leader of the ensemble. Verstockt says that it is quite difficult to play "more or less" without knowing a lot of the background, since there are inherent references to the composer's musical language, especially concerning algorithmic com-position. For him, using it as a base for improvisa-tion may be possible, but it lacks a lot of the in-herent interpretation (Verstockt 2010). Burkhard Friedrich, leader of the Ensemble Integrales, also worked a lot with Essl before playing "more or less". He appreciates the challenge of reacting to and reflecting on the live score while playing. Fur-thermore, he sees the score as a starting point for improvising: it has the potential to transform into a new, independent improvisation as it progresses in time (Burkhard 2010). This interpretation re-sembles Essl's own description of "more or less," which he recently gave in Canada.

Even though the invisible, "weak" factors are not completely identical, they are based on the com-poser's background and on the knowledge of his work. The early interpretations of the composition set a musical orientation for future performers, as most of the interpreters knew Essl's work. This is important since it results in interpretations that follow the author's intention even though the score and description give little aesthetic guidlines.

Predecessor "Champ d'Action"

To better understand the compositional structure of "more or less", it is helpful to look at its prede-cessor "Champ d'Action". "Champ d'Action" was composed in 1998 for an ensemble of five musi-cians and is subtitled "real-time composition envi-ronment for computer-controlled ensemble". The score is created by an application which gener-

ates a complex combination of playing instruc-tions: on the top left there is a graphical element, in the middle there are four global parameters which are described by a 3-step specification (?), and at the bottom up to two more descriptions can be added. The individual score is displayed in a window on each musician's screen. A conductor guides the ensemble by accessing the main com-puter: S/he triggers the Max/MSP patch that runs the score generating application. This main appli-cation sends the individual scores directly to the musician's screens. On the conductor's screen, all currently generated instructions are displayed. The conductor can request new playing instruc-tions and decide whose screen will display it. The instruction is only changed for one musician at a time and the musicians are not able to request a new score. Furthermore, there is the possibility to request a new instruction by an external source if provided.

The score gives a sophisticated description of the sound that should be produced by the musician. There are eight different graphical elements, signi-fying gestures which are clarified in the title next to the graphics: points, planes, drones, figures, solos, clouds, trills, and repetitions. The sound quality of each gesture is defined in the work's description. The four "global parameters" (phrases, pauses, registers and sounds), which are also defined in the description, indicate dura-tions, pitch registers, timbres of sounds and pauses. They are specified by a three-step scale which sits prominently in the middle of the instruc-tions. The gestures' description refers to the global parameters: Figure 5 shows the global pa-rameters. They describe length, pitch range and sound quality of the sounds which have to be played while interpreting to the gesture "Figures". The descriptions at the bottom are also connected to the gesture in order to add more abstract speci-
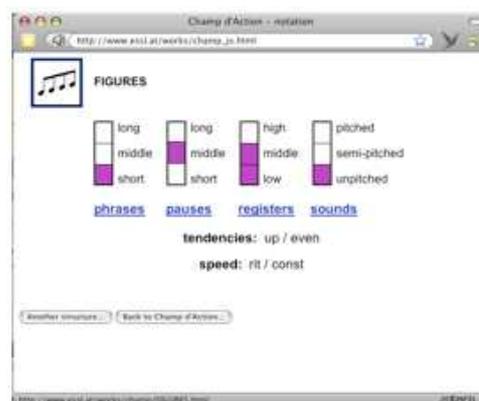

Figure 5. Example of a score, screenshot of "Champ d'Action" (application "Champ d'Action", online version, 2010.08.10)

fications. The gestures "Solo" and "Drone" have no further description. The additional playing instruction "tacet" means a general pause for the musician. It includes a preview of the upcoming instruction.

For the musicians, interpreting "Champ d'Action" is very challenging. They have to improvise upon the gesture while considering the described sound quality and reacting to the conductor's influence. Additionally, the composer asks for musical communication between the improvisers. Essl often performed the conductor's part of "Champ d'Action" which enabled him to request specific sound qualities, to influence the density of the performance, and to guide the ensemble's interpretation.

From "Champ d'Action" to "more or less"

The same general set-up is maintained: both pieces are designed for five musicians playing instructions which are generated by an application and displayed on screens. The subtitle makes reference to the most important difference: instead of a "computer-controlled ensemble" where one computer controls the whole ensemble, it changes to "computer controlled soloists" where five computers independently influence five musicians. In "Champ d'Action", direct interaction between musician and computer is not intended. Instead, the conductor guides the structure of the performance. It implies that the musicians can only react to external influence and not actively push the performance in a new direction. The structure of the first internet-version of "more or less" included both levels: external influence and emancipated musicians. The Internet user was able to request new scores for the musicians, but the musicians were also be able to request new scores themselves. In the recent version of "more or less" there is no external guidance but rather a group of "self-governing" musicians.

While the structure of the interactions becomes more complex, the score is simplified[7]. In "Champ d'Action", the musical interaction between the musicians is limited due to their concentration on the score. The range for free associations with the gestures is limited by precise guidelines which carry the composer's ideas. In contrast "more or less" almost completely relies on associative improvisation and musical communication.

Nevertheless, both pieces do not give a description of the sound aesthetics. Essl rehearsed both pieces intensively with the performing ensembles and also often joined the performances as musician. He recommends that the compositions be performed by well trained musicians who are experienced in classical contemporary music and improvisation. Verstockt furthermore suggests a good knowledge of the composer's work. When respecting this, the space for "free interaction" also in "more or less" is clearly guided by instructions which include the expectations of the composer by silent commitment.

The position of the computer in the compositional process

In "more or less", the computer works as an extension of the composer. Essl composes a system of containers which are filled along combinatory processes. The computer executes these combinatory processes instead of the composer, and implicitly also takes over the final decision of the explicit combination of the score. The variety of the instructions, however, is clearly defined by a system that Essl puts in place. The range of the decision which is handed over to the computer can be seen as quite small in terms of compositional determination. The algorithms work regularly and do not produce new content but a huge variety of combinations of the inherent content.

Generating score in real-time belongs to the field of real-time composition. Hajdu states that "[c]omposition and notation of musical scores in real-time is one of the great remaining challenges of computer music" (Hajdu 2008). It is a more recent phenomenon which strongly relies on the computer's performance. During the performance, the final output is completely handed over to the computer. Computer-assisted composition systems usually do not work in real-time. The composers can redo structures or rules if the computer's output is not satisfying. Both systems, however, are part of a discussion about authorship. What is the position of the computer in a context where it generates the final score? For real-time generated scores, Winkler argues that the composer is the only real "author" of the piece (Winkler 2004).

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[1] Karlheinz Essl (*1960), Austrian composer, studied composition and electro-acoustic music at Musikhochschule in Vienna as well as musicology at University of Vienna. His work as a composer includes real-time and interactive compositions, electronic music and sound installations (Günther 2001).

[2] The RTC library – Real Time Composition Library - was developed by Karlheinz Essl and others, starting in 1992 at Institute de Recherche et Coordination Acoustique/Musique IRCAM in Paris while working on his composition Lexikon-Sonate. It initially contained patches and extensions for Max/MSP/Jitter. Since 2010 there exists also a version for Pure Data PD (www.essl.at/works/rtc.html, 2012.12.14).

[3] Het Nieuw Ensemble (Amsterdam) with John Snijders (prepared piano), Herman Halewijn (percussion), Jeroen den Herder (cello), Wiek Hijmans (electric guitar) and Karlheinz Essl (computer and electronics). The ensemble performed three concerts in 2002.

[4] In March 2004, there was the first performance of "more or less" by the ensemble Champ d'Action with Stefan Prins (prepared piano), Tedor Teunisse (percussion), Joachim Devillé (trumpet, flugelhorn), Thomas Olbrechts (saxophone), and Karlheinz Essl (computer and electronics). In the same year, the ensemble played three more performances in different line-ups with Jaan Bossier (bass clarinet), Tom Pauwels (electric guitar), Marcel Andriessen (percussion), and Serge Verstockt (sound projection & live-electronics). Essl only played one performance.

[5] In 2004: Ensemble Integrales (Hamburg) with Burkhard Friedrich (saxophone), Claudia Birkholz (prepared piano), Stefan Kohmann (percussion) Barbara Lueneburg: violin), and Karlheinz Essl (computer). In 2006, Essl was subsituted by Marko Ciciliani (electronics).

[6] Additional, there exist private recordings of rehearsals of the ensembles. Further recordings can be found on youtube (e.g. www.youtube.com/watch?v=-7YqiNMTQGY, 2012.12.12) and on Essl's website (www.essl.at/works/more_or_less, 2011.01.15).

[7] The graphical elements were dropped. The gestures "Drone" and "Cloud" remained. The other gestures were implemented within three new ones: "Pulse", "Burst" and "Chute".