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Data Standards Subcommittee

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Video Metadata Extraction in Digital Advertising

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Document Types and Tags

Document Type: Operational Practice

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☐ Test or Measurement

☐ Checklist

☐ Facility

☐ Architecture or Framework

☐ Metric

☐ Access Network

☒ Procedure, Process or Method

☒ Cloud

☐ Customer Premises

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1. Introduction

1.1. Executive Summary

Video is a ubiquitous medium. From TV and movies to social media and mobile platforms, its applications are numerous in the entertainment sector. The ability to ‘describe’ what’s happening in a video, without human intervention is the eventual goal of an AI/ML engine. The usual definition of Metadata is ‘data about data’. However, in the context of machine learning, Metadata are the ‘content descriptors’ of video/audio/textual data elements extracted from a video. Video metadata extraction is the process of auto-identifying video content.

An emerging trend is the application of AI technology for TV advertising. In this Best Practices Guide, we discuss the unique challenges in applying machine learning to carrier-class video advertising. To illustrate the point, the discussion is focused on a specific use case that is common to all ad supported TV services.

The selected use case is Ad Ingest Quality Control (QC). TV commercials are subjected to various rules and regulations. For example, ads containing specific content (e.g. Alcohol, firearms) are barred from airing during certain TV programs. Identifying these categories might pose a challenge to a machine learning tool, as off-the-shelf products are more oriented towards facial recognition. That is to be expected perhaps, as the video ML products were primarily intended for surveillance and sports applications. However, by judiciously combining metadata from multiple data streams, ML based analysis can be enhanced.

1.2. Scope

This best practices guide consists of two parts. The solution description section contains recommendations based on AI/ML WG member experiences and the lessons learned. The requirements section defines features a machine learning tool would need to perform for specified tasks.

1.3. Benefits

Machine learning based video analysis is a burgeoning field. As the technology matures, its applications in broadband industry will be far and wide. Network operators and service providers will find the guidelines useful in solution development. Vendor partners who are developing carrier-class machine learning solutions might embody these in product specifications.

1.4. Intended Audience

The intended audience are the machine learning practitioners in cable-telecom space.

1.5. Areas for Further Investigation or to be Added in Future Versions

While digital advertising is the focus of the current document, the methodologies are applicable to general video analysis as well. As the technology matures, guidelines to perform semantically rich contextual analysis would be fruitful.

Emerging paradigms, such as Interpretable and Explainable Artificial Intelligence (XAI), challenge the ‘black box’ model of deep learning. The extracted video metadata would need to conform with the results of such analyses.

2. Normative References

The following documents contain provisions which, through reference in this text, constitute provisions of this document. The editions indicated were valid at the time of subcommittee approval. All documents are subject to revision and, while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

No normative references are applicable.

2.2. Standards from Other Organizations

No normative references are applicable.

2.3. Other Published Materials

No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document.

3.1. SCTE References

No informative references are applicable.

3.2. Standards from Other Organizations

No informative references are applicable.

3.3. Other Published Materials

[1] FCC Guidelines for Ads - <https://www.fcc.gov/consumers/guides/complaints-about-broadcast-advertising>

[2] FTC Guidelines for Ads - <https://www.ftc.gov/tips-advice/business-center/guidance/ftcs-endorsement-guides-what-people-are-asking>

[3] FEC Guidelines for Ads - <https://www.fec.gov/help-candidates-and-committees/making-disbursements/advertising/>

[4] FDA Guidelines for Ads - <https://www.fda.gov/media/82590/download>

[5] ESPN Advertising Guidelines - http://www.espn.com/adspecs/guidelines/en/ESPN_AdStandardsGuidelines.pdf

[6] MIT AI Lab research - <http://moments.csail.mit.edu/explore.html>