EBU
OPERATING EUROVISION AND EURORADIO

MDN WORKSHOP 2019

TUESDAY 11 JUNE

08:30 – 09:00	*Registration & tea or coffee*

09:00 – 09:15

WORKSHOP, HANDS-ON DEMONSTRATIONS SETUP AND GOALS

Tormod Vaervagen – NRK and Kim Viljanen – YLE

09:15 – 10:00

THE METADATA MACHINE AT YLE

Is the time right for automatic metadata extraction in production? This is one of the questions the Finnish broadcasting company Yle has been working on in the recent years. The vision of the Metadata machine is to have a system that automatically extracts metadata from all audiovisual material Yle ingests, produces, publishes and archives – such as TV and radio programs, raw material, live and recorded content. In this presentation we report our findings from the Metadata machine proof of concept project that Yle conducted during spring 2019 together with Graymeta Inc. We present the most valuable business cases we identified during the project and demonstrate the practical implementation of the Metadata machine.
Kim Viljanen & Tapio Korpela, YLE & Matt Eaton, Graymeta Inc.

10:00 – 10:45	*Demonstrations, tea, coffee*

10:45 – 11:30

USING TV METADATA TO OPTIMISE THE RE-PURPOSING AND RE-PUBLICATION OF TV CONTENT ACROSS ONLINE CHANNELS

A presentation of the technical implementation of our Trans Vector Platform (TVP) with a Metadata Repository aggregating different forms of TV content metadata and enabling data-driven services for prediction, repurposing and recommendation of TV Content. Associated hands-on demonstration.
Lyndon Nixon, MODUL Technology GmbH

11:30 – 12:15

WHY DATA ISN'T ENOUGH

As enterprise architects we were given the task of providing an overview on the use of data in our company, and the way we should move ahead with data. When we started out this task, we quickly noticed that it is impossible to be "just" a data architect, and inspired by the Archimate modelling language we are gradually convincing the rest of the organisation of the dual relationship between behaviour and data. We would like to give some more insight into the deliverables we have been using to achieve this and to show in which ways these deliverables can be used in everyday and not so everyday problems of our colleagues. Associated hands-on demonstration.
Viviane Festjens, Joris Van Denstorme, Enterprise Architects at VRT

12:15 – 13:00

ARTIFICIAL INTELLIGENCE IN RTS ARCHIVES

RTS Radio Télévision Suisse will make a demonstration of the tools (AI - machine learning based) it has developed and put into production in recent months. It will also present concrete examples where these tools have proven to be very useful and powerful in solving complex or very time-consuming issues. This presentation will be also the occasion to present examples of possible international collaboration and cooperation on Machine Learning related topics amongst interested broadcasters' archives. Associated hands-on demonstration.
Sébastien Ducret and Léonard Bouchet, RTS Radio Télévision Suisse

13:00 – 14:00	*Lunch*

14:00 – 14:45

INFORMATION ARRANGEMENT AND SMART STACKING

As organizations struggle with intelligently layering their existing technological and informational eco-system, I would like to discuss with the EBU Metadata Developers Network how we adopted the EBU standard plus others like IETF BCP 47 for the needs of HBO. Part of our approach included sharing a glossary of terms used in the organization which set the stage for transparency and to disambiguate terms. I want to discuss how information architecture involves arranging information and content which leads to better management of the metadata and creation of metadata schemas. The presentation will discuss the process of stacking the domains of semantic tools together (IA, taxonomies and ontologies) with data science and data governance, discuss the strengths and weaknesses of each, what kinds of problems each is the best match for and how one can support the

	other. I will also discuss, on behalf of my colleagues, how the IETF standard has led to the Language Metadata Table standard committee with MESA. **Dalia R. Levine, Ontologist, HBO**
14:45 – 15:30	HOW TO REFER MCMA GITHUB CODE FOR DEVELOPING YOUR OWN MCMA-BASED SYSTEM NHK STRL has been developing a certain trial tool named "MediaNote" for media people based on MCMA activity that can be obtained from MCMA github. This presentation will introduce details of the code on the github and give some ideas how to refer the code to develop your own media system. Then you can also grasp which direction the MCMA group is going to. Associated hands-on demonstrations. **Masanori SANO, NHK**
15:30 – 16:15	*Demonstrations, tea, coffee*
16:15 – 17:00	EXPLOITING YOUR DATA FOR AI: A LONG ROAD *This presentation will focus on the challenges related to the exploitation of metadata for AI tools.* **Alberto Messina, RAI**
17:00 – 17:45	EBUCORE MASTER METADATA PROJECT FOR SERIAL DRAMA PRODUCTIONS *We present the first results from a metadata-rich MAM system project setup for a recently started daily drama series. Commissioned by France Télévisions, Limecraft and Setkeeper have constructed a joint solution for extensive metadata tracking throughout the production workflow, from pre-production to locked edit. We carefully keep track of each asset for each scene in the scenario, and we chain all metadata together to enable new applications and efficiencies in the production process. This is done using EBUCore 1.8 metadata to describe, for each used element which scene is applicably, which shot was being used, which props are present, etc. This information is available for downstream departments at France Télévisions to take advantage of this reference metadata, for example for commercial or advertisement purposes (we know when characters that wear a specific piece of product placed clothing is present in the current scene), or to help distribution systems in offering better viewer experiences.* **Simon Debacq, Limecraft**

WEDNESDAY 12 JUNE

09:00 – 09:45	A NOVEL INFORMATION MODEL FOR MULTIPLE DRONE - BASED PRODUCTION *This presentation will describe an information model and related tools for the planning and execution of automated multiple drone productions.* **Alberto Messina, Maurizio Montagnuolo – RAI**
9:45 – 10:30	AUTOMATED METADATA AGGREGATION AND ENRICHMENT *Piksel shares insight into how it is using the power of AI and machine learning to simplify the media supply chain through the automatic cleaning, enrichment and consolidation of content metadata. Piksel believes that artificial intelligence and machine learning can play a significant role in reducing those costs and removing the burden of manual intervention from editorial teams.* **Cayetano Delgado – Piksel**
10:30 – 11:15	*Demonstrations, tea, coffee*
11:15 – 12:00	VALUE DRIVEN INTEGRATION WITH SMART DATA PLATFORMS *Data has value. But we still fail to preserve or even increase this value along our value chain. We struggle with bad APIs, silo architectures, countless interfaces, a plethora of data formats, unmanageable complexity in integration, etc. All of that leading to high costs, slow time to market for new services and rigidity instead of agility. Smart Data Platforms is an integration pattern to strike back. It frees data from their silos, gives ownership back to your enterprise and avoids vendor lock-in. It supports rapid life cycle replacements of applications, is cloud ready and lets you integrate ML & AI services easily.* **Jürgen Grupp, SRG SSR**

12.00 – 12:45	**EXPERIENCES FROM THE DEVELOPMENT OF THE TV 2 SUMO RECOMMENDATION ENGINE**
	We will describe ongoing initiatives at TV2 for transitioning Sumo into a personalized streaming service. The talk will focus on (1) setting up a new microservice architecture to facilitate a personalized application, and (2) the machine learning algorithms we apply to deliver user-tailored movie and series recommendations.
	Arne Klein, Lead Data Scientist, TV2
	Lars Skjærven, Senior Data Scientist, TV2
12:45 – 13:45	*Lunch seated*
13:45 – 14:30	**CONTENT ANALYSIS AND AI TOOLS FOR MEDIA VERIFICATION AND PRODUCTION, AND PROGRAM ANALYSIS**
	Audio analysis for verification, production, and program analysis purposes
	The presentation will be about two lesser-known kinds of audio analysis which can be used for content verification, production, and program analysis:
	(1) audio forensics tools, which are to be integrated into the content verification platform TrulyMedia (developed by Deutsche Welle and ATC), but which can also be used for quality control purposes
	(2) audio partial matching and audio phylogeny analysis, which can not only be used for rights tracking and metadata propagation within and among production archives, but also for deriving statistical information from radio streams
	Patrick Aichroth and Hanna Lukashevich, Fraunhofer IDMT
14:30 – 15:15	**THE FUTURE METADATA ECOSYSTEM FOR BROADCASTERS IN TIMES OF CHANGING DISTRIBUTION STRATEGIES OF YOUR CONTENT**
	The presentation will address the flowing topics:
	- Title first ingest workflow for pre-production / post-production
	- Having multiple digital archives and no consistency in metadata challenges
	- What could be the process to enrich your catalogue (both historical archives and future ingest)
	- What kind of metadata enrichment are critical to have, which are nice to have
	- What's the impact off metadata on your linear and on demand workflow
	- How metadata can be best normalized against local and global distribution platforms
	- Where come content metadata and viewing statistics together
	- Metadata and AI developments that can further support broadcasters
	Gijs Davelaar, Nielsen
15:15 – 16:00	*Demonstrations, tea, coffee*
16:00 – 16:45	**SUBTIL PROJECT: AN OPEN PLATFORM TO RUN MICRO-SERVICES WITH AI**
	The French funded "SubTil project" has allowed the development of an open micro-services platform to run various processes. Gentle and robust workflows have been developed and tested on a high scale. The presentation will focus on those using AI to automatically enhance the quality of subtitles.
	Matthieu Parmentier – francetélévisions
16:45 – 17:30	**MODELING AND USING THE H2020 MEMAD KNOWLEDGE GRAPH**
	In the context of the European research project MeMAD (Methods for Managing Audiovisual Data), we face the challenge of modeling semantically audiovisual legacy metadata and results of automatic analysis from multiple partners and in an interoperable manner.
	In this talk, we will present an implementation of the EBU-CCDM/EBU Core data model for representing production and broadcasting information of TV and Radio programs provided by two partners, namely INA in France and Yle in Finland. The so-called resulting MeMAD knowledge graph provides metadata for more than 60K hours of audiovisual content, spanning multiple channels, audiovisual genres, themes and languages. We will give a quantitative overview of the data in terms of size and scope, its original format as well as the working RDF model into which all data has been converted. We will present several controlled vocabularies and alignments attempts to enrich the data. We will describe how results of automatic analysis algorithms (e.g. face recognition, speaker diarization, named entity recognition and disambiguation, automatic speech recognition, etc.) can also be materialized and queried in this knowledge graph. Finally, we will show how this knowledge

graph can be accessed, using either SPARQL as an API or via a dedicated REST-based API automatically generated.
Ismail Harrando, EURECOM

THURSDAY 13 JUNE

09:00 – 09:45	### EVALUATING AI SERVICES

This presentation will describe RAI's dashboard for AI services evaluation.
Maurizio Montagnuolo - RAI

9:45 – 10:30	### SEMANTIC NETWORKED METADATA, REGISTERS AND KNOWLEDGE BASES

As well known, the UNESCO is registering things of outstanding universal value on 'World Heritage Lists': they cover namely natural landscapes, monuments, immaterial cultural manifestations. Further, the UNESCO is also conducting a programme called "Memory of the World" covering recommendation for the identification, the selection, the protection, the representation and the access of Documentary Heritage [collection of textual, ideographic, audio, audiovisual … documents]. The programme also includes a Register of Documentary Heritage of outstanding universal value. In 2006, UNESCO and Titan have collaborated in the Memories project for defining a general conceptual model fitting to the needs of registering and accessing to the World and Documentary Heritages and to their representations. The research has been pursued and validated by the IASA [International Association of Sound and Audiovisual assets]. The MDM presentation will present the complexity of the challenge (f.e. the registration of one Documentary Heritage composed of collections of documents standing at many places); the construction of the temporal, systemic, historical and cultural interoperability's; the key semantic concepts of the adopted solution [the AXIS-Conceptual Semantic Reference Model]; the pilot project called AXIS-OK (for Organizing Knowledge). In 2015, the EBU, the IASA and TITAN have unsuccessfully tried to collaborate with the UNESCO's PERSIST project to cover the Access segment. Now, that collaboration appears to be more than welcome. 'Outstanding Things' should be known, accessed and represented in outstanding and interoperable manners.
Guy Marechal, ASBL-Titan

10:30 – 11:15	*Demonstrations, tea, coffee*

11:15-12:00	### BMF – METADATA EXCHANGE FORMAT OF THE GERMAN PUBLIC BROADCASTERS

BMF stands for Broadcast Metadata Exchange Format and is a manufacturer independent format developed by IRT in close cooperation with the German public broadcasters to meet their requirements. It enables a continuous and standardized exchange of metadata in the domains of radio, television and online and covers information from many different areas such as planning, production, distribution and archiving. As a lingua franca in metadata exchange BMF facilitates the reuse of metadata and increases the interoperability between IT-systems as well as different application scenarios. Today BMF (or better its submodels) are widely used among ARD and ZDF in different areas. Prominent examples are the ARD Media File Transfer 2.0 (MFT 2.0) which deals with the contribution of mainly video files and the associated metadata between broadcasters and WeConnect, a concept for audio file transfer and line scheduling for real-time audio contributions. WeConnect exchanges all relevant metadata from the first idea of a story to the finished post with original sounds, pictures or videos.
Madeleine Keltsch, IRT

12:00 – 13:00	*Lunch*

13:00-13:45	### FULLY INTEGRATED SPEECH-TO-TEXT AT SRF

The Speech-to-text solution at SRF is based on an on-prem VM provided by Speechmatics which offers the option to add curated word lists to the machine learning process. Producers get their audios and videos processed in three to four times faster than real-time and with a WER up to 5 %. Especially for radio journalists the solution comes with a full integration into the DigaSystem audio editing suite. For non-radio user a web editor, based on a framework developed by the BBC, was programmed to give easy access to the transcripts including the option to correct the text without having to jump from one application to the other.
Christian Vogg & Damian Murezzan – SRF

13:45-14:30	UPDATES ON THE SUBTITLING AND MONITORING PLATFORM AT DW
	An update on recent developments at DW, a leader in subtitling for international multi-lingual services.
	Peggy van der Kreeft, Deutsche Welle
14:30-15:15	DETECTING COLOR BARS, END CREDITS, AND WOMEN BEARING SHOULDERS USING MACHINE LEARNING TRAINED ON A CUSTOMER'S OWN DATA
	Aaron Edell, senior director of business development and ecosystem
15:15-16:00	SUM-UP AND TAKE-AWAYS
	Tormod Vaervagen – NRK and Kim Viljanen – YLE

Demonstrations

1	TRANS VECTOR PLATFORM (TVP) DASHBOARDS FOR ANALYTICS, RE-PURPOSING AND RE-PUBLICATION OF TV
	We will show the prototypes of our scenarios highlighting how we visualise predictive Analytics for TV Content publication on different channels and use These Analytics to guide repurposing and recommendation functionalities of TVP tools for broadcasters.
	Lyndon Nixon (MODUL) and Miggi Zwicklbauer (Rundfunk Berlin Brandenburg)
2	WHY DATA ISN'T ENOUGH - DATA AND BEHAVIOUR IN ACTION
	The deliverables in our presentation are not just "pretty pictures", we will show them in action! For this purpose we use a modelling tool, which is essential in maintaining the different views on our data and behaviour. Using this tool we will be showing how we have linked data and behaviour, and there will also be the opportunity to go into greater detail on one or more of the deliverables we touched upon during the presentation (part one).
	Viviane Festjens, Joris Van Denstorme, Enterprise Architects at VRT
3	RTS.AI TOOLS
	We'll present the tools (including the source code) used to do facial recognition with verified public personalities, audio speaker identification with verified public profiles, visual search with people, scenes or building recognition, custom classifiers built directly without technical skills, gender identification, and more!
	Sébastien Ducret, Pietro Rezzonico, Léonard Bouchet at RTS
4	THE FIRST TRIAL TOOL MEDIANOTE
	The MediaNote is a kind of MCMA-based MAM system which allows us to manipulate multimedia contents with various kinds of services such as metadata extraction by video, audio, text analyses, and conversion/generation of media data.
	Masanori SANO, NHK
5	AUTOMATED METADATA AGGREGATION AND ENRICHMENT
	Piksel shares insight into how it is using the power of AI and machine learning to simplify the media supply chain through the automatic cleaning, enrichment and consolidation of content metadata.
	Kristan Bullett, Albert-Jan Tebbe at Piksel
6	THE METADATA MACHINE AT YLE
	We demonstrate the practical implementation of the Yle Metadata machine via specific business cases. The system is based on Graymeta Curio.
	Kim Viljanen, Yle Tapio Korpela, Yle
	Matt Eaton, Graymeta Inc
7	CONTENT ANALYSIS AND AI TOOLS
	Demos will include various automatic metadata extraction and dataset analysis tools, and how they can be tested via a respective API

Patrick Aichroth and Hanna Lukashevich, Fraunhofer IDMT

8	FIRST PROTOTYPE IMPLEMENTATION FOR THE EU H2020 MEMAD PROJECT, BASED ON LIMECRAFT FLOW

First prototype of the MeMAD production system with integrations of various ASR and detection tools.
Simon Debacq, Limecraft

9	ACCESSING THE H2020 MEMAD KNOWLEDGE GRAPH

In this demo, we will demonstrate how to query the MeMAD knowledge and how to make use of an automatically generated API on top of the graph.
Ismail Harrando, EURECOM

10	EXPLORING TEXT ANALYSIS OPPORTUNITIES AT VRT

In this demonstration, we will show the results of a proof of concept we did with two different vendors exploring the possibilities of an off the shelf NER and categorization system in comparison to a customized one.
Marieke Lycke, VRT

11	SPEECHMATIX AND TRANSCRIPT WEB EDITOR

The Speech-to-text solution at SRF is based on an on-prem VM provided by Speechmatics which offers the option to add curated word lists to the machine learning process.
Christian Vogg – SRF

12	ANYONE CAN TRAIN MACHINE LEARNING MODELS WITH THEIR VIDEO USING THESE TOOLS

We'll walk attendees through how to build their own machine learning models using their real broadcast data, from recognizing people to tracking logos, to automatically marking video on a timeline. No data science degree required! And if you have your own model already, we'll show you how to onboard it onto aiWare to share it with world without having to solve for scale, file management, metadata management or anything else.
Aaron Edell, Senior Director of Business Development and Ecosystem
Mat Ryer, principal Enginer