

## **JTS 2010 Oslo**

DIGITAL CHALLENGES AND DIGITAL OPPORTUNITIES IN AUDIOVISUAL  
ARCHIVING

**Tuesday May 4**

### **Klingenberg Cinema**

**08: 00 Coffee**

**8:30**

#### **Nadja Wallaszkovits**

Phonogrammarchiv

Austrian Academy of Sciences, Vienna,

**Austria**

#### **Audio goes Video: Videographic Capturing of Audio Related Metadata with Analogue Magnetic Tapes of the Collection Oskar Sala**

Oskar Sala (1910-2002) was a German musician, scientist and composer, and a pioneer of electronic music. He played and further developed the trautonium, a predecessor to the synthesizer. By developing and modifying this instrument, Sala was able to create totally new sounds and effects and anticipated a lot of well established film sounds and musical expressions. He composed the scores for more than 300 films and created the effect soundtrack for Alfred Hitchcock's film "The Birds", receiving many awards for his works. After his death he left, amongst others, a collection of about 1200 analogue magnetic audio tapes which are stored in the archives of Deutsches Museum in Munich.

Oskar Sala fully exploited all the possibilities of the analogue tape technology, using impressive experimental approaches. His tapes have become artworks themselves, as they comprise a unique richness of very special and specific metadata: most of the tapes are cut up to 200 times per reel, and nearly each of the short separation tapes as well as the back side of the tapes itself is filled with manually written (more or less readable) notes. Such and many more surprises make an adequate safeguarding and digitization of the collection a unique undertaking. The collection is now being digitized, financed by KUR – Programme for the Conservation of Moveable Cultural Assets (Germany) and under the consultancy of the Phonogrammarchiv Vienna.

The paper outlines the various challenges of this project, starting with a general survey of the collection and the equipment used at the time of production. The various parameters and practical problems of the audio transfer are discussed, as well as the strategy of safeguarding the unique specific metadata by use of high definition video recording. Finally a database will merge the complete digitized works of Oskar Sala and will provide comprehensive access to the material for the first time.

**09:00**

#### **Christine M. Abrigo**

Associate Librarian

The University Library, De la Salle University, Manila.

**Philippines**

#### **AUDIO-VISUAL PRESERVATION: A PERPETUAL DILEMMA AMONG SELECTED PHILIPPINE ACADEMIC LIBRARIES**

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By Christine M. Abrigo and Vincent M. Abrigo

### **Abstract**

The paper looks into how three of the major academic libraries in the Philippines – the University Library of the University of the Philippines Diliman, the Rizal Library of the Ateneo de Manila University and the University Library of the De La Salle University Manila – in custody of audio-visual collections are coping up with the looming issue of media obsolescence. As these libraries/media centers face the daunting turn in media preservation brought about by technological advances, including digitization, the apparent dilemma seems to be the identification of the most appropriate media carrier that can withstand technological shifts, at least at the moment. The search for the suitable medium is rather what complicates the preservation of cultural heritage in the Philippines today, as intensified by the day-to-day existing material degradation factors that put the AV materials at risk. The audio-visual preservation issues and challenges being confronted by these libraries and the preservation strategies and opportunities that they undertake are the major focus of this paper. The paper offers a glimpse of the AV preservation situation in the Philippines as well.

Keywords: audio-visual preservation, media obsolescence, cultural heritage, libraries

**09:30**

### **Frederic Dumas**

Head of the Signature project  
INA, Institut national de l'audiovisuel,  
**France**

### **Monitoring the broadcast of archive content**

Authors : Thomas Drugeon, Jérôme Thièvre, Valentine Frey, Matteo Treleani

An archivist such as INA has two main aims: preserving the content in its holdings and developing the access to his content. As a side effect, in a digital world, providing an access to an asset means that one loses control on further distribution of the asset. Technically, once an archive copy has been provided or broadcast, it is indeed impossible to fully control how the content will be copied again and broadcast.

One may clearly still want to track how archives are distributed, for commercial or for analytical purposes. INA has developed the *ina-signature* technology in order to answer that concern for video content. Rather than fully controlling the distribution of content, this tool aims at automatically detecting when a video archive is broadcast. Further actions are taken depending on the context.

INA uses this tool in order to automatically track the broadcast and the distribution of its video programs. This is in operation now for two applications: monitoring the broadcast of INA archives on TV and controlling their distribution on internet sites such as Dailymotion. The system indeed provides INA with reports on television broadcasts of its archives, which are then compared with rights sales. It also prevents the distribution of its archives on user-generated-content internet sites according to per-content instructions.

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Contrary to DRM-based protection systems, this solution does not imply any packaging of the videos in a proprietary container. Contrary to watermarking-based systems (invisible marks), it allows tracking the archives without any necessary signal embedding into the video.

As an interesting feature for archivists, the system also allows going back in time when monitoring how archives were broadcast; in other words one may even track how archives were integrated in past broadcasts.

This presentation explains the principles of the in-a-signature system and how it has been put in operation.

10:00

### Johan Oomen

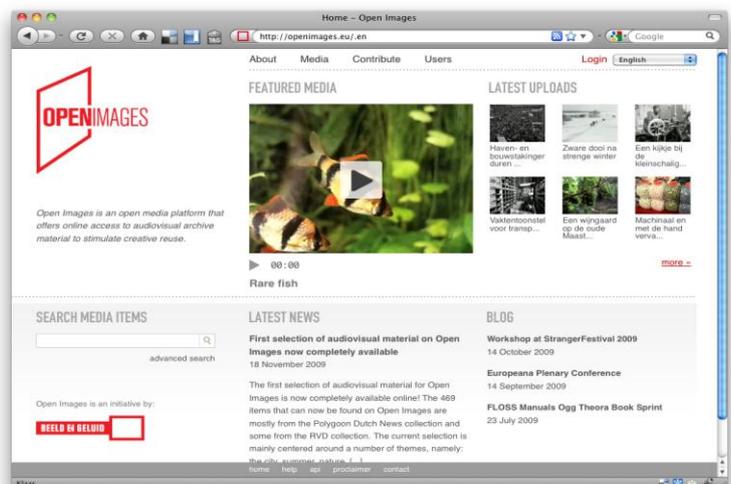
Johan Oomen and Maarten Brinkerink  
Netherlands Institute for Sound and Vision  
The Netherlands

### Open Images: Creative Commons distribution platform for video

Keywords: HTML-5, Creative Commons, Ogg Theora, MMbase, OAI-PMH

In September 2009, the Netherlands Institute for Sound and Vision launched Open Images (<http://www.openimages.eu/en>), an open media platform that offers access to a selection of archive material with the aim to stimulate creative reuse. Footage from audiovisual collections can be downloaded and remixed into new works. Users of Open Images also have the opportunity to add their own material to the platform and thus expand the collection. Access provision to the material on Open Images is based on the Creative Commons licensing model. The 'open' nature of Open Images is underscored by the use of open video formats (Ogg Theora), open standards (HTML5, OAI-PMH) and open software components.

The platform is based on the MMBase open source multi media publishing system. Furthermore, all software that is developed as a result from Open Images is released under an open source license. Besides remixing archive materials, Open Images offers the possibility of interlinking with other data sources. Within the project, dozens of CEPolygon<sup>1</sup> newsreels have been added to existing textual entries of the Dutch Wikipedia. For example, to the entry about 'Almere', where the textual description of the city's history is enriched with an audiovisual illustration about its first inhabitants.



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In cooperation with Wikimedia Netherlands it is now being investigated how Open Images, can contribute audiovisual content to Wikipedia on a more structural basis. As the API to the data is published, Sound and Vision hopes programmers will use the data in the creation of mashups. For instance, students of INHOLLAND University are currently working on a mashup of Open Images content with the OpenStreetMap, the free editable map of the world. Open Images offers access to over hundreds of items from the Sound and Vision archives. The collection will grow substantially over the coming years, as new items will be uploaded continuously. This year, also material from the Dutch Filmmuseum will be added. Also, Open Images is working with the EU funded project EUscreen ([www.euscreen.eu](http://www.euscreen.eu)) and will invite other broadcast archives to supply data. Non-professionals are also encouraged to create new programmes based on Open Images fragments and items from other online repositories of archive material.

Open Images has been developed as part of the Images for the Future project ([www.imagesforthefuture.org/](http://www.imagesforthefuture.org/)), which enables digitization and provision of audiovisual heritage on a large scale.

#### **10:30 Coffee**

**11:00**

**Chair:**

**Robert Heiber**

**Panelists:**

**Bernard Besserer, Robert Heiber, Henrik Lausen, Uli Ruedel**

#### **Scanning Technologies for Motion Picture Optical Sound Tracks**

The use of optical sound track negatives (OSTNs) as an audio source is counter intuitive to archival practice. The standard established by the archival community is that an optical sound track positive (OSTP or track print) is made from the OSTN in order to transfer the sound. However, since the beginning of motion picture sound, methods have been tried to transfer the audio directly from the OSTN in order to save time and money. But these early attempts produced unsatisfactory results. In the last 25 years OSTN transfer technologies have been improved to the point that they can successfully recover the sound providing a cost saving and time efficient alternative to the track printing process.

Today, there are compelling reasons to consider sound scanning technologies, which go beyond time and cost savings. The improvements that have been made in sound scanning technologies afford the archivist an opportunity to achieve superior quality as well as reduce the detrimental impact on the environment that traditional photo/chemical processes, such as track printing create.

*Scanning Technologies for Motion Picture Optical Sound Tracks* will present an overview of the methods that are commercially available to scan motion picture optical sound tracks as

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well as new research being done in this field. This review is not intended to promote any specific method, but to make archivists aware of these tools and the various quality improving features they offer.

For example, the ability for scanning technologies to simulate better sensitometry allows them to make adjustments to the OSTN during transfer or acquisition that would need to be carefully compensated for when making a track print. This is due to the fact that legacy OSTNs were created for the density characteristics of printing stocks no longer manufactured. Printing an OSTN at the incorrect density will yield a track with additional audible distortion. This results in a noisier sound track and more time consuming audio restoration.

### **Bernard Besserer**

Université de la Rochelle,  
France

### **Restoration of optical soundtracks in motion picture films by digital image processing**

*A. Hassaine, E. Decencière<sup>(1)</sup>, B. Besserer<sup>(2)</sup>, N. Ricordel<sup>(3)</sup>, C. Comte<sup>(4)</sup>*(1) Centre de Morphologie Mathématique, Ecole des Mines de Paris, 35 rue Saint-Honoré, - 77305 FONTAINEBLEAU cedex

(2) Université La Rochelle, Av. Michel Crépeau, - 17042 LA ROCHELLE cedex

(3) C.N.C Archives Françaises du Film, 7bis, rue Alexandre Turpault - 78390 BOIS D'ARCY

(4) EclairLab, 8-16 avenue de Lattre de Tassigny - 93806 EPINAY/SEINE cedex

The restoration of old motion picture films is an active research field. However, the restoration of the optical soundtrack has mainly been performed in the audio domain, in spite of the fact that it is recorded as a continuous image located between the images of the film and the sprocket holes. The restoration of the optical soundtrack directly at the image level has some advantages, particularly as the defects are visible, we do not therefore need to know their audio equivalent to be able to restore them. Moreover the optical representation of the soundtrack follows several geometrical properties that can be used for its restoration.

We present results from recent research, related to a project funded by the French ANR (Agence Nationale de la Recherche). This project has lasted from 2006 to 2009 and has included a large academic research section but also system prototyping and real-time implementation.

### **Robert Heiber**

Vice President Audio - Deluxe Digital Media  
Chace Audio by Deluxe  
USA

### **Overview of the Chace Optical Sound Processor –eXtended intelligence -2k Scanner**

The real-time transfer of optical sound track negatives (OSTNs) with the Chace Optical Sound Processor™ (COSP) has been a signature technology of Chace Audio since 1985.

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The newest generation of this technology, the Chace Optical Sound Processor – eXtended intelligence - 2k-scanner system (COSP-Xi2k™), offers advantages and opportunities not available in previous versions. Like all optical sound track scanning systems the COSPXi2k™ is environmentally friendly by eliminating the need for the costly natural resources used in the track printing process.

The COSP-Xi2k™ technology has evolved from a 256 pixel, single-line array scanner to a full 12-bit grayscale, and 2048 pixel imaging system. This affords a visual acuity of 1/20,000" per pixel on a 100 mil (1/10") soundtrack. The increase in scanning resolution coupled with improvements in DSP (Digital Signal Processing) has led to improved audio results.

The COSP-Xi2k™ operates at a native 96 kHz scan rate by taking advantage of the PCI express (PCIe) buss structure. The scanner's CCD 12-bit grayscale configuration allows for advanced DSP processing to correct deficiencies found in OSTNs, problems that often cannot be corrected even by making a positive print of track (track print).

The COSP-Xi2k™ is configured for the playback of 16mm, 17.5mm, and 35mm optical sound film in both variable area and variable density formats. Tracks up to 200 mils wide are also a standard accommodation. The sophistication of the operator's controls allows the engineer to optimize the playback of the sound track in real-time. Problems like cross modulation distortion and clash in variable area tracks, and missed densities and physical damage in variable density tracks are corrected in the digital domain during the transfer.

While the video output of the scanner is processed into an audio signal, a video image of the track is also provided to the operator. This permits efficient set-up for proper track placement and allows the engineer to examine, in microscopic detail, physical problems in the track like – scratches, cinch marks, embedded dirt, etc. Frame captures of these problems can be made and reviewed with clients and production staff to resolve problems.

### **Henrik D. Lausen**

Managing Director

Laser Interface Photonics

**Denmark**

### **SoundDirect, a Laser Soundtrack Scanner.**

A Laser Soundtrack Scanner, SoundDirect is presented, for reading of negative and positive optical soundtracks. The technology is based on novel photonic principles, that differ from other analog and digital readers. The mode of operation is based on front scanning negatives or positives with a laser beam in a novel optoelectronic design based on the wave properties of laser light. This design features enhanced edge detection on variable area (VA) soundtracks. It solves the basic problem of VA image spread distortion with an electronically adjustable CrossMod compensation, which the user may operate in real time. Negatives can thus be read and restored directly, without needing to make positive prints.

The groundnoise and clicks in the negatives are reduced significantly directly during pickup and unavoidable clicks and pops by splices and scratches are digitized into a high frequency domain suitable for subsequent noise reduction software. The system has oscilloscope viewer diagnostics and adjustability for difficulties like fine grain/low-contrast material. This is an important aspect of the technology which enhances the users knowledge about sound on film and provide for substantial workflow savings.

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Because of the immense complexity of historic film sound problems the system does not make digital processing obsolete but rather enhances its variability and effect.

The concept has been further developed into the next generation SoundDirect VD system which is now available and is being implemented with existing system users. This reader addresses the particular noise and exposure distortion problems of variable density negative and positive tracks.

### **13:00 Lunch Break**

**14:00**

#### **Jörg Houpert**

Technical Director

Cube-Tec International

Germany

#### **Supervision of the Analogue Signal Paths in Legacy Media Migration Processes using Digital Signal Processing**

The final transfer of physical carriers to file formats for preservation should be done without quality loss. Usually the quality level of the signal retrieval from the original carrier determines the overall signal quality of the preservation process. In a mass migration process the technical quality of the used playback devices and the carefulness utilized in the transfer process is hard to estimate by inspecting the resulting files. Particularly by using an external service provider spot checks and comparisons with in-house digitization will be a time consuming and still fragmentary approach to judge the quality of service.

Three methods will be presented, to close that analogue security gap.

Two of the methods will introduce redundancy to verify the analogue signal path.

- Single-ended error detection based on transfer error models
- Full automatic reference-based error analysis using calibration media
- Automatic signal verification using multiple ingests of the same physical media

The three methods will be compared and advantages, as well as limits of each method will be demonstrated by using results from real-world mass migration projects. The three methods can also be combined to complement each other.

The presented methods will enable a precise specification of the required signal transfer quality and will continuously document the technical quality of the used playback devices and analog to digital converter. The in-house quality management will benefit from this and the new parameter can become part of the description of the level of service.

A service provider will be able to provide certified parameter of the technical transfer quality, as an online service to his client. For this the parameter can be visualized in easy

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understandable graphics within an Internet browser window.

The presentation is focused on the supervision of audio signal paths. An outlook on corresponding technology for motion pictures will be provided.

**14:30**

**Chris Lacinak**

AudioVisual Preservation Solutions

New York, NY

U.S.A.

**Chris Lacinak**, AudioVisual Preservation Solutions & New York University Moving Image Archiving and Preservation Masters Program

**David Rice** of AudioVisual Preservation Solutions

**Richard Wright** of the BBC

### **Migration of Media-Based Born-Digital Audiovisual Content to Files**

This paper and presentation will examine preservation philosophies and strategies for migration of audiovisual collections that are both born-digital and tape or disc based. This media looks and acts like legacy analog media in many ways, but the underlying technology and implications to workflow and practices are very different. Approaching migration of these collections brings about the challenge of handling the process either as a traditional audiovisual capture process with a focus solely on the audiovisual signal, or as a data transfer process whereby packetized data is migrated. Chris Lacinak of AudioVisual Preservation Solutions will open this paper and presentation with an overview of these considerations and challenges.

David Rice of AudioVisual Preservation Solutions will then discuss his work in this area developing data-centric workflows and tools to support these efforts. These workflows and tools enable both high-efficiency and high-accuracy migration of born-digital, tape and disc based media. Of primary focus will be the recent release of a freely available open-source tool called DV Analyzer and workflows for migration of content stored on Digital Audio Tape (DAT).

Following this Richard Wright of the BBC will discuss how they have managed the transition from digital videotape formats to digital files. This portion of the paper and presentation will examine the different migration paths for various born-digital tape-based video formats including DV, Digital Betacam and Panasonic D3. This variance in approach raises challenging questions in translating preservation principles into technical practices that Richard will address.

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**15:00**

**Xavier Sené**

Section de conservation  
Département de l'audiovisuel  
Bibliothèque nationale de France  
**France**

### **Determining the composition of shellac discs: Challenge or fantasy?**

The mechanical discs (shellac and vinyl), considered to be “lasting”, are in reality unknown: nothing guarantees their long term preservation and some deterioration begins to be observed in the collections of the French National Library.

Identifying the materials which compose them will allow us:

- to identify the main causes of their degradation and to define the better conservation strategies which will guarantee their long-term safekeeping;
- to predict the “natural” lifespan of these carriers and to deduce the digitization priorities;
- to develop a safe cleaning procedure which will be done prior to their digitization.

The main difficulties are the size of the mechanical discs collections in the French National Library (650 000 discs) and the supposed disparity in the discs composition depending on countries, time, companies, etc.

The study presented here aimed at:

- finding in the companies archives (records, board meetings deliberations, etc.) which raw materials were used for discs manufacturing, in order to adapt chemical treatments to the found components;
- comparing these recipes with the “real” composition determined by laboratory analysis on original discs micro samples.

Our first research has been limited to a restricted testing group, so that we can define a working method. It will be extended to other countries, other periods and other companies in order to elaborate a logbook for preservation and possible digitization of endangered documents.

Our paper will describe mainly the first steps and conclusions of this project, around analysis of Pathé discs, 1906-1919 and Gramophone/Zonophone discs, 1897-1907.

**15:30**

**John W. McBride**

School of Engineering Sciences,  
University of Southampton,  
**UK**

**Lars Gaustad**

National Library of Norway.  
**Norway**

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#### **Audio recovery and identification of first Norwegian sound recording**

P.J. Boltryk, J.W. McBride, L Gaustad\*, Frode Weium\*\*

School of Engineering Sciences, University of Southampton, UK

\*National Library of Norway

\*\* The Norwegian Museum of Science and Technology

The first demonstration of sound recording in Norway was made on 5th February 1879 by an Edison tinfoil phonograph at the Tivoli in Kristiania, where it is documented that music salesman Peder Larsen Dieseth sang a liturgical psalm. In 1934, Dieseth donated a tinfoil recording mounted on a sheet of paper in a photo frame to The Norwegian Museum of Science and Technology, where it has hung as a wall exhibit in the subsequent years. The accompanying transcript written by Dieseth identifies the artefact as the original tinfoil recording from this first demonstration, but it has never been able to be played due to its fragility and the fact that it was glued to the paper mount. The tinfoil artefact is significantly smaller than a tinfoil artefact owned by the British Library, perhaps suggesting that either the recording drum diameter was smaller for the Norwegian recording, or that a portion of the tinfoil is missing. It has a few tears along the grooves, obliterating the audio content in these regions, and a few crumpled regions where the tinfoil was pushed onto the glue, again probably affecting the original audio content.

This paper documents a project co-funded by The Norwegian Museum of Science and Technology and the National Library of Norway to extract the audio from this unique artefact using a non-contact optical method developed during a recent project for the preservation and recovery of sound from early recorded sounds media, conducted at the School of Engineering Sciences, University of Southampton, UK. The whole artefact's surface topology is mapped to high precision using optical sensors, and the audio recovered by applying signal and image processing methods to the measured data. The measurement process for this artefact took three weeks of continuous scanning. Initial attempts at audio recovery from the surface data using existing processing techniques were largely disappointing, leading to the development of a more sophisticated methodology based on feature tracking through the groove. Out of six short tracks found on the foil, four contained significant audio portions featuring both music and speech, the remaining two tracks were both short and contained negligible content.

The extracted audio, probably the first time it has been reproduced since the original recording date, was not the expected psalm singing as documented in the contemporary sources, but a mixture of shorter extracts. Features of the grooves and the extracted audio may confirm that the foil is a small portion of the recorded foil, and that portions of the remaining foil could have been distributed to other guests of the event, consistent with contemporary practice.

**16:00 END**