PROGRAMME NOTES

Mélange à Trois

(Blue - Version III)

les départs – la relation bleue – les cloches anglaises – la relation jaune – la solution

For cyber string trio on the Internet by means of live-media streaming technology

Introduction

A violinist in Warsaw, a cellist in Oslo and a viola player in Helsinki are connected via the Internet by means of live media (audio/video) streaming technology. Due to the imposed restrictions of net protocol and streaming technology, considerable irregular and unpredictable delays will necessarily occur. In the worst case, destructive net congestion may cause complete drop-outs of audio-visual contact.

How does a traditional ensemble, a string trio, generally considered to be of such musical purity and where each musician is so closely linked to the others in both the physical and the mental sense; how can such an ensemble cope with this situation? Each player is remotely located (even in different time zones!). What will happen if the three musicians are unable to synchronously hear or sense each other during the performance?

As for the music itself, is it possible to create a composition for live ensemble without a common time-line, a music existing in more than one time dimension? Can music survive under such conditions?

The System

LIVE-MEDIA STREAMING TECHNOLOGY

Real-time media transmission over the Internet is currently very popular worldwide. Video conferencing, Internet telephone, Internet TV & radio stations, etc. are hot topics at the moment. However, real-time audio/video signals present special needs for network transmission. Audio/video is time-critical and it needs Quality–of-Service (QoS) transmission. The main problems in Internet real-time audio/video are latency (network delay) and maintaining the bandwidth. The current basic Internet architecture unfortunately allows absolutely no control over either of these factors. On the contrary, over the Internet, latency may vary and it is extremely difficult to estimate its value. Especially from the audio point of view, latency is extremely harmful, since it generates disturbingly audible breaks. Bandwidth sets limits to the sound quality. Internet telephone

and videoconferencing provide point to point connections which avoid latency by compromising seriously on the sound quality - a limitation more acceptable when only speech is involved.
All streaming technology uses very sophisticated compression methods. The compression process is called “encoding” and is the first step in deploying streaming media.

Reference: Rahkila, Martti; Huopaniemi, Jyri. 1997.
Real-time Internet Audio - Problems and Solutions.
AES 102nd International Convention, Munich, Germany, March 22-25, 1997.

REALMEDIA

One of the most widespread media broadcasting tools is RealMedia (RealAudio and RealVideo) from RealNetworks (http://www.real.com). Compared to other methods of streaming, it is capable of transmitting high-quality audio and video suitable for netcasting live concerts and live events.
The system embraces three components: encoding of the live media, transferring it to the Internet, receiving it from the Internet. Reception of the media stream requires the playback program called RealPlayer, downloadable (free of charge) from the company’s web page. A net-audience can see and listen to netcasted live concerts and their recorded archives, on demand, by using one of the popular browsers with RealPlayer installed as a plug-in.

BUFFERING

RealMedia uses the so-called 'buffering' technique as an essential part of its real-time media delivery. The playback software (RealPlayer) starts by downloading into the user’s computer memory a small portion of the media before commencing playback. Once a pre-allocated amount of media has been buffered in this way, playback of that preloaded material begins. As the user listens to the first section, RealPlayer continues background downloading of the next section of the media stream into the memory buffer. This advance buffering of the audio/video material can largely overcome the latency problems caused by network congestion or server sluggishness.

DELAY

However, buffering means delay. It takes about 10 seconds to buffer live media data. Even after streaming starts, it takes a further few seconds (depending on many different factors) to reach the receiving end, i.e. the user. Ultimately, music/video transmitted from one location (or site) will be seen and heard at the receiving end around **12 – 15 seconds later**. This delay time is not constant and is never predictable. In the event of a serious download delay, a drop-out of whole sections of the data may occur and playback will cease; **the video picture freezes and the music stops!**
These are most crucial problems when composing music for a remotely located ensemble.

Nonetheless, the key to this particular composition project lies in the interesting delay phenomena and accidental, unpredictable drop-outs of sound inherent in our present technology. These factors inspire the composer to adopt a completely new approach to the task of creating "music".

Scenario

The violinist is located in Warsaw, the viola player in Helsinki and the cellist in Oslo. The geographic distances between these cities are Helsinki to Warsaw 950km,Warsaw to Oslo 1050km and Oslo to Helsinki 800km.

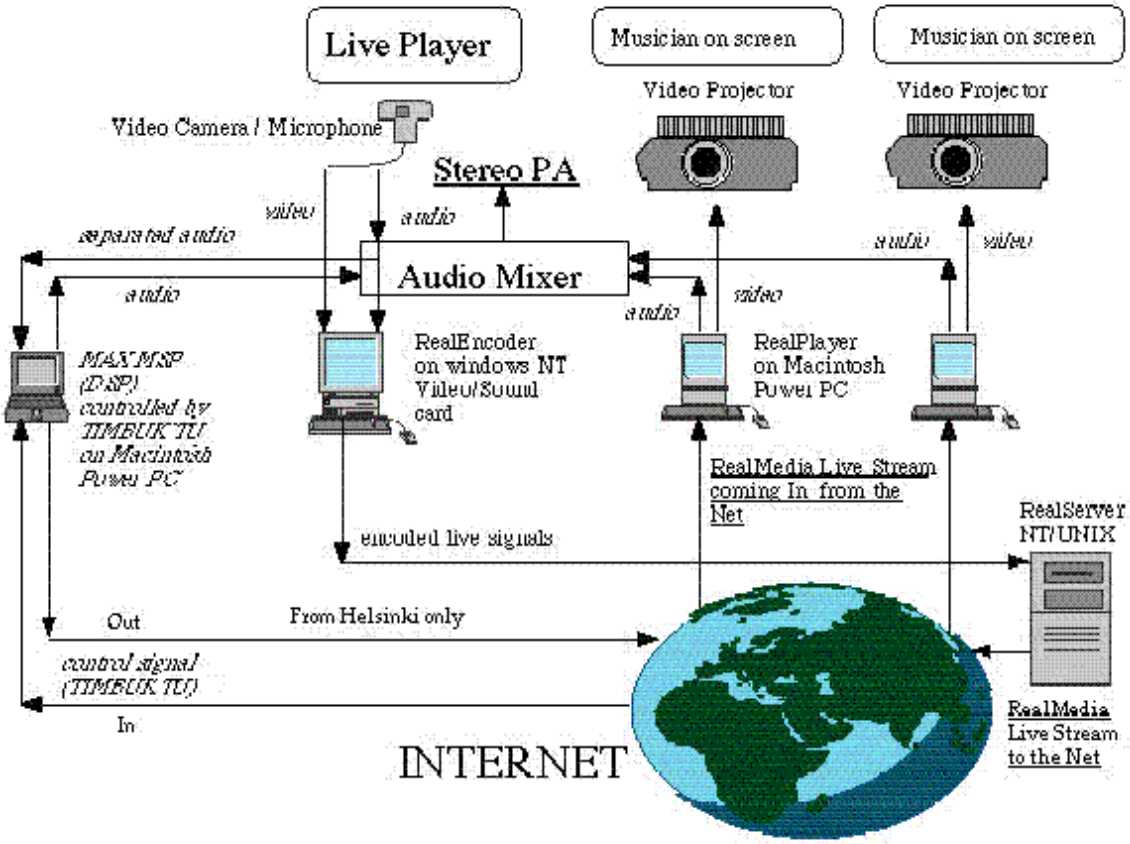
In terms of Internet communication, there are many routers and gateways that channel music/video data between these three cities. There is no way to trace or determine which will actually be used within any single transmission. Connection between Warsaw and the two Nordic cities is via Stockholm using satellite. Delay times are always undetermined.

At each site the resident musician can hear the two remote musicians separated and isolated in the left and right channels of a stereo image, and can also see a video picture of them, projected on two adjacent screens. However, as mentioned earlier, the sounds and pictures are delayed (typically 10 – 15 seconds).

REMOTE DSP

An additional level is added to the musical experience with the DSP (digital signal processing) programs, written in MAX MSP, a programming language developed at IRCAM (Institut de Recherche et Coordination Acoustique / Musique) (http://www.ircam.fr/msp). This DSP is used to electronically modify the acoustic string sounds during performance. The modification is controlled live and remotely by the composer in Helsinki, using the special remote TCP/IP (Internet) remote control application, called TimbuktuPro. With the aid of this fantastic program created by Farallon Computer (http://www.Farallon.com), the composer can take complete control of the remote Macintosh computers in Warsaw and Oslo as if they were right there in front of him. The composer thereby acts as an added fourth musician to the ensemble.

TECHNICAL SET-UP

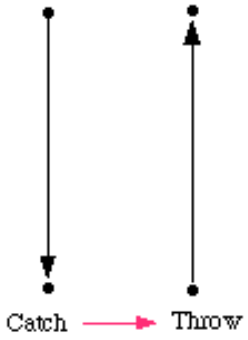


Communication

REAL-TIME COMMUNICATION BETWEEN THREE MUSICIANS AT THREE REMOTE PLACES USING THE REALMEDIA SYSTEM

The unavoidable delay times, intrinsic to the live-streaming process, limit real-time communication / interaction to just a few alternatives:

Catch-ball: One performer throws a piece of information (audio/video) to another. The recipient reacts and throws it back either the same or processed, or possibly even something completely new.



Catchball

A Loop: One player continuously throws out packets of information. Another player receives, reacts and throws back either the same, or processed or completely new information. This creates a constant loop of communication

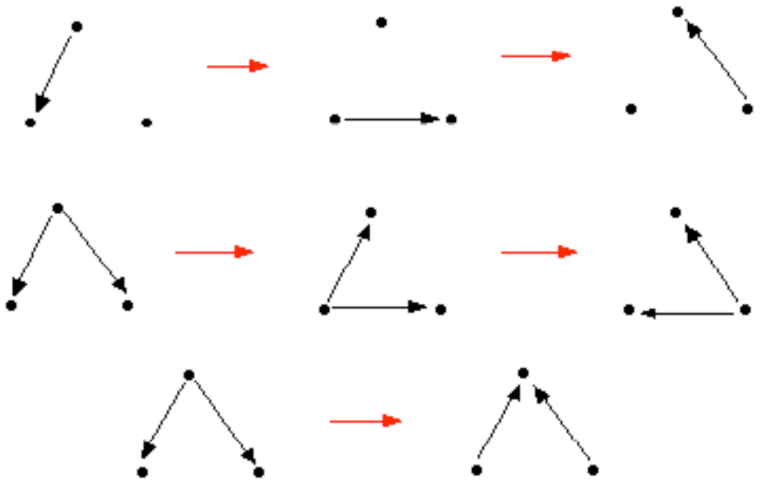
Loop

Simultaneity: Each participant simply throws out information simultaneously, regardless of content. No genuine interaction occurs.

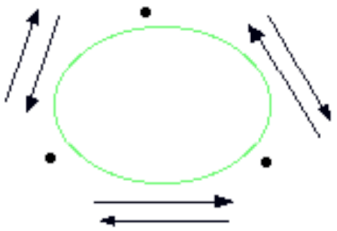
Simultaneous

The information can comprise intellectual content, volume levels, dynamic gestures and so on.

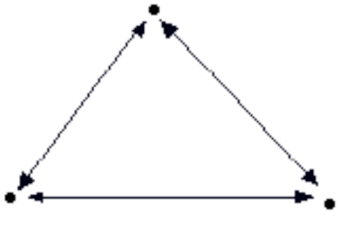
The above communication patterns can also be applied to three musicians located in three remote places, resulting in further levels of complexity.



Sequencial Catchballs



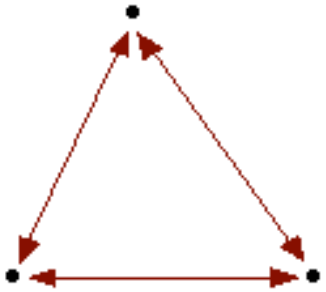
Loop



Simultaneous

THE TRADITIONAL STRING TRIO

Communication and interaction between three closely located musicians, the format of the traditional string trio, is reminiscent of a multiparty conferencing setup. Hearing and responding to each other occurs almost instantaneously. The transmitted information is of a high quality and comprises intellectual content and an enormous amount of dynamic musical gesture.



MUSIC IN A SINGLE ABSOLUTE LINEAR TIME SEQUENCE

Whatever the style, music has always been created and performed according to one obvious condition: a single absolute linear time sequence. Music for ensemble is traditionally performed at one location, with all musicians sharing the same time sequence.

Title

The title “Mélange à Trois” (as opposed to "Ménage") hints at a three-sided love relationship. With the traditional string trio, the violin may sometimes find itself in a synchronized embrace with the viola. On other occasions the viola may partner the cello and exclude the violin. All three may interact closely or go completely their own ways. This changing relationship is musically symbolized with the various communication patterns described above. In the last section “la solution”, unification will hopefully be achieved and a true interaction will be born, creating a new kind of co-existence regardless of the distant locations and the diverse time zones.

BLUE - VERSIONS I AND II

Blue - Version I was composed in 1996 for electric string trio. The entire composition consists of a single chord and was composed for a large hall with an especially long natural reverberation time. The premier was held the same year in the entrance hall of the

Ateneum, (the Finnish National Art Gallery). A second performance was given the following year at the hall of the Culture Center at Espoo city, in Finland. A third performance is planned for 1999 inside the large Aquarium Museum at Kobe, in Japan.

Composition of Blue - Version II, for large orchestra and electric string trio, is still in progress. As a modification of Version I, it retains the single chord structure. However the entire texture is written in an impressionistic style.

Mélange à Trois was planned as the third, Internet (virtual time and space) version of Blue.

The work consists of 5 sections: les départs –la relation bleue – les cloches anglaises – la relation jaune – la solution

Total duration: around 30 minutes

The musical quotation heard in the work is taken from the DIVERTIMENTO (trio) in E flat major (K563) by W.A.Mozart.

Colours

Blue is associated with two persons: Yves Klein, French painter (1928 – 1962), and Derek Jarman (1942-1994), English artist, film director, who made the 1993 film called "Blue" inspired by the former French artist.

The texts quoted in the last section are from Remarks on Color by Ludwig Wittgenstein.

The blue and yellow referred to in "la relation bleue" and "la relation jaune" are also suggestive of the colours of the Swedish national flag. As mentioned earlier (see "The System" above), there is actually, from a hidden technical point of view, one more city involved in this concert. The main network hub located at Stockholm coordinates the Internet cabling connections between Central Europe and the Nordic countries. All the concert data must travel via this central hub.

Netcasting

Due to the varying delays occurring between the three locations, each site will both produce and experience different music!

The three versions of the live concert will be simultaneously netcasted through the Internet to the global Internet-audience who will be able to follow any one of them with their own individual computers.

Cast

Concept & composition:	Shinji Kanki	
MAX MSP programming:	Janne Nummela / The Acoustic Laboratory of the Helsinki University of Technology & Shinji Kanki	
Live DSP operation:	Shinji Kanki	
Violin:	Dobroslawa Siudmak	(in Warsaw)
Viola:	Max Savikangas	(in Helsinki)
Cello:	Paulin Skoglund Voss	(in Oslo)
Camera/video projection team:	Students of The Centre for Music and Technology, Sibelius Academy	
Technical set-up:	Helsinki: SACMUS (Sibelius Academy Computer Music Studio), The Computing Center of Sibelius Academy (http://www.siba.fi/atk) Warsaw: ICM, Warsaw University (http://www.icm.edu.pl/) APEXIM (http://www.apexim.com.pl/) Oslo: NOTAM (The Norwegian Network for Technology, Acoustics and Music) (http://www.notam.uio.no/)	
In association with:	The Doctoral Study Unit / The Department of Solo Performance, Sibelius Academy	
Executive producer:	Krzysztof Knittel / Warsaw Autumn Festival (http://www.warsaw-autumn.waw.pl/)	
Co-producer:	Andrew Bentley / The Cenre for Music and Technology, Sibelius Academy	
WWW direction:	Marta van der Haagen (http://www.xs4all.nl/~martavdh) Wojtek Sylwestrzak The computing Center of the University of Warsaw (http://sunsite.icm.edu.pl/warszawska-jesien/)	
Concert direction:	Jarek Kapuscinski	

1998-8-31 Helsinki
Shinji Kanki