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ACADEMIC & SCIENTIFIC

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Lançamento do livro "Para onde vai a televisão brasileira?"
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Distortion Reduction in FIR Filters by Approximation through Window Factor on Function Coefficients
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SDR-WBFM Receiver as an alternative to replace equipment in FM extended
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High Dynamic Range Content in ISDB-Tb System
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Receivers Behavior in a ISDB-T's Single Frequency Network
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We Measured and Have Expanded the Space for More Services in Digital Television
Speaker: RAPHAEL OLIVEIRA BARBIERI – Product Manager / EiTV

News production by machines and ethics: possible implications
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This session aims to present the articles accepted in the SET EXPO 2016 Call for Papers, articles which will be published in SET IJBE, SET International Journal of Broadcast Engineering. In this session we have the latest research and most compelling technologies of TV, Telecommunications, Internet, Broadcast and New Media. The session will be opened by the launching of the book "Where does the Brazilian Television goes? -. Current situation of open TV in Brazil the paths that it can tread" by Mr. LUIZ CARLOS DE MELO GURGEL.

Lançamento do livro "Para onde vai a televisão brasileira?"

Speaker: **Luiz Carlos De Melo Gurgel**
Executive Director / Regional Director (Northeast) - PROSET / SET
Situação atual da TV aberta no Brasil e os caminhos que ela pode trilhar.

- **Editorial e Apresentação da Edição 2016 da revista SET INTERNATIONAL JOURNAL OF BROADCAST ENGINEERING (SET IJBE)**
  Speaker: **Yuzo Iano**
  Editor-in-chief / SET INTERNATIONAL JOURNAL OF BROADCAST ENGINEERING (SET IJBE) & Professor Titular – Head and Founder of the Laboratory of Visual Communications (LCV) / UNICAMP.

- **Capturing Video Stream Audience Over IP NETWORKS**
  Speaker: **Vitor Chaves De Oliveira**
  Engineering – Coach IT Group Inc. / UNISAL / DeVry Metrocamp / SET
  In recent years, the transmission of audiovisual content presented substantial growth in the context of on-demand delivery, made possible through networks based on Internet Protocol, IP. This increase, boosted by internet access omnipresence and new consumption habits of this content, makes this category of communication to be continuously rivaled with traditional broadcasting technologies of Television (TV) signals. Thus, developing techniques to assess the efficacy and risks that the use of IP networks for this purpose imposes becomes relevant. Moreover, while for the named Broadcast TV has technical mechanisms that ensure the quality of this communication are well established, the same does not occur for video stream over IP, or IP Stream. The reason for this is that, for one of them, its technology is equipped with quality guarantees based on a circuit-switching operation in a connection-oriented systematic. While the other, once the web is considered, is unable to ensure quality due to its packet-switching architecture. And this is what sets it as a model called 'best effort' which, besides the features to allow channel sharing and systems interconnection, enables precisely what makes its increase in its use for audiovisual transmission, the application-oriented provision. Thereby attending the consumer's desire for on demand content, subsequently amplifies the role of what and who is on the edge, ultimately placing the user as protagonist. In this IP scenario, it is underlined the lack of mechanisms, related to the Internet, capable of recording two technical parameters that influence the commercial chain that sustains this entire ecosystem, they are: availability and audience. Keeping this in mind and with the goal of evaluating this new method for audiovisual offering, this work has developed methodologies to acquire such information at this

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consumption edge. And this has been accomplished through the construction of a software tool. It was implemented as an extension to one of the most used browsers, Google Chrome, to capture the audience of Internet videos on the leading supplier of videos exists today, Google's YouTube. In this work, the abstractions of considerations around the Quality of Service (QoS) concept, is proposed to be interpreted as a measure of Quality of Experience (QoE) assimilated from time viewed compared against the total time of a video. This justification is founded on the concept that quality translates into a particular subjectivity for each user and their individual expectations, so a measure of time is shown to be an effective thermometer. This effectiveness is justified by a principle consolidated within TV broadcast for decades, audience measurement. Thus, the construction of something analogous to the 'People's meter' in a similar scheme of 'Television Rating Points', TRP, running to capture of information in order to convey assertiveness to all stakeholders involved in this new delivery method. Index Terms: IP Stream, Audience, Connection Availability, Quality of Service (QoS), Quality of Experience (QoE), Software Development.

- **Application of Distortion Reduction in FIR Filters in Dynamic Systems through Computational Methods**
  Speaker: **Sérgio Bimbi Junior**
  Engenharia / Masipack Inc / FATEC
  The article shows a development methodology in the operation of finite impulse response (FIR) digital filters when built on computational methods based on general use processors. Index Terms: Digital Filter, Digital Signal Processing, Low Pass Filter.

- **Distortion Reduction in FIR Filters by Approximation through Window Factor on Function Coefficients**
  Speaker: **Sérgio Bimbi Junior**
  Engineering - Masipack Inc / FATEC
  Filters are time-invariant linear systems which are able to modify the characteristics of the signals connected to their input, so that only a specific portion of the frequency components in a signal can reach the output of the filter. In dynamic systems, digital filters are applied in order to improve system measurements with regards to performance and stability. The present article demonstrates a modification in a low pass filters having Hamming window within the sample space π. In this development, the sample space π is subdivided, wherein equation plots are added within a polynomial of order n. This technique provides the removal of unwanted frequency components in small angular frequency windows, providing the signal with acceleration towards the target when as compared to a low pass filter having Hamming window. In dynamic measurement systems, this feature is relevant, considering that the system shall have grater approximation to its target values, thus implementing an average which indicates the value being acquired in a more accurate and repetitive manner. Index Terms: Digital Filter, Digital Signal Processing, Low Pass Filter, High Pass Filter, Filter Pass Band, Band Reject Filter.

- **SDR-WBFM Receiver as an alternative to replace equipment in FM extended**
  Speaker: **Ramon Mayor Martins**
  Teacher - IFSC (Instituto Federal de Santa Catarina)
  A presidential decree in Brazil authorizing the migration of AM broadcast to FM. To accommodate these stations, the FM band will receive the frequencies of the channels 5 and 6 of analog TV, which became known as "FM extended". One of the barriers found in migration is the acquisition of equipment by the users, as the current equipment does not have the expected range in FM extended. To mitigate this problem, the implementation of an FM receiver using the Software Defined Radio (SDR) for its flexibility is proposed. The receiver was developed in GNU Radio environment, with a simple programming was possible to create a low-cost receiver and can serve as an alternative to users for receiving the new band. Index Terms—Broadcast, migration, receiver, Software Defined Radio.

- **Survey of digital radio standards and updating for rollout in Brazil**

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Speaker: **Ramon Mayor Martins**
Teacher - IFSC (Instituto Federal de Santa Catarina)
Currently, the spectrum resource is sparse, requiring a system that optimizes use this. An option for radio broadcast is the use of digital radio techniques. These techniques are available standards DAB, DRM, IBOC and have extensive advantage over analog systems, for example, flexibility and audio quality. The choice of the most appropriate digital radio technique is a very important problem, and check of multilateral performances is necessary to countries considering the release of digital radio broadcasting service. In Brazil some tests with digital radio were performed, but no further definition of what standard to use. This paper aims establish some technical comparison of the leading digital radio standards available. Another goal is to present the movements of activities with digital radio in Brazil. Performing some direct comparisons between the patterns, it was observed that DRM is interesting in order to coverage and being open source, while IBOC (HD Radio) is a hybrid system, however proprietary. Index Terms: Broadcast, Digital Radio, Engineering, Telecommunications.

- **Photometric and Colorimetric Comparison of OLED, NANOSP, and LCD Television**
  Speaker: **Marcelo Knorich Zuffo**
  Professor Titular da Escola Politécnica / Universidade de São Paulo – USP
  The LCD – Liquid Crystal Display technology is currently the best known of flat screens TVs. However, two innovative and advanced technologies are emerging to the public: the OLED – Organic Lighting Emission Devices, and the NANOSP – Nano Spectrum, also known as Quantum Dot. The aim of this paper is to present a photometric and colorimetric comparison between LCD, OLED and NANOSP. Radiometric-spectrum measurements in TVs under test allow a direct comparison of their main characteristics and objectives parameters. Our results bring a detailed understanding of these new technologies performance and their outstanding qualities in the market. Index Terms: TV receivers, HDTV, Photometry.

- **High Dynamic Range Content in ISDB-Tb System**
  Speaker: **Diego Arturo Pajuelo**
  Engenheiro / UNICAMP
  Nowadays, the industry is discussing the different requirements for High Dynamic Range television systems. There is no global standard of HDR Content Broadcast yet, which opens countless opportunities for global consumer's electronics in the future. For this reason, we propose an efficient use for Broadcast with backwards compatibility considering to actual standards. Additionally, each processing stage within a broadcast environment is further discussed, considering its limitations. Further objective measures are presented, evaluating different HDR tests. Index Terms: Broadcasting; High Dynamic Range; ISDB-Tb; Video System.

- **Receivers Behavior in a ISDB-T's Single Frequency Network**
  Speaker: **Christian Fragoas Fernandez Rodrigues**
  Telecommunications projects engineer at the transmission, research and development division - Rede Globo
  Former television receivers were unable to demodulate signals under very adverse conditions. In order to mitigate some reception problems, the so-called multiple frequency networks were used for television broadcasting. The advance in broadcast technology to digital transmission, using Orthogonal Frequency Division Multiplexing, allows digital television broadcasting networks to employ a smaller number of frequency channels as compared to former analog networks. A common appealing case is the use of a single frequency channel for the whole digital broadcasting network, the so-called single frequency networks. These became an important requirement, as they allow the improvement of spectrum usage, since contiguous regions are covered using a smaller fraction of the spectrum as compared to the former existing broadcasting systems and considering the same quantity of broadcasting transmitters. The advances in digital television broadcasting and improvements in receivers mainly pushed this. Both allowed the increase in the receiver's capability to demodulate signals under adverse conditions. This work investigates some aspects of receiver's performance and behavior in single frequency networks. The tests encompass five digital television

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receptors. Using a laboratory setup inspired in the single frequency network's reception scenario, we present results of the performance of digital television commercial receivers. One assumes that signals from two transmitters arrive jointly in line-of-sight conditions at the receiver. Several settings in terms of power ratios between primary and secondary signals and their relative delays are evaluated. In comparison to data in previous works, one observes an improvement in the performance of receptors in terms of the required electric field strength for successful reception. The effect of the guard interval setup on the reception is also evaluated and reported. We also evaluate the loss in the reception margin, which is inherent to the deployment of single frequency networks. In addition, using a default reception model, we translate the power density values measured on laboratory to the minimal electrical field strength necessary for reception. The results show a general degradation in receptor's performance due to the SFN and we conclude that the specified minimum electric field strength needs a revision to accommodate these types of project. Index Terms: Digital Broadcasting, Receiver's Performance, Single Frequency Networks, Orthogonal Frequency Division Multiplexing.

- **We Measured and Have Expanded the Space for More Services in Digital Television**
  Speaker: **Raphael Oliveira Barbieri**
  Product Manager / EiTV
  Digital TV stations transmissions can be configured so that the useful bit rate can accommodate a variable amount of information. We observed that the ISDB-Tb (Integrated Services Digital Broadcasting – Terrestrial, version B) bit rate is not fully utilized by the broadcasters. Hence, services can be added beyond to the content of television without this being hindered. Index Terms: Bit rate, ISDB-Tb, Services, TV broadcasting.

- **News production by machines and ethics: possible implications**
  Speaker: **Lucas Vieira De Araújo**
  Jornalista e Professor Especialista em Mídias Digitais /Universidade Metodista de São Paulo (Umesp)
  This article seeks to question the production of news by machines in the light of journalistic ethics. Justified such study by the importance of the issue for journalism, as well as to broaden the debate on this issue in Brazil. The methodology was an exploratory research from interdisciplinary bibliography in order to carry out a theoretical discussion. Among the results, we envision is a certain incompatibility robots to exercise ethics, given its original limitations. Index Terms: Ethics, News, Machines, Journalism.

MARCELO KNÖRICH ZUFFO
Professor Titular da Escola Politécnica da Universidade de São Paulo (USP)
An Electrical Engineer from the Polytechnic School of the University of São Paulo (1989), with a Master's in Electrical Engineering (1993), a Doctorate in Electrical Engineering (1997), a lecturer specializing in Interactive Electronic Media and Titular Professor (2006) of the Department of Electronic Systems Engineering of the Polytechnic School of the University of São Paulo. He has been involved with the Integrable Systems Laboratory (LSI), coordinating research and development in the field of Interactive Electronic Media, with the focus on the following topics: interactive media engineering, digital healthcare, high-performance computing, virtual reality, computer graphics and display. In 2001, he developed the first total immersive virtual reality system in Brazil, called Digital Cave (Caverna Digital). Since 2011, he has been coordinating the Interdisciplinary Center in Interactive Technologies at the University of São Paulo (USP)

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LUIZ CARLOS DE MELO GURGEL
Executive Director / Regional Director (Northeast) - PROSET / SET
Electronic Engineer; Qualified Teacher of Physics; MBA in Business Management and in Project Management from the FGV; specialization course in Digital Broadcasting in Japan; Operations Director of DETELPE; Director of Engineering at TV Pernambuco; Communication Director of the State of Pernambuco Dept. of Transportation, Energy and Communications; projects analyst at the Regional Headquarters of the MINICOM; Executive Coordinator of SET Northeast; Executive Director of TV Jornal, in Recife; SET Regional Director (Northeast).

YUZO IANO
Editor-in-chief / SET INTERNATIONAL JOURNAL OF BROADCAST ENGINEERING (SET IJBE) & - Professor Titular - Head and Founder of the Laboratory of Visual Communications (LCV) / UNICAMP
Bachelor's at State University of Campinas/SP/Brazil-Unicamp in Electrical Engineering (1972), master's at Electrical Engineering from State University of Campinas (1974) and doctorate at Electrical Engineering from the same university (1986). He is currently full professor at Unicamp. Has experience in Electrical Engineering, focusing on Telecommunications, Electronics and Information Technology. He is working in the following subjects: digital transmission and processing of images/audio/video/data, hdtv, digital television, networks 4G/5G, middleware, transmission, canalization, broadcasting of television signals, pattern recognition, digital coding of signals, data transmission and storage, and smart/digital cities.

VITOR CHAVES DE OLIVEIRA
Engineering – Coach IT Group Inc. / UNISAL / DeVry Metrocamp / SET
Vitor is a Brazilian Professor, Consultant and Researcher. PhD student in Electrical Engineering (Mackenzie), Master (MSc) in Electrical Engineering (PUCC), Specialist (MBA) in Electrotechnical Engineering and Power Systems (UNISAL), has a Bachelor's (BSc) Degree in Computer Science (UNISAL) and is an Informatics Technician (SENAI). College Professor working in the areas of Electrical Engineering and Computing at the Salesian University Center of São Paulo (UNISAL) and at the Metropolitan Integrated College of Campinas (DeVry Metrocamp); Magazines Editor (in Broadcast Engineering) / Chair & Manager for the SET EXPO Technology Conference for the Brazilian Society of Television Engineering (SET); Member of Engineering – Infrastruture/Broadcast/Cloud/ERP/Web/Mobile for the 'Coach IT Group Inc.'. Is a book author in Cloud Computing area and has published dozens of articles in Scientific Journals and at National and International Conferences. His research interests are focused on Telecommunications: IP Networks, Radio Broadcasting (Digital TV), Electromagnetic Theory, Control Algorithms, Mathematical Systems Modeling, Virtualization and Energy Efficiency.

SÉRGIO BIMBI JUNIOR
Engineering - Masipack Inc / FATEC
Sérgio Bimbi Junior holds a Master's in Industrial Process Engineering (from IPT) and an undergraduate degree in Telecommunications Engineering from the FIEO University Center. He has currently accepted the challenge of integrating the Engineering and Product Development and Solutions team within the industry, which is among the leaders in solutions for industry at multinational company, Masipack where he is an Electronics Engineer. In addition, he is a University Professor São Paulo School of Technology (FATEC), where he is engaged in several fields of electrical engineering, such as: Electronics, Power Engineering and Computing. He has experience in Electrical Engineering, with the emphasis on Onboard Electronics and Telecommunications, developing hardware for numerical commands, industrial automation and VHDL programming. He has carried out research work at the UNIFIEO University Center, involving FPGAs that are currently used in various follow-on studies. His career has seen him create several industrial solutions like measurement systems, automatic weighbridges, PLC programming, control systems, weight checkers, digital filters for the measurement area, etc. He is engaged in research in the field of Software Defined Radio – SDR, using integrated circuits with partial dynamic reconfiguration. During his career he has been heavily involved with R&D designed to meet the requirements of a wide range of industrial parks, having filed and requested patents for products and processes in Brazil and overseas. He participates in national and international meetings and debates intended for Electronics Automation and Artificial Intelligence in industrial processes and dealing with signals so as to increase efficacy and efficiency.

RAMON MAYOR MARTINS
Teacher - IFSC (Instituto Federal de Santa Catarina)

Ramon Mayor Martins was born in Paraisópolis, Minas Gerais in 1982.M.Sc. in Telecommunications System by the Instituto Nacional de Telecomunicações, Specialist in Telecommunications Systems and Telecommunications Engineering. He worked as a researcher at the Inatel Competence Center with embedded and RF system. Currently holds the position of Professor at Telecommunications Engineering in the Instituto Federal de Santa Catarina. He has developed research in areas like: RF systems, antennas project, satellite communications and artificial intelligence.

DIEGO ARTURO PAJUELO
Engenheiro – UNICAMP
Diego Arturo Pajuelo formou-se em Engenharia Elétrica pela Universidade Peruana de Ciências Aplicadas (UPC), Lima, Peru, em 2012. Atualmente está fazendo Mestrado em Ciências e Telecomunicações na Universidade Estadual de Campinas (UNICAMP). Suas pesquisas têm ênfase em Codificação de Vídeo e Áudio, Processamento de Imagem, Comunicações via Satélite e Televisão Digital.

CHRISTIAN FRAGOAS FERNANDEZ RODRIGUES
Telecommunications projects engineer at the transmission, research and development division - Rede Globo
Brazilian, 26 years of age. His education background includes a Master's in Electronic Engineering from the State University of Rio de Janeiro (incomplete); an Undergraduate Degree in Electrical Engineering with the emphasis on Telecommunications, State University of Rio de Janeiro (2015) and an Undergraduate Degree in Systems Analysis and Development from the City College (2011). His professional background includes: Rede Globo (September-2015 to the present) as a telecommunications projects engineer at the transmission, research and development division. His activities include: Extending digital coverage in the State of Minas Gerais, Projects/Regularization of Microwave Links and Transmission testing for developing new technologies (UHDTV 4k/8k). Also at Rede Globo (September-2013 to August-2015) he was an Intern in the projects and installations area, engaging in: Development/enhancement of scripts involving the installation of microwave links (air space violation and channel interference studies); Regularization of microwave links; studying/designing Digital TV network coverage; assisting the engineers in partnership projects for developing new digital television technologies. He also worked at Brasil Telecom in the period from April 2012 to August 2013 as an Intern in the Release Management area, having been involved with: Maintenance of test and certification environment; maintenance of code version control systems; and the development auxiliary systems for the software quality area. He is also conversant in English.

RAPHAEL OLIVEIRA BARBIERI
Gerente de Produto – EiTV
Raphael Oliveira Barbieri é formado em Engenharia de Computação pela FEEC-UNICAMP (2007) e possui MBA em Gestão de Projetos pela IBE-FGV (2014). É membro do Módulo Técnico do Fórum SBTVD e Gerente de Produto da EiTV. Atualmente está fazendo Mestrado em Engenharia Elétrica na FEEC-UNICAMP. Suas pesquisas têm ênfase em TV Digital, ISDB-Tb e Engenharia de Broadcast.

LUCAS VIEIRA DE ARAÚJO
Journalist and Professor Specializing in Digital Media - Methodist University of São Paulo (Umesp)
Jornalista, professor e pesquisador da área de comunicação e inovação, graduou-se em Jornalismo e realizou mestrado em Literatura pela Universidade Estadual de Londrina (UEL) e cursou MBA em Marketing pela Universidade Católica de Brasília. Por 15 anos foi repórter, editor-apresentador e gerente regional de Jornalismo em afiliadas da Rede Globo, Rede Record e Rede Bandeirantes no Paraná e no Grupo RBS em São Paulo (SP). Além disso, atuou como

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professor e coordenou cursos de graduação e pós-graduação. Atualmente realiza doutorado em Comunicação pela Universidade Metodista de São Paulo com pesquisa inédita sobre o ecossistema de inovação em comunicação no Brasil. Ademais, realiza pesquisas relacionadas a big data, news robts, ética jornalística e jornalismo de dados.

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