5:45 pm | Room 2 | Thursday – Aug. 10

ACADEMIC

CALL FOR PAPERS – SET INTERNATIONAL JOURNAL OF BROADCAST ENGINEERING (SET IJBE) – 2ND EDITION

This panel highlights a selection of scientific works submitted to the Call for Papers promoted annually by SET. The chosen studies will be published in the SET International Journal of Broadcast Engineering (SET IJBE), an international scientific journal dedicated to the dissemination of knowledge in communications engineering, especially in the areas of broadcast and new media. SET IJBE aims to encompass current research that represents the state of the art in these technologies.

Moderator: **João Vandoros**,Consultant

Speakers:

A LARGER SCOPE OF CMAF USAGE FOR VIDEO DELIVERY

Speaker: Robin Hérin,Senior Innovation and Technologies Engineer at Ateme

The emergence of the CMAF file format transformed OTT video delivery with its versatile, ISO BMFF-based architecture, surpassing rival formats in interoperability. Initially, CMAF was utilized for B2C packaging (end-users and players). However, with the advent of the live media ingest protocol, it is set to dominate the B2B video delivery scope. This protocol enables seamless video exchange between various video processing entities (encoders, packagers, CDN, cloud services) through synchronized data and metadata fragments from the original stream. The technology gains immense interest as it offers a modern alternative to the traditional TS format for first mile delivery. The paper covers the protocol's key features, benefits, and implementation architecture.

AN OVERVIEW OF AUDIO TECHNOLOGIES, IMMERSION AND PERSONALIZATION FEATURES ENVISAGED FOR THE TV3.0

Speaker: Regis Rossi A. Faria, School of Arts, Sciences and Humanities - University of São Paulo

Co-speaker: Almir Almas,School of Communications and Arts - University of São Paulo

 / ISSN (Print): 2447-0481/ ISSN (Online): 2447-049X

In 2021 the Forum SBTVD accomplished the phase 2 of the TV3.0 project, comprised of a series of tests of the technologies proposed for this next generation of TVD system in Brazil. The tests were conducted by research groups of Brazilian universities. Particularly referring to the audio coding layer of the system, we carried out at the University of São Paulo 13 groups of tests, as prescribed in a public Call, and could assess the technologies capabilities and versatility in providing a series of new features for next generation of audio in the digital broadcasting system. This paper summarizes the main results of this testing and evaluation phase, and brings an overview of the stimulating new features that content producers and audience would have available to create and consume immersive and personalized services at home.
.

HARMONIZED SUPPORT FOR IMMERSIVE AUDIO INTERACTIVITY IN SBTVD TV 2.5 AND TV 3.0

Speaker: Marcelo F. Moreno, Associate Professor, Federal University of Juiz de Fora (UFJF)

Co-speaker: Adrian Murtaza, Senior Manager, Technology and Standards - Fraunhofer IIS

MPEG-H Audio enables highly efficient immersive audio transmission with advanced accessibility, interaction, personalization, and adaptation features. MPEG-H Audio utilizes audio objects and metadata to allow viewers to interact with content, creating a personalized listening experience. Broadcasters can enable or disable interactivity options and set limits for viewer interactions. This paper details Fraunhofer IIS' proposal for TV 3.0 Project on new high-level immersive audio interactivity APIs for Ginga-NCL and Ginga CC WebServices. These APIs allow broadcasters to develop and deliver multimedia applications to control such advanced audio features, using their own visual identity, graphical design and even the multimodal interaction expected to be supported in TV 3.0. The paper also discusses the implications of audio stream metadata changes, which occurs when the content includes different audio scenes. The workhighlightsthat such API proposal for TV 3.0 is harmonized with current TV 2.5 specifications and, given the increasing number of TV 2.5 receivers supporting MPEG-H audio, these APIs could also be proposed for being included in current standards.

ACADEMIA'S R&D PROGRESS ON TV 3.0 APPLICATION CODING

Speaker: Marcelo F. Moreno, Associate Professor, Federal University of Juiz de Fora (UFJF)

SBTVD Forum's TV 3.0 Project aims to develop the next-generation broadcasting technologies for Brazil. Television has played a crucial social and cultural role in the country, and any technological evolution could lead to significant societal changes. Currently in Phase 3, the project carries out an R&D effort on application coding support, gathering 40 researchers from Academia. This paper focuses on the methodology, progress and early achievements of the Academia R&D team on addressing the high-priority application-coding requirements for TV 3.0. Focus groups

and opinion polls have been contributing to social studies related to the application-based TV experience. The group proposes architectural changes, new user interfaces and a persistent media player for enhanced interactivity and full broadcaster control over all audiovisual content. Moreover, efforts are made to evaluate audio and video codecs, including the adopted MPEG-H audio technology, to identify the need for new APIs in a harmonized fashion with current SBTVD standards. The team also focuses on extensibility support and accessibility requirements, particularly on forwarding captioning and sign language to mobile devices. Work is in progress for sensory effects, immersive content, and multimodal interaction, utilizing the adopted NCL 4.0 and Guaraná proposals to enable advanced mulsemedia applications and 360° scenes. A demonstration of TV 3.0 use case prototypes will take place during SET Expo 2023 to showcase and discuss the progress and the findings of the Academia R&D team.

THE USE OF ARTIFICIAL INTELLIGENCE ENABLING SCALABLE AUDIO DESCRIPTION ON BRAZILIAN TELEVISION: A WORKFLOW PROPOSAL

Speaker: Luiz Kruszielski, Audio Producer - Globo

Recently, Artificial Intelligence (AI) technologies have been gaining ground in various areas of knowledge, significantly impacting many academic and business spheres. One application that can benefit from AI is the inclusion of people with disabilities in audiovisual content, where the scaling capacity of certain processes can bring new accessibility opportunities. In this work, we show what a traditional workflow of an audio description for dramaturgy audiovisual content looks like, and from there, we propose a new workflow for generating audio description audios for visually impaired people using synthetic voice created with Artificial Intelligence models. The proposed workflow simplifies and considerably reduces production time and costs, besides allowing the generation of audios on a larger scale compared to a traditional workflow, enabling a broader reach of the target audience. It also allows multiple people to work simultaneously on the same project while preserving sound identity through the synthetic voice and standardized mixing. With this proposal, we believe that accessibility on Brazilian television can be expanded to serve a much larger audience.

GLOBO'S ULTIMATE OPERATIONAL CHALLENGE: A CREATIVE FULL BASED WORKFLOW EDITING IN CLOUD

Speaker: Priscila David, Product Owner of Post-Production projects in Globo's Media Solutions area

Co-speaker: Ariza Bertelli, Media Solutions Analyst, Globo

In 2022, the famous and epic soap opera "Chocolate com Pimenta" in Brazil became a good surprise for TV Globo: the post-production chain accomplished a simple, productive, and economical workflow. A cloud based, remote and collaborative editing produced the entertainment content in an innovative way. Globo, a free-to-air television network, saw in this path an excellent opportunity to thrive technologically and to offer spectators a unique experience. Globo's objective was to provide a special

 / ISSN (Print): 2447-0481/ ISSN (Online): 2447-049X

edition of the soap opera through Globoplay, an online video on demand platform, and by Open TV. Having the team in charge located at Post-Production Center of Estúdios Globo, the material was edited collaboratively in HD (XDCAM codec) directly connected to cloud. The process was successfully achieved and has helped to maintain Globo into the future of technological innovations. And besides, the business model of this unique approach was very attractive for Globo, solving the market need for a cloud-native solution, notably when the Post-Production Center deals with big files and assets routinely, enabling the increase of the content production to a next level (cost benefit). Globo interprets this initiative not as a mere technological advance, but also as a step taken toward a more concrete operational level. Through all the effortful work, Globo, its customers, and everybody involved in this project could come together to cheer and look forward for a brand-new efficient future.

TOOL IN PYTHON FOR PREDICTING WIRELESS NETWORK SIGNALS IN AN INDOOR ENVIRONMENT USING NEURAL NETWORKS BASED ON MAPPING AND MEASUREMENTS IN THE FIELD

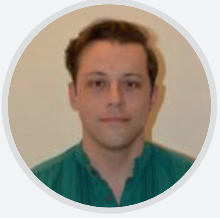
Speaker: Breno Batista Nascimento Silva,Undergraduate student - Faculty of Electrical Engineering - Mackenzie University

This work aims to present the advances and applications of Artificial Neural Networks (ANNs) using the Python programming language. ANNs have proven to be a powerful tool in the field of artificial intelligence, imitating the functioning of the human brain to solve complex problems and perform tasks that previously required extremely elaborate algorithms.

In addition, the importance of Python as one of the most popular and accessible languages for the development of neural networks will be emphasized. Through robust libraries, it is possible to create, train and evaluate neural networks efficiently and intuitively.

João Vandoros, Consultant

Joao Vandoros, graduated in Electrical Engineering from Universidade Presbiteriana Mackenzie and Specialist in Telecommunications from the University of Campinas, has worked in the video distribution and contribution market since 2000, where he began his career at Mackenzie's Digital TV Laboratory. having worked at the companies TVA and Band between 2006 and 2013. Since 2013 as a consultant, he has worked on several projects, with emphasis on those carried out at GfK, Eurovision and Mackenzie - where he currently cooperates in evaluating the physical layer for TV 3.0 through RNP.

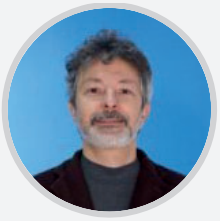


Robin Hérin, Senior Innovation and Technologies Engineer at Ateme

Robin Hérin is a Senior Innovation and Technologies Engineer in the Office of the CTO at Ateme, where he helps the Research and Innovation team develop future technologies for video processing and delivery, as well as leading partnership and standardization projects. Now in his eighth year at Ateme and in his career, Robin previously worked as a Solutions Architect in both South and North America before moving to New York and focusing on expanding Ateme's presence in the Northeast. U.S. Robin holds a master's

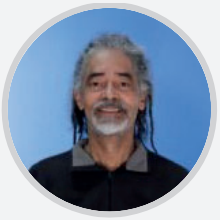
 / ISSN (Print): 2447-0481/ ISSN (Online): 2447-049X

degree in mechanical engineering from the Université de Technologie de Compiègne in France.



Regis Rossi A. Faria, School of Arts, Sciences and Humanities - University of São Paulo

Regis Rossi Alves Faria is a professor at the School of Arts, Sciences and Humanities and the School of Communications and Arts at the University of São Paulo. He works in the interdisciplinarity between arts and sciences, in the areas of audio engineering, sound computing and music, addressing issues related to the creation and reception of sound using technological resources, and developing systems for sound and music. He coordinates the Audio and Music Technology Laboratory at USP (LATM-EACH/USP), is a researcher at LabArteMídia (ECA/USP) and at the Sonological Research Center (ECA/USP). He is a member of the ABNT Audio, Image, Multimedia and Hypermedia Coding Study Committee and is an audio specialist representing the Brazilian Association of Technical Standards at ISO-MPEG.



Almir Almas, School of Communications and Arts - University of São Paulo

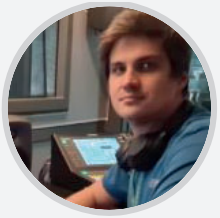
Associate Professor at the Department of Cinema, Radio and Television andresearcher the Postgraduate Program in Media and Audiovisual Processes; General Coordinator of the LabArteMídia Research Group and the Obted Observatory at ECA/University of São Paulo. PhD in Communication and Semiotics. Filmmaker/Video Artist/VJ; Artist of the Cobaia Art Collective. Member of the Board of Directors of the Brazilian Society of Television Engineering (SET). Member of the Brazilian Forum of the Brazilian Digital Terrestrial Television System (FORUM SBTVD). Author of the book "Digital terrestrial television: systems, standards and models", among other books and articles.

Marcelo F. Moreno, Associate Professor, Federal University of Juiz de Fora (UFJF)

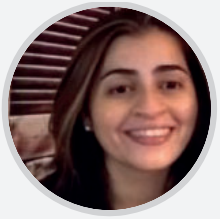
Visiting Researcher at the International Audio Laboratories Erlangen, the Institute for Integrated Circuits of the Fraunhofer Society (Fraunhofer IIS) and the Friedrich-Alexander-Universität (FAU), Germany. He has been an associate professor at the Department of Computer Science at the Federal University of Juiz de Fora (UFJF) since 2011. He holds a master's degree (2002) and a doctorate (2008) in Information Technology from PUC-Rio. He has worked on national and international research, technology transfer and standardization projects in Digital TV, IPTV and multimedia since 2004. Since 2013, he has been leader of Question 13/16 "Multimedia application platforms and end systems for IPTV" of the International Union of Telecommunications (ITU-T), where he also co-leads the groups WP1/16 "Infrastructure for Multimedia Systems" and TG – Media Coding, in "Immersive Media Coding for metaverse applications and services" (in the Focus Group in the ITU-T metaverse). Since 2015, he has been coordinator of the Middleware GT of the SBTVD Forum, leading efforts to standardize DTVPlay, the development of its test suite and its evolution towards TV 3.0. He is a productivity fellow in technological development from CNPq (DT-2).

 / ISSN (Print): 2447-0481/ ISSN (Online): 2447-049X

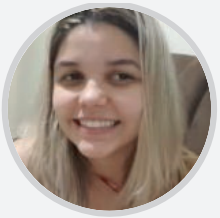
Adrian Murtaza, Senior Manager, Technology and Standards - Fraunhofer IIS
Adrian Murtaza received his master's degree in Communication Systems from the École Polytechnique Fédérale de Lausanne, Switzerland in 2012 with a thesis on “Backward Compatible Smart and Interactive Audio Transmission”. After graduation, he joined Fraunhofer IIS, where he works as a Senior Research Engineer. Adrian Murtaza joined MPEG in 2013 and has since contributed to the development of several technical audio standards in MPEG-D and MPEG-H. He serves as Senior Standards Manager for Fraunhofer at several industry standards bodies, including DVB, ATSC, SBTVD, CTA and SCTE, and has co-authored several specifications within these groups. Most recently, he has focused on specifying next-generation audio delivery and transport in ATSC 3.0 systems and MPEG-2 transport stream-based DVB systems, as well as enabling MPEG-H audio services in different broadcast ecosystems and streaming.



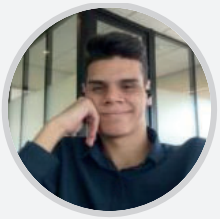
Luiz Kruszielski, Audio Producer - Globo
Luiz Fernando Kruszielski graduated in Sound Production (UFPR - Brazil) and has a master's and doctorate in Sound and Environment from the Tokyo University of Arts (Japan). He has worked as a professional sound designer since 2003 and, from 2013, he started working at Rede Globo as a sound technology researcher, later becoming Sound Producer, where he worked in more than 10 series and soap operas.



Priscila David, Product Owner of Post-Production projects in the Media Solutions area at Globo
Priscila David was born in Rio de Janeiro, Brazil, in 1989. Graduated in Telecommunications Engineering, she has an MBA in Strategic People Management. She was the author of the Poster “4K and 4K-HDR VOD at the Rio 2016 Olympic Games” published by IBC in 2017. She has worked at Globo for 17 years. For the last two years, he has been Product Owner of Post-Production projects in Globo's Media Solutions area.



Ariza Bertelli, Media Solutions Analyst, Globo
Ariza Bertelli was born in Minas Gerais, Brazil, in 2000. She is majoring in Electrical Engineering with an emphasis on Robotics and Industrial Automation. She was a member of the IEEE from 2019 to 2021. She received the award for the 3rd best educational project from RNR: “Falando com as más” in 2020. She had been at Globo for 1 year as a media solutions intern and, in June 2023, as an Analyst of Media Solutions.



Breno Batista Nascimento Silva, Undergraduate student - Faculty of Electrical Engineering - Mackenzie University
Electricity has always been a passion, so much so that at the age of 15 he enrolled in a technical electronics course at Senai Guarulhos, where he decided which college he would pursue. In 2019,joined at the Faculty of Electrical Engineering, through a Mackenzie philanthropic scholarship, where he found several opportunities for personal and professional development. It was during a class during the pandemic that he became interested in the opportunity to carry out a scientific initiation with Professor

Edson Tafeli on Artificial Neural Networks (ANNs) in Python. He currently works as an Accounting Measurement Analyst at the Energy Trading Chamber (CCEE).