

OBJECT BASED AUDIO SEMINAR

WHAT? WHY? HOW?

WEDNESDAY 17 MAY 2017

KEYNOTE SESSION

Welcome - Roger Miles (EBU)

Warm-up / participants survey - Roger Miles (EBU)

Keynote - Editorial, social, marketing future of multimedia contents and the place of sound in this future



Ludovic Noblet (b-com) graduated from the Ecole Polytechnique de l'Université de Nantes, in 1992 with a specialty in electronics, signal processing and real-time computing systems. Ludovic started his career in 1992 at the Thomson Electronics Research Labs. Until 2004, he worked advancing and delivering technologies for digital TV broadcast, first for the US markets and then European ones. In 2001, he took part into the very first IPTV and mobile TV projects. He joined France Telecom in 2004 as an IPTV architect where he managed the technical aspects for the introduction of high definition into the Orange IPTV service. He went on to be responsible for the Video Compression R&D lab at Orange Labs in 2006. He joined Dolby Laboratories Inc in 2010 as a Senior Director, in charge of technology consistency for new video initiatives under incubation and maturation. In 2012, he was appointed Senior Director, Principal Architect for the Broadcast business group of Dolby Laboratories in charge of delivering AC-4 from Research to the business group. Throughout his career, he has developed a strong experience with world class team management, standardization and intellectual property.

In September 2014, he entered b-com as Intellectual Property Director, in charge of building the IP & Licensing activities and managing the value for the technological assets developed by the Institute. In December 2015, he was appointed Director of the Hypermedia research department, in charge of leading and scaling the Research activities on virtual, augmented and mixed reality, advanced media formats and codecs, digital trust and identity, uses and acceptability.

SESSION 1: OBA DEFINITION

Definitions of multichannel/scene/objects and renderer concepts



Florian Camerer joined the Austrian Broadcasting Corporation (ORF) in 1990. From very early on, he has been mixing small programs and working on location. In 1995 he became a staff-sound-engineer ("Tonmeister") mainly in the field of production sound and post-production. High quality audio for documentaries became his field of special interest. In 1993 he started to get interested in surround sound. He mixed the first program of the ORF in Dolby Surround ("Arctic Northeast"), played an integral role in ORF's move towards multichannel audio transmission (starting with the New Year's Concert 2003, Europe's first live discrete surround sound transmission) and is now involved with all aspects of multichannel audio at ORF. He lectures on an international basis especially in dramaturgical aspects of surround sound productions, microphones for surround sound and multichannel audio for HD. Recently he has expanded his international activities to the field of loudness issues, chairing the EBU group PLOUD since 2008. This resulted in the recommendation R 128, a breakthrough in audio levelling. Camerer is also an active member of the AES, the Audio Engineering Society, serving as Broadcast Session Chair on the committee for the past 5 conventions.

Definition and role of immersive audio on human feeling / quality of experience measurement



Matthieu Parmentier (France TV) started his audio career recording classical music CDs. He joined France Televisions in 1999 as a sound engineer for live programs, then in charge of sound recording, video editing and outdoor satellite transmissions for the news department. Since 2008, he has been working as manager for 3D audio and UHD video development projects, also organizing conferences and professional workshops. Matthieu chairs the audio strategic programme of the European Broadcasting Union, the French section of the Audio Engineering Society and chairs or participates in several collaborative R&D projects. He holds two license degrees in sound

recording and video post-production and a master degree in audiovisual research from the Toulouse II University.

Formats and standards, publications and works in progress

Michael Weitnauer (IRT)

SESSION 2: OBA FOR BETTER SOUND ON MULTIPLE DEVICES

SUCCESS OF A SINGLE OBA PRODUCTION WORKFLOW TO DELIVER MULTIPLE FORMATS

Object Audio the Producers view - Producing content for all users

Tim Addy (Dolby) A passionate technologist, systems architect and engineer with 20+ years of full hardware and software product life cycle development experience which has resulted in numerous high quality customer deliverables to market in the Telecommunications, Computer Network and Broadcast industries. In the broadcast industry, Tim has worked in various roles such as research, development, systems design and Architecture roles throughout the broadcast chain working for companies such as Snell & Wilcox, Amberfin and Dolby primarily focussed on Audio technologies and workflows.

Tim has been interested in audio/video technology and production since he first played with an early synthesiser as a kid. A keen musician, who plays a variety of musical instruments and has a passion for electronic music technology.



OBA for better sound on multiple devices • Sound engineer's point of view

The presentation explain how OBA can be used to mix in different format at the same time

Jean-Christophe Messonnier (Conservatoire de Paris) is a sound engineer working at the Conservatoire de Paris. His main research interests are objet-based audio, recording methods and spatial audio.

Manufacturer's point of view

Tom Ammermann (New Audio Technologies)

Broadcaster's / linear and online deliveries

Hervé Déjardin (Radio France)

SESSION 3: OBA TO ALLOW USER-ADAPTATION OF THE RENDERING

ATTEMPTS AND SUCCESS TO PERSONALIZE THE USER EXPERIENCE

OBA and Personalization in the context of MPEG-H Audio

MPEG-H Audio is designed to work with today's broadcast and streaming equipment. Object Based Audio is one of the key features in MPEG-H and allows viewers to adjust the sound mix to their preferences, while the support for immersive audio in MPEG-H improves the level of realism of the listening experience. MPEG-H Audio will also tailor sound for optimal playback on a range of devices and environments, providing "universal delivery" ..

Adrian Murtaza (Fraunhofer IIS) received his M.Sc. degree in Communication Systems from the École Polytechnique Fédérale de Lausanne, Switzerland in 2012 with a thesis on Backward Compatible Smart and Interactive Audio Transmission. Upon graduation he joined Fraunhofer IIS, where he works as a researcher on Semantic Audio Coding, parametric multi-object and multi-channel audio coding and 3D Audio.

Adrian Murtaza actively participates in several standardization organizations, including MPEG, DVB, ATSC, CTA and SCTE, and contributed to several standards in those groups. His recent activity is focused on enabling of MPEG-H Audio in different broadcast and streaming eco-systems.



New generation of receivers: Beam-forming, Transaural and Soundbars

Soundbars allow for the reproduction of 3D binaural material, or a personalised reproduction for different listeners. To the end-users, this opens the possibility of having a great immersive experience at home without the need of placing an array of surrounding loudspeakers on their living room. At the same time, directional sound radiation can be used to individualise the listener experience; The talk reviews the latest advancements in this field.

Dr Marcos Simón is a 3D audio scientist within the Institute of Sound and Vibration Research. Marcos Simón graduated in 2010 from the Technical University of Madrid with a BSc in telecommunications. After a short time working in video engineering, he came to the University of Southampton, where he pursued an MSc in Sound and Vibration. In ISVR, he got a PhD working in personal audio with loudspeaker arrays for improving speech intelligibility in hard of hearing people, and also in the modelling of cochlear mechanics. He is currently working on the S3A spatial audio program "Future Spatial Audio for an Immersive Listening Experience at Home". In 2013 he has been awarded with the IOA young persons' award for innovation in acoustical engineering and the Sociedad Española de Acústica (Spanish Acoustical Society) Andrés Lara prize for young scientists. He has interests in binaural audio and is quite keen about funk, flamenco and motorcycles.

OBA and realisable benefits for accessible broadcast services

Fadi Malak (DTS)

Producing clean audio and objects for accessibility

Matthieu Parmentier (France TV)

Reverberation techniques for object-based audio

Olivier Warusfel &



Markus Noisternig is Researcher at IRCAM, CNRS, Sorbonne Universities–UPMC in Paris, Senior Lecturer at the Institute of Electronic Music in Graz, and lectures at the Karlsruhe College of Arts and Design. As an undergraduate and postgraduate he studied Electrical Engineering and Audio Engineering as well as Computer Music Composition at the University of Technology and the University of Music and Performing Arts in Graz, Austria. He was a research scientist and lecturer at the Institute of Electronic Music and Acoustics in Graz, and worked as a researcher and developer for AKG Acoustics, Vienna (2002-2007). In 2007, he was promoted senior lecturer at the IEM/KUG and continues teaching signal processing, spatial audio and room acoustics since then. He has been a researcher in the Audio and Acoustics Group at LIMSI-CNRS, Orsay, France (2007-2008), and in the Acoustic and Cognitive Spaces Research Group at IRCAM, Paris, France (since 2008).

Loudness measurement for object-based content

Michael Meier (IRT)

SESSION 4: OBA AND INTERACTIVITY

FROM LINEAR TO INTERACTIVE CONTENTS: SOUND AND TRANSMEDIA

Interactive vs linear audio: friends or foe

Being an audio software creator as well as a project creator, we, at AudioGaming have a rather unique point of view ranging from Tools creation to finished content, working on both linear and interactive forms. I will detail the different approaches we have on linear vs interactive projects and also how we think both sides will gradually merge thanks to new approaches like VR spatialised audio.

Amaury LaBurthe (Ubisoft – Canada) started to work in audio research through a master at IRCAM and then as assistant researcher at Sony-CSL. I worked more specifically on MIR (Music Information Retrieval) as well as creative approaches to music creation. I then worked as lead audio for Ubisoft Montreal-based studio where I worked on 3 video game licences: Prince of Persia, Splinter Cell, Far Cry. I founded in 2009 AudioGaming, a company focused on creating innovative audio Tools. We mostly work on procedural audio, interactive Tools and object based approaches. We created in 2013 Novelab, a creative studio focused on the creation of interactive experiences.

Producer's experimentations in VR storytelling



Immersion in Virtual Reality: what are the implications for storytelling and elements for producers to take into account? What next? A glimpse of VR content from around the world.

Urszula Gleisner (Vision Factory – Poland) graduated with MBA in Audio-Visual Production and MBA in International Business in France, is expert in multiplatform content, transmedia and virtual reality. Her experience of 17 years in international business companies (Hewlett-Packard, Thomson) and 10 years in new media (Technicolor, Framepool, Vision Factory, Gleisner Consulting), enables her to understand producer objectives and translate them into business propositions. She is a globetrotter who knows the specificity of Western and Eastern European market. Trilingual (French, Polish, English). In work she uses marketing and media background in order to construct efficient multiplatform content & digital strategy. She

organized festival Learn Do Share in Warsaw, co-organized Screen4All training course « Campus » one of the largest professional VR events in France.

Broadcaster's point of view



Lidwine Hô (France TV) works as an R&D project manager at France televisions. She has been in charge of contents productions on Bili: collaborative project on binaural listening. She works now as support of contents creators on VR and binaural. She's also in charge of organization of vocational training on sound for new technologies in TV industry. Lidwine started her audio career in 1995 working on sound editing, foleys and voice recording on TV movies, and mixing of documentaries. In 2000 she joined a young french radio: le mouv', as a sound engineer. Since 2002 she has been working on musical TV shows, movies and live music as sound engineer.

5: FUTURE OF TOOLS AND WORKFLOWS

OBA AMONG OTHER CHANGES

3D Panner and objects

Maurice Engler (Merging)

Synergies between Scene-Based & Object-Based audio – Enabling a truly immersive & interactive audio experience

Ferdinando Olivieri (Qualcomm)

MPEG-H Authoring Tools for OBA

The recent development of tools and devices for MPEG-H live and post production will enable broadcasters to offer better audio quality while satisfying their viewer's desire for consistent loudness.

Available as standalone authoring tools, as plugins for Digital Audio Workstations or as consoles for immersive audio production, all these tools allow to audition MPEG-H Audio in the broadcast facilities as it will be reproduced on viewer's device

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Future Tools and Workflows –

Tim Addy (Dolby) A passionate technologist, systems architect and engineer with 20+ years of full hardware and software product life cycle development experience which has resulted in numerous high quality customer deliverables to market in the Telecommunications, Computer Network and Broadcast industries. In the broadcast industry, Tim has worked in various roles such as research, development, systems design and Architecture roles throughout the broadcast chain working for companies such as Snell & Wilcox, Amberfin and Dolby primarily focussed on Audio technologies and workflows.

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SESSION 6: ORPHEUS PROJECT

Introduction to ORPHEUS Project

ORPHEUS is an EU project involving ten broadcasters, manufacturers and research institutions. Our aim is to develop and implement an object-based end-to-end media chain for audio content. The first pilot is a live radio broadcast with functionalities like immersive sound, foreground/background control, speaker selection. ORPHEUS is working towards the publication of a reference architecture and guidelines on how to implement object-based audio in real broadcast environments.

Andreas Silzle (FhG IIS) studied electrical engineering with specialization in acoustics at the University of Karlsruhe, Germany. He worked for 5 years at the Institut für Rundfunktechnik (IRT) and for 3 years for TC Electronic in Denmark. From 2002 onwards he was a research assistant at the Institut für Kommunikationsakustik (IKA) of Prof. Blauert in Bochum and did his PhD about "quality evaluation of auditory virtual environments". He continued at Fraunhofer IIS in Erlangen, where he is currently a senior scientist. He is actively involved in standardization work in ITU R. He is the technical coordinator of the EU project Orpheus about object-based audio.

Object-based and scene-based audio acquisition in Orpheus

This presentation will give an overview of the work achieved with regard to the acquisition of audio data in the Orpheus project. Recording object-based audio remains a challenge for content producers. In order to facilitate this process, we focused our work on two aspects: 1) propose new 3D audio acquisition techniques, in particular involving microphone arrays; and 2) facilitate the integration of these techniques into the existing production workflow.

Nicolas Epain (b<>com) received his Master and PhD degrees from the University of Aix-Marseille, France. In 2007 and 2008 he was a postdoctoral research engineer at Orange Labs in Lannion, France. From 2009 to 2016 he held a research position at the Computing and Audio Research Laboratory (CARlab), University of Sydney, Australia. Since May 2016 he has been a research engineer at b<>com, Rennes, France. His current research focuses on 3D audio and acoustic transducer array design and processing.



IP studio & Radio Production

An overview of BBC R&D's IP Studio system and the tools that have been developed for live production of object-based audio

Chris Baume (BBC R&D) is a Senior Research Engineer at BBC R&D in London, and the BBC lead for the Orpheus project. His research interests span a number of areas including semantic audio analysis, interaction design and spatial audio. He is currently developing next-generation audio production tools as part of his PhD research at the University of Surrey. Chris is a Chartered Engineer and a member of the BBC's audio research group where he leads the production tools work stream.

Integration of Object-Based Audio in Sequoia

A short overview of newly developed extensions to the Sequoia digital audio workstation to integrate with the rest of the new object-based production chain

Marius Vopel (Magix)

Pilots and architecture

Michael Weitnauer (IRT)

Use-cases, user interfaces and content production

Use cases form the starting point in R&D projects – and in the end, you want to know about how they're received. It's seems as simple as that. Well, Within the ORPHEUS project we have to deal with well-established practice - and expectations - in broadcasting that can now 'go beyond' itself through new object-based technology. So in reality, it's more like both ends loose...

Werner Bleisteiner (BR) 25+ years experience in broadcast journalism - radio, television, internet.

Reporter, author, producer, editor for various broadcast editorial departments.

Author of numerous radio documentaries on history and development of broadcasting and audio technology.

Sound director of BR's first Dolby ProLogic radio play in 1998, creator and director of BR's first 5.1 surround radio documentary/soundscape "686868 – Don't you know that you can count me out" in 2008.

Involved in BR's digital radio and media development since 2005. As Creative Technologist now designing and coordinating internal and external innovation projects for BR-KLASSIK's Online/Streaming/TV department.

Lecturer at universities and symposia.

WRAP-UP

Closing words

Hans Hoffmann (EBU)
