

Harmonized Media Service Middleware Using to Emotional Knowledge

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Abstract

In recent, service providers would like to support actual feeling services for internet users to give a satisfaction. Since web environments are changed more newly, internet users want to satisfy their needs. For offering the satisfaction to users, we suggest a middleware to give impressive media that is named Harmonized Media Service Middleware (HMSM). HMSM can support the harmonized media by using some emotional knowledge for each user. The harmonized media is constructed with media content, like videos, and emotional effects. The video content is made by individually user, so it has a just recorded data as simple media. However, because user wants to a feeling of satisfaction, it is necessary to offer multiple media which include emotional effects for user's impression. In this paper, we suggest a way to offer a middleware for actual feeling multiple media, called HMSM. HMSM analyzes the input media and then extracts the effects which have compatibility with the input media from emotional effect database. At the result, HMSM will be offer actual feeling service to satisfy user's needs.

Keywords: harmony, emotional, media service, actual feeling, middleware.

1. Introduction

Recently, the concept of web2.0 that has ideal of participation, sharing and opening is revitalized on the web. Internet users are easily able to access UGC (User Generated Contents) through media sharing site like the Youtube.com [1]. Users are beginning to make contents rather than just consuming information that offered the web. In addition, users want to open their contents that were designed themselves. To reflect the flow of user's preference, the media sharing sites are grown rapidly and UGCs are distributed on that site.

Despite of the growth of personal media contents industries, making contents by internet users has lots of lacks that additional media to satisfy consumers hardly supply. If the making contents attach additional media to supply a satisfaction of the consumers who want to fill their emotional, the using process that taken media is harmonized with other media effects that can give consumers satisfaction in having harmonized media.

In this paper, we suggest a new notion of harmonized media service middleware which designed to give satisfaction to consumers and to develop simple media that has only taken pictures into multiple media that has emotional effects.

Just using the Harmonized media service middleware is able to give consumers proper harmonized media and can meet consumer's satisfaction. The harmonized media service middleware analyzes an input media based on ontology concept and then extracts some emotional media that would fulfill consumers through the analyzed knowledge [2]. Both

the input media and the extracted emotional media are harmonized by Harmonized media service middleware (HMSM) for offer consumer satisfaction about reproducing media.

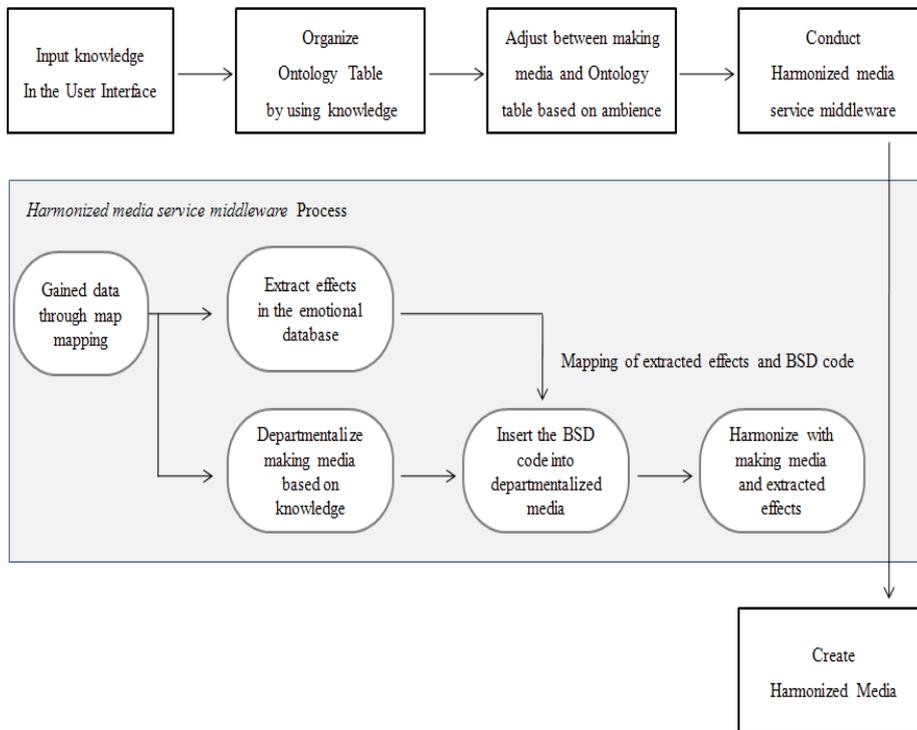


Figure 1. Process of Harmonized media service middleware

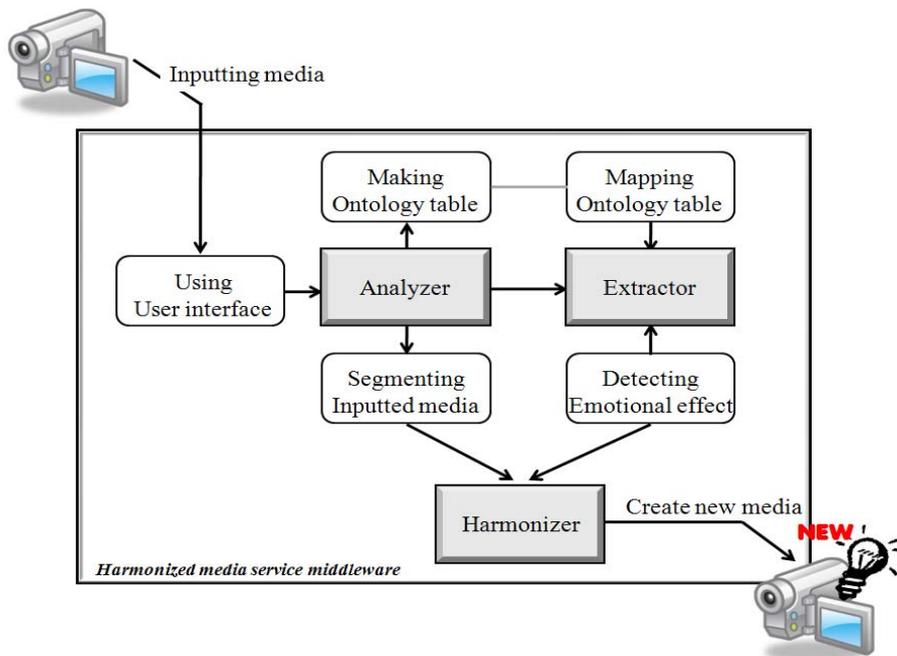


Figure 2. Structure of Harmonized media service middleware

2. Related Works

In order to use the video contents saving the departmentalized video contents based on ontology and adding some proper effects to them, we can utilize the International Standard MPEG-7 that enables us to deal with multimedia contents effectively.

Semantic web technology realizes semantic interoperability based on well defined meaning that computer can recognize through widening the existing web and cooperative structure between computers and human being. Semantic web [3] technology is the next generation technology that not only expresses data for human being but also enables computers to understand, unify and recycle the data. Ontology offers the meaning of Domain languages as common typical naming structures. Ontology is a kind of knowledge expression. Computers only recognize and manage Ontology data. Ontology axiom and rule are necessary to treat inference. The information related to Ontology is useful because theory is needed when we make contents based on Ontology study and package them.

MPEG-7 [11] is the international standard multimedia contents method that helps us to manage multimedia information effectively. It is the way to write multimedia contents, in other words, it is the standard for definition of Metadata. The MPEG-7 provides Visual description and description of color, texture and texture. Audio part of the MPEG-7 suggests Fundamental of Audio description, information about Spoken Contents, and Sound Classification Model. The MPEG-7 provides Metadata about multimedia. However, Metadata has only its own information, so it is impossible to provide actual feeling to the multimedia contents by using the MPEG-7. Thus, it is needed to add a model that makes the multimedia contents effective and rich to the MPEG-7 model.

3. Harmonized media service middleware

Suggested Harmonized media service middleware (HMSM) in this paper conducts to develop simple media into multiple media by fusing both inputted media and emotionally additional media. The type of additional media is varied. For example text, sound, image and music can be an additional media type. These events as emotional effect based on ambience are extracted after grasp the relationship between inputted media and effects.

In "Figure 1" shows process of Harmonized media service middleware. As an advance step for giving emotional effects in substance, obtained meta information by maker from designed user interface. And then we consist of ontology table based on obtained information. It can conduct mapping process between ontology table and inputted media by using the ambience data that one of the meta information. After former operation, Harmonized media service middleware carry out departmentalize making media around inputted knowledge. After that, it can obtain emotional effects from emotional database through map mapping step. For harmonizing between inputted media and extracted effects, use the BSD (Bitstream Syntax Description) code of MPEG-21 [12] specification. By inserting BSD code into departmentalized inputted media and extracted effects can be possible that to fuse inputted media and extracts effect and to create new media which has emotion.

3.1. Formation of Harmonized media service middleware

For offering emotional media suggested Harmonized media service middleware that consist of 3 parts Analyzer, Extractor and Harmonizer. Through 3 steps, emotional media

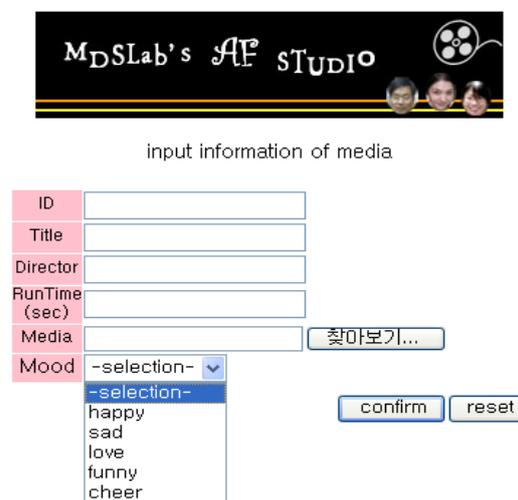
can be serviced to customers. The “Figure 2” shows formation of Harmonized media service middleware.

Harmonized media service middleware conducts 3 steps to service emotional media that has actual feeling. First step, Analyzer executes analysis about inputted media contents by practicing techniques of MPEG-7. Analyzer should departmentalize inputted media as scene. It divides into concept of ontology and applies to technique specification of MPEG-7 based on knowledge that obtained through user interface. Second step, Extractor executes process about effects. Extractor should extract effects that have relation to inputted media from emotional effect database. At last, Harmonizer fuse departmentalized media that gain by conducting step1 with emotional effects that gain by conducting step2. The method of fusion use BSD code of MPEG-21. Both departmentalized media and extracted effects have individual BSD code that doesn't duplicate. Through 3 steps, inputted media can be developed multiple media that includes emotional context. As a result, Harmonized media service middleware can create new media.

4. Algorithm

4.1. Analyzer

The step of Analyzer executes analysis of inputted media that uploaded by maker as internet user. Analyzer step is able to take user interface for obtain necessary knowledge about inputted media. In the “Figure 3” shows user interface. This paper selects category of ambience type like happy, sad, love, funny and cheer as key issue.



The screenshot shows a web-based user interface for entering media metadata. At the top, there is a banner for 'MDSLab's AE STUDIO' with a film strip graphic and a logo. Below the banner, the text 'input information of media' is centered. The form consists of several input fields with labels on the left: 'ID', 'Title', 'Director', 'RunTime (sec)', 'Media', and 'Mood'. The 'Mood' field is a dropdown menu currently showing '-selection-' with a list of options: 'happy', 'sad', 'love', 'funny', and 'cheer'. To the right of the 'Media' field is a button labeled '찾아보기...'. Below the form are two buttons: 'confirm' and 'reset'.

Figure 3. User Interface to input media meta information

4.2. Extractor

The step of Extractor executes Extraction of emotional effects from emotional effect database. Extractor should extract effects based on knowledge that is discovered through former Analyzer step. Proper effects are selected by mapping between ambience of information through user interface and meta knowledge of stored effects into emotional

effects database. It can upgrade quality of inputted media and increase satisfaction for customers. At first, ambience of inputted media and effects must correspond absolutely. Following, selected type should correspond too. To select proper effects, this paper offers ontology tables like “Figure 4”.

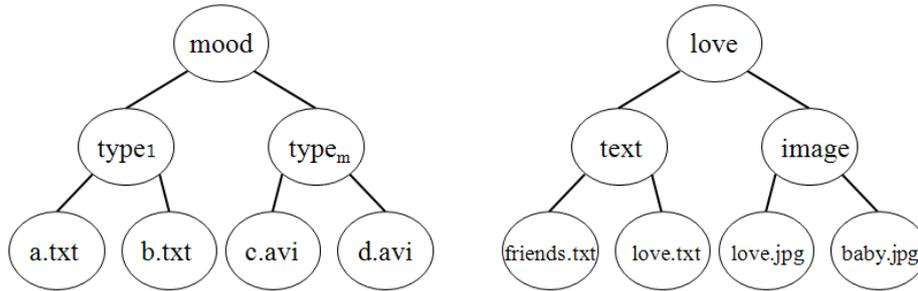


Figure 4. Present as tree of ontology mapping rule

Also, ontology table can be accounted for formula.

Following:

$$M = \{ \text{happy} \mid \text{sad} \mid \text{love} \mid \dots \mid \text{ambience}_i \}$$

$$T = \{ \text{text} \mid \text{sound} \mid \text{music} \mid \text{image} \}$$

$$\text{MEDIA} = \{ \text{ambience}, \text{type} \}$$

$$\text{ambience} \in M, \text{type} \in T$$

$$S_m = \text{ambience} \cap \text{type}$$

Set M includes a variety of ambiences. Set T includes a type of effects which will add media. MEDIA consists of ambience and type which will be offered in substance. To detect proper effects, S_m (serviced media) is designed to select with satisfaction both elements.

4.3. Harmonizer

The step of Harmonizer executes fusion of emotional effects and inputted media. Through this step, Harmonized media service middleware can create new media that has actual feeling. Inputted media divides into each scene and inserts extracted effects into a gap in scenes. This process can present formula.

Following:

$$\text{Scene} = \{ S_1 + S_2 + S_3 + \dots + S_{m-1} + S_m \}$$

$$\text{Media} = \{ E_1 + E_2 + E_3 + \dots + E_{n-1} + E_n \}$$

$$\text{HaM} = \sum_{i=1, j=1}^{m, n} S_i + E_j$$

Scene of inputted media is divided from Analyzer step and present a set from 1 to m. Media of extracted ontology mapping table is consisted of effects from 1 to n. HaM means Harmonized media which actualize fusion by adding scene and effects.

5. Realization of HMSM

In this paper, originally simple media can develop multiple media by conducting Harmonized media service middleware. To maintain compatibility between inputted media and emotional effects, it adapts to method that extract emotional effects by using ambience information and insert effects into media. Media knowledge received through user interface information match the effects.

Personally in the case of the content value of the grant can be realized. If you have a video content personality that recorded at a wedding, the media could have a lot of noise. In addition, it is difficult that give us serious feeling rather than recording media by experts. Harmonized media service middleware is able to offer new media that add emotional effects like sound, image and text etc. So consumer who offered new media that has actual feeling is serviced opportunity that can feel impressive media. In the "Figure 5" shows remake media. For remove noise inside media, proper music that selected Extractor step add the original media. Of course, the music has compatibility with original media.

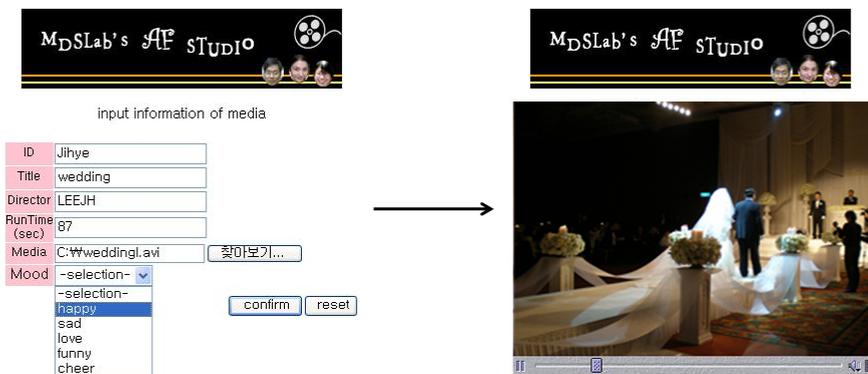


Figure 5. Implement example through HMSM

Way to add effects increase the quality of the media itself, and the satisfaction of both makers and consumers.

6. Conclusions

In this paper, we designed Harmonized media service middleware which have a goal that offers consumers a new media. New media service actual feeling by using emotional knowledge.

Harmonized media service middleware processes 3 steps, Analyzer, Extractor and Harmonizer; each step should execute its work itself. Content uploading by internet user just has simple information as User Create Contents (UCC) however, through the Harmonized media service middleware, original inputted media can be changed multiple media as User Generated Contents (UGC) that could present actual feeling by using emotional knowledge. As a result, we suggest *Harmonized media service middleware* for grant harmonized media service.

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