

# DataTV 2019: 1<sup>st</sup> International Workshop on Data-driven Personalisation of Television

Jeremy Foss

DMT Lab, Birmingham City University, Birmingham, UK, jeremy.foss@bcu.ac.uk

Lyndon J.B. Nixon

MODUL Technology GmbH, Vienna, Austria, nixon@modultech.eu

Ben Shirley

University of Salford, Manchester, UK, b.g.shirley@salford.ac.uk

Basil Philipp

Genistat AG, Zürich, Switzerland, basil.philipp@genistat.ch

Benedita Malheiro

Porto Polytechnic, Porto, Portugal, mbm@isep.ipp.pt

Vasileios Mezaris

CERTH-ITI, Thessaloniki, Greece, bmezaris@iti.gr

Sara Kepplinger

Fraunhofer IDMT, Ilmenau, Germany, sara.kepplinger@idmt.fraunhofer.de

Alexandre Ulisses

MOG Technologies, Porto, Portugal, alexandre.ulisses@mog-technologies.com

## ABSTRACT

The first international workshop on Data-driven Personalisation of Television aims to highlight the significantly growing importance of data in the support of new television content consumption experiences. This includes automatic video summarization, dynamic insertion of content into media streams and object based media broadcasting, to serve the recommendation of TV content and personalization in media delivery. The workshop is foreseen to have two keynote talks alongside several paper presentations and several poster/demo participations.

## CCS CONCEPTS

- Information systems~Data analytics
- Information systems~Multimedia content creation
- Applied computing~Publishing
- Applied computing~Service-oriented architectures

## KEYWORDS

Data extraction and modelling, media value chain, media personalization, personalized TV, TV recommendations, video summarization, object based media

## 1 Workshop Aim and Topics

The aim of the DataTV 2019 workshop will be to address the increasing importance and relevance of richly granular and semantically expressive data about TV content in the media value chain. Such data needs extraction, modelling and management before it can be meaningfully re-used in new, innovative services for TV content such as:

- Content Summarization (e.g. to provide highlights of a program according to a specific user, theme or channel)

Copyright © 2019 for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

- Recommendation and Scheduling across Content Publication Channels (Broadcast, Streaming, Social Networks)
- In Stream Personalisation of Content (both spatial and temporal modification of text, audio or video elements)

Topics for the workshop therefore included:

- Curation of TV data throughout the media value chain, e.g. use of the MPEG Value Chain Ontology
- Matching of TV data with user profiles for recommendation or personalisation (respecting data privacy and security)
- Tools and services for the composition of personalised TV, including object based media, making use of TV content data (e.g. creation of video summaries or alternative content versions, recommendation of auxiliary assets for delivery alongside TV content, dynamic insertion or modification of media in streams).

The workshop will reflect in its accepted papers, posters and demos the latest research and development in all areas of data creation and management for TV content and aims to support the growth of a community of researchers and practitioners interested in data value for personalised TV.

## **2 Keynotes: Object Based Media and Trans Vector Platform**

Two keynotes are planned to highlight two major threads of R&D into data-driven personalized TV.

Our first keynote speaker, Matthew Brooks of BBC R&D, reports on latest developments in object based media broadcasting.

StoryFormer is a cloud-based tool for creating responsive stories, built by BBC Research & Development. Responsive storytelling uses an object-based media approach that allows the contents of a programme to change according to the requirements of each viewer. StoryFormer aims to enable anyone with an idea for a responsive story to be able to create it quickly and easily, without the need for coding. In this session, you'll learn about the principles behind StoryFormer, and the potential it has to bring meaningful interactivity and personalisation to media experiences.

Our second keynote speaker, Lyndon Nixon of MODUL Technology, reports on the latest outcomes of the ReTV project to provide new tools for personalized and recommended TV.

The ReTV project is building a platform that aggregates data about TV programming in order to give functionality to media organizations that optimises the reach of their future content publications. In this keynote, we briefly consider the potential for future TV when we can offer dynamic adaptation of media streams to insert content personalized to the viewer, automatic recommendation of the most relevant programming in broadcaster archives or schedules as well as video summarization emphasizing the topics of most interest to the audience.

## **3 Discussion and workshop outcomes**

The workshop is outward looking and provides feedback to stakeholders in the industry (*viz.* operators, broadcasters, manufacturers) and also to end users. The workshop's objective is to become a focus for the broadcast personalization services of the near future, in terms of development and deployment. To enable this, the workshop will close with round table discussions on salient issues and disseminate findings to relevant bodies. This includes:

- issues of commercialization of software or services for data driven TV personalization, in order to move from reliance on R&D funding to self-funding via licensing and sales;

- media value chain and asset management in broadcasters' future IT systems, including media component contracts (e.g. smart contracts) and security of transactions, for example on blockchain platforms;
- items of best practice; standards; data management, ethics, user privacy; user interfaces and practices for production staff; user interfaces for viewers for service navigation; overall user experience (UX).

While this workshop is the first of its kind, it does not exist in isolation. A series of workshops on Future Television were held at the EuroITV conference (the forerunner to TVX) in 2010-2013, considering how the TV experience could be integrated with the Semantic Web, social networks, interactive media and services, and multiscreen applications. In all these cases, the role of data in informing software to make autonomous choices has been present and significant (e.g. the recommendation or selection of TV or Web content, its adaptation to device and user, personalization of the delivered content to the current context and user choices). The emergence of this topic of data-driven TV can be tied to two developments of this decade: R&D investment into exploring and developing data-driven TV solutions (also by the EU in projects such as NoTube (notube.tv, 2009-2012), LinkedTV (linkedtv.eu, 2011-2015) and ReTV (retv-project.eu, 2018-2020)) in parallel to the TV industry observing the data-driven solutions being delivered in other domains.

A similar workshop to DataTV was held at the TVX2017 conference – IPP4B (In-Programme Personalisation for Broadcast). At that workshop, issues raised included:

- selection and sequencing of programme sections which are dynamically adapted at time of playout
- the requirement to allow production personnel to focus on creation potential and the technologies supporting storytelling.
- the wide gulf between the technology capabilities identified in the workshop and what the creatives see as the potential of personalisation.
- the need to facilitate tools and capabilities to allow experimentation, including non-professional producers, including interaction with social networks
- metadata, workflow and production tools and associated technologies for media object compositing
- data collection remains an increasingly hot topic: user profiling issues, including “cold start” profiles (for new users without a profile history) and group profiling
- network technologies for delivering personalised content via adaptive bit rate streaming and cloud platforms.
- neural networks and AI for scene assessment and placement of content for personalization.

It was suggested that milestones are planned as a development towards demonstrators, i.e., boot-strap activities which demonstrate personalisation. It was also noted that real world data sets are required from initial activities to provide meaningful further studies in personalised media performance.

DataTV2019 will facilitate a new opportunity two years on to pick up and continue the discussions around these issues, chart progress, identify remaining gaps and take action. The ultimate aim is to communicate the state of the art in data-driven TV personalisation to relevant bodies in the media industry as well as drive further R&D in the remaining technology gaps, so that the necessary data specifications and standards are established alongside the necessary software and services using that data.

## **ACKNOWLEDGMENTS**

This workshop is co-funded by the EU Horizon 2020 research and innovation programme under grant agreement H2020-780656 ReTV.