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INFORMATION ON NEXT MEETING

The European CARROUSO Project and Wave Field Synthesis

Thursday, 5th of December 2002, 18h30-20h30 at Studer Professional Audio AG, Althardstrasse 30, 8105 Regensdorf

SPEAKER: Dr.-Ing. Renato Pellegrini
ORGANIZER: Attila Karamustafaoglu LANGUAGE: German/English

A research project funded by the European Union and co-financed by the Swiss government is investigating recording, transmission and rendering of 3D audio content using the MPEG-4 standard. It is called "CARROUSO" (Creating, assessing and rendering in real-time of high-quality audio-visual environments in MPEG-4 context) and runs since the beginning of 2001. Since then, the consortium of ten partner institutes and companies has developed various prototypes of hard- and software. Studer as one of the two Swiss partners (the other is EPFL) is mainly working on the rendering task and has conducted various research tasks for the rendering side.

Unlike the current surround sound approaches as 5.1 or similar formats, wave field synthesis has the goal to recreate a desired sound field within a defined area. For example, imagine the best listening area of a concert hall within a living room. Ideally, the sweet spot restrictions, very well known from the surround systems are obsolete and even listeners sitting next to a wall can have a natural listening experience. To achieve this, the principle of the famous Dutch mathematician Huygens who lived in the 17th century is combined with high-performance digital signal processing.

At the meeting of the 14th of July 2001 with the title "The use of digital signal processing in loudspeaker technology", visitors already had the occasion to listen to the newly built flat panel array loudspeakers with a basic form of signal processing. This time the whole evening will be dedicated to Wave Field Synthesis, the main idea of reproducing truly 3-dimensional sound. R. Pellegrini will give an overview of the theory and the current state of the project followed by a listening demonstration. The actual version of the setup has 40 individually processed channels with an algorithm that allows rendering the reproduction of different rooms and using virtual source positions and desired room acoustics.

One might think that it is impossible to set up 40 loudspeakers within a normal room, but since flat panel array speakers are used, they are in fact less critical in their setup and could be even less disturbing than a 5.1 setup.

Being first perceived as a futuristic idea, the topic is now getting more and more popular and looking to the program of the upcoming Tonmeistertagung it can be seen that a whole paper session is dedicated to the new technique. An optional dinner will be held after the meeting at the Trend Hotel nearby.

Biographical Notes

Dr.-Ing. Renato Pellegrini received his master's degree in Electrical Engineering at the ETH Zürich in 1996. He then joined Studer professional Audio AG and was part of the team that developed one of today's flag-ship mixing consoles, the D950. In 1998 he started research work at Prof. Blauert's "Institut für Kommunikationsakustik" at the Ruhr-Universität Bochum working in the virtual-environment group. He finished his PhD last year called "A Virtual Reference Listening Room as an Application of Auditory Virtual Environments". R. Pellegrini is now working as a researcher within the CARROUSO project in the name of Studer Professional Audio AG.

REPORT ON PREVIOUS MEETING

EXPO 02 – TV Infrastructure

Tuesday 10th of October 2002, 17h00 at Morat

SPEAKERS: Roland Fischer, TSR
Philippe Kaiser, TSR

REPORTER: Patrick Boehm, TSR LANGUAGE: French

More than 25 people attended the meeting "Expo02 TV Infrastructure" in Morat.

The Expo02 technical manager **Roland Fischer** started with a presentation of the infrastructure installed to broadcast the opening ceremony which was held on the 14th, 15th and 16th of May 2002.
We learnt that 4 concerts were performed simultaneously on the 4 Expo02 sites. Each site was equipped with a reporting bus and 8 cameras, and a central control room was installed in Yverdon. The main difficulty consisted in the transmission of the audio and video signals in the different sites. Other signals such as temporal codes, intercom, signalling (Tally), program output were also available. The overall aim was to distribute 10 SDI video signals and 16 main mixed audio sources, which corresponded in fact to 32 camera sources and 304 audio sources.
The covered distances between the central control room and the 4 "Arteplages" were 48 km for Neuchâtel, 86 km for Morat and 86 km for Bienne. An optic fibre system was selected to transmit the main signals. Due to this choice, the audio delays didn't exceed 3.4 ms on the different sites and 432 µs for the video.

The process went perfectly and proved the robustness of the chosen system.

Then, a view of some opening ceremony extracts enabled us to notice that no asynchronisms were present between the different orchestras of the 4 sites.

The meeting continued with the presentation of the TSR technical associate **Philippe Kaeser** who spoke to us about the installation of a floating TV studio. The challenge was to equip a boat as a TV studio according to given specifications. The equipment included a sound control room, a video mixer, 4 HF cameras and 3 DV cameras.
The numerical transmission of the SDI audio embedded program signal was coded in MPEG-2 format through a 1 watt HF transmitter located on the boat. On the reception side, an uplink bus redistributed the signal to a satellite. Concerning the coordination net, an HF coverage was installed in order to cover the 4 sites using different transmitters in the 160 MHz bandwidth.
Different programmes were broadcasted live, such as "Zig-Zag Café", "Info Régionale" and "Téléjournal" for TSR, "Vis-à-vis" for DRS, and a 12 hour programme for TV5.

At the end of this presentation, we had the opportunity to visit the boat anchored in Morat harbour. Afterwards, about fifteen people shared the dinner at the restaurant des Bains.