EVALUATION OF VIDEO IMAGE CONTENT EXTRACTION AND INFORMATION RETRIEVAL USING ONTOLOGY

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ABSTRACT

Video data consist of raw data and heavy low-level feature content. Only through deep understanding of the video content retrieval rate will be high. In this paper, the ontology-based video content analysis and extraction methodology were discussed. Initially the work carried out with respect to multimedia data was discussed. With respect to video event, capturing the elegant content is the cumbersome task. The evaluation of different event extraction processes using object extraction, spatial and temporal relationship with respect to event is summarized. With this evaluation this paper opens a way for effective domain-specific ontology creation of video content extraction. This paper mainly focuses on real-time sport domain-based video content extraction.

Keywords: Ontology, Video content extraction, Semantic gap, Information retrieval.

INTRODUCTION

The core components of video content are raw video data and the video metadata. The video metadata are generally created either through manual or semi-automatic annotation tool. In this study paper we have analyzed the ontology-based automatic semantic content extraction framework. To describe the objects that exist in the world and their relationships, the term ontology is used by researchers. Ontology consists of a set of definitions of concepts, properties, relations, constraints, axioms, processes and occasions that depict a sure space or universe of talk. Ontology can also be defined as “an explicit specification of a conceptualization” [1].

In the recent years a few standard depiction dialects for the statement of Concepts and relationships in domain ontology have been defined. Among these the most vital are, Resource Description Framework Schema (RDFS), Web Ontology Language (OWL) and, for interactive media, the XML Schema in MPEG-7. Using these dialects metadata can be fitted to particular domains and purposes.

Clearly, incorporating preceding knowledge is an important for the retrieval as well, to permit comprehension of the semantics of client hunt, and in this way, adjusting and coordinating to the substance annotation semantic exclusive information representation arrangements, albeit powerful inside of the predefined use connection, force genuine confinements considering Consequently, taking after the ontology-based worldview for the annotation’s representation metadata involves noteworthy preferences with the end goal of semantic hunt and retrieval. All the more particularly, unlike keyword-based annotations, ontology-based annotations reusability and interoperability.

Supported by the rise of the Semantic Web, the requirement for shareable, adequately rich, information representation formalists has resuscitated premium and offered ascend to cutting edge learning displaying arrangements. Ontologies [2], promising a typical and shared comprehension of an area, have transformed up into key empowering advances giving machine justifiable semantics. Moreover, because of the very much characterized semantics, ontologies give computerized exploiting so as to surmise bolster that can further up grade recovery concealed reasonable affiliations revelation and deduction of new ones for acknowledging semantic-based suggestion administrations.

ONTOLOGY BASED INFORMATION EXTRACTION

In ontology-based image retrieval system, a domain specific ontology creation is the key contribution. Most of the image retrieval systems using ontology had concentrated in creating the ontology with respect to domain knowledge. Osman.Tet.al [4] created abstract domain ontology for sports domain. In their ontology attributes such as event name, team name, player name and manager name were included as textual attribute and for images; they used the attributes such as size, format, and contrast of the image. In the work of Farah.I.Ret.al [5] for each satellite picture, they had made three model of ontology: the scene model ontology sensor model ontology, and spatial connection model ontology. At that
In all these works, the creation of ontology using textual annotation of the images was used. The combination of textual and visual feature ontology creation was not elaborated in these works. The main problem of this work was to represent pixels of images into ontology. This problem was one of the main objectives of this work. That is, to understand the image features generically. Creating ontology generally for images was one of the obstacles in this work, so domain had to be considered before studying the feature of the image. Table 1 list out some of the ontology.

**METHODOLOGY USED FOR VIDEO CONTENT EXTRACTION**

From massive amounts of visual data retrieval of the desired video clipping semantically is an unreachable goal. The general methodology to handle real-time sport streaming video is discussed below:

<table>
<thead>
<tr>
<th>Author</th>
<th>Domain</th>
<th>Approach to create Ontology</th>
<th>Textual Feature</th>
<th>Image Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osman (2007)</td>
<td>Sports Domain</td>
<td>Names of team, player and manager</td>
<td>Image size, format and contrast</td>
<td></td>
</tr>
<tr>
<td>Imed Rial Farah (2008)</td>
<td>Satellite Images</td>
<td>Textual description with respect to scene, sensor and spatial relation</td>
<td></td>
<td>NIL</td>
</tr>
<tr>
<td>Shi.L (2008)</td>
<td>Natural Images</td>
<td>NIL</td>
<td>Images are sub-divided and general feature are used</td>
<td></td>
</tr>
<tr>
<td>Shareha (2009)</td>
<td>Human and animal</td>
<td>Textual keywords</td>
<td>Image annotation</td>
<td></td>
</tr>
<tr>
<td>Koletsis.(2010)</td>
<td>Dog</td>
<td>MPEG 7 features</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yakup Yildirim (2013)</td>
<td>Basketball</td>
<td>Description of Action and activity of the game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khushboo Khurana (2013)</td>
<td>Locomotive</td>
<td>XML description</td>
<td>SIFT</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE I. Ontology based information Extraction**

AUTOMATIC OBJECT EVENT AND CONCEPT EXTRACTION

As per [9] they designed a video database model (OVDAM) which provides automatic object event and of idea extraction. By utilizing preparing sets and master assessments, low-level component values for objects and relations between objects are resolved. N-Cut image segmentation algorithm is utilized to focus sections in video key frames and the genetic algorithm-based classifier is utilized to make characterization segments to objects. At the top level ontology of objects, events and concepts are used. The system has a reliable video data model, which gives the user the ability to make, concepts and low-level features are handled.

The urgent need for multimedia databases is the fundamental to process the data for feature extraction and labelling forward to storage an ontology-supported fuzzy querying. RDF is
utilized to speak to metadata. OWL is utilized to speak to ontology and RDQL is utilized for querying. Questions containing objects, events, spatio-temporal clauses querying.

AUTOMATIC DETECTION AND TRAC-KING OF OBJECT

A tool for the automatic exposure and tracking of projecting objects, and derivation of spatio-temporal relation in video. They provide a fully automatic video annotation tool. The proposed structure covers an adaptable building design for feature handling and phases of shot limit disclosure, projecting object revelation and tracking, and knowledge-base development for compelling spatio-transient object questioning.

SEMANTIC EVENT EXTRACTION

Based on basketball webcasting content in telecast video a novel multi-modal framework for semantic occasion extraction is constructed in [11]. The creator attempted to connect the semantic crevice between low-level elements and abnormal state occasions and facilitates personalization of the sports video. Effective result was obtained on real-world video clips by using image analysis, video analysis and text/video positioning. To automatically detecting the event from the web-cast an unsupervised clustering algorithm were used instead of pre-defined keyword based classification. To detect the event boundary in the basketball video a demographic approach instead of exact state machine were used.

ONTOLOGY CREATION

An multimedia ontology is constructed for soccer video domain. That ontology include linguistic and dynamic visual ontologies. The structure of the derived ontology itself, grouped with reasoning, can be utilized to perform more elevated amount annotation of the clasps, to produce complex questions that include activities and their transient development and relations and to make broadened content editorials of feature successions.

CONCLUSION

In this survey paper, the basic requirement for video content extraction was discussed. The usage of ontology gradually bridges the semantic gap between the low-level and high-level visual content is justified. Some of the eminent work that integrates the ontology with video visual content are discussed in this paper. The creation of multimedia ontology with respect to the appropriate domain is the challenging part of this work. Once the ontology is created the real-time event extraction based on ontology is performed. The semantic gap can be narrowed a bit by apply fuzzy logic in the created ontology which would be the future scope of this paper.

REFERENCES


