IMPLEMENTATIONS OF PERSONALIZED SOCIAL CONTENTS SERVICES BASED ON KNOWLEDGE BASE ANALYZED WITH MULTIPLE FACTORS

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ABSTRACT – This paper introduces the content mindmap service that a personalized social contents service by using the automatically built knowledge base based on various features. This service provides content based on newly defined meaningful information based on their correlation which is analyzed as a ‘social broadcasting’ service by analyzing a massive amount of data poured on the social media. Mind map supports the operation of social broadcasting service by analyzing the various existing content on the web.

Keywords: Social contents services, contents knowledge bases, semantic relations, spatial relations

1. INTRODUCTION

A social broadcasting service is defined as a service that analyzes a massive amount of data poured on social media and provides content services based on newly defined meaningful information based on their correlation [1]. The Mindmap service introduced in this paper contains the contents knowledge base which represents the semantic and spatial relations between contents from web, the augmented reality based UI supports this services.

2. MULTIPLE FACTOR BASED CONTENTS KNOWLEDGE BASE

In order to construct and operate a social broadcasting system, it is necessary to construct and operate a high quality knowledge base mapped with related contents by extracting collective intelligence shared in social media. The automatically constructed knowledge base contains the information about spatial factors and semantic factors for the contained contents. The spatial factor means the specific location data about each content, this information is capable of space based personalized contents services. The semantic factors are constructed with the contents relation networks and the keyword relation networks which are automatically extracted from social data.

2.1. Construction of semantic factors

Figure 1. shows the system architecture about the proposed system in this paper. This paper proposes two-layer structure for multimedia knowledge bases. Keywords correlation map (KCM) layer is constructed with the relevant keywords and their correlation strengths. Contents correlation map (CCM) contains multimedia contents and their mapping information with the KCM. With the information, the contents can contain the semantic relations between the contents.
In the KCM process, the system gathered the news articles from January 2009 to July 2015 in Naver and Daily sports for baseball domain, and processed Named-Entity Recognition. The top 1,000 terms were initially decided with the seed keywords for constructing the keywords correlation map. The keyword relations are decided with the analysis of the collocations of the seed keywords. The strength of a keyword relations between two keywords is defined with the product of the term frequency and the document frequency for the collocation. The semantic factors in the knowledge base of Mind map are automatically constructed by analyzing large amount of unstructured data – news articles and YouTube video clips and the related metadata. The unstructured text contains a total of 570,711 articles and 5,621,754 sentences. The expanded keywords were converged to a total of 3,002 through an iterative process of expanding the newly appeared words into keywords. This paper constructed the CCM with video clips extracted from the social media service by using YouTube Open API. The linkage between the extracted key words and the associated keywords expresses the semantic relationship information between the contents. About 80,000 videos related to professional baseball related to the keywords was constructed by automatically matching the videos that can issue the keywords of the content mind map. [2]

2.2. Construction of spatial factors
The spatial factors are constructed with two kinds of process: User registration and location prediction engine. When registering contents, users can register the uploading locations with GPS format, this is used in the knowledge base. In case of the contents without location, Mindmap knowledge based construction engine contains the rule-based location prediction module based on the ten professional basketball stadium in Korea by referencing metadata kewords.

3. Mindmap: Prototype UI
This supports augment reality based mobile application as shown in Figure 2. Users can use voice and text as the input interface. Moreover, this service supports the personal location based contents services without user input according to the user position and orientation by the augmented view and list view.

![Figure 2. System Architecture](image)

![Figure 3. Mindmap prototype UI](image)

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