

## Disaster and Safety Map Services Using Real Time Big Data Analysis

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### ABSTRACT

In my paper, an evaluation method on naturalness and urbanness characterizations of animation image is proposed. In contrast to the prior works, we intend to give the exact degree of naturalness and urbanness by combining the low-level visual feature-based schemes with the biological visual schemes. In our method, four descriptors are extracted and pseudoinverse is adopted. By this method, we can experiment on the exact degree of naturalness and urbanness with satisfactory results.

### I. INTRODUCTION

With the development of internet, the rapid supply of smart devices, and the exponential increase of SNS users, big data have been built. The collection, management, and utilization of big data have been become important issues in the big data fields. Big data has wide applications ranging from situation awareness, decision-making to the areas to predict the near future through big data analysis.

Recently, analysis techniques to extract new meanings using big data analysis and various services using these analysis techniques have been developed. It is necessary to process data to get meaningful information from the huge amount of structured and unstructured data, even in the disaster and safety management. Using the extracted information, it is

possible to preemptively respond by rapidly analyzing large amounts of data from natural disasters and man-made disasters. These services have gotten a lot of attentions in order to keep human life protection and economic assets.

The existing disaster and safety-related services generally provide structured data analysis using public data. Information provided through realtime data analysis in the existing services does not fully reflect the needs of users and is also not adequate. In this paper, we design and implement a disaster and safety map service using a realtime big data analysis. The disaster and safety map service retrieves and processes large amounts of data being collected in realtime. In addition, it analyzes risk factors and provides users with predicted information by aggregating the collected realtime data and past data. Users can prepare for potential disaster and safety risks through the proposed service.

### 2. The proposed disaster and safety map service

In this paper, we propose a disaster and safety map service using a realtime big data analysis. The proposed service analyzes the various types of data and provides a user with predicted meaningful information such as disaster prediction, shelters, and safe places. Figure 1 shows the process of the

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proposed service. The proposed system collects the various types of data that is classified into structured, semi-structured, and unstructured types, and processes and stores the data. It provides a user with the current location and surrounding information through various analyses of the stored data, the input information of the user, and GPS location information using smart devices. When a risk occurs, the proposed service notifies a user immediately.



Figure 1. The process of the proposed service

The proposed service is developed based on a client-server architecture. When a client asks for the service and a query, a server provides the client with big data analysis results. More specifically, the server gathers the structured and semi-structured types of public data and stores and manages them. In addition, it collects the unstructured type of data through SNS and social media. The proposed service analyzes them using various big data analysis techniques. Figure 2 shows the proposed system architecture. In the data analysis process, the proposed service extracts meaningful and valuable information from a huge amount of collected data and stores the extracted information in order to utilize it in the future. The proposed service provides a client with useful information by processing the stored data and the history information about disasters based on analysis techniques such as statistical analysis, association analysis, keyword analysis, and prediction. As a result, a user can prepare for disaster risks through predicted information.

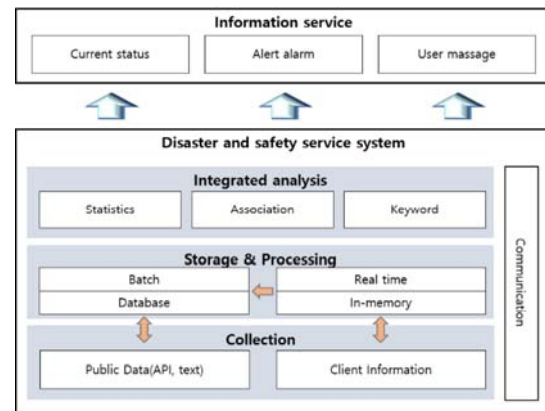


Figure 2. The system architecture

### 3. Implementation

Figure 3 shows the implementation results of the proposed system. The proposed system was implemented with JavaScript and HTML in Android environments on CPU Intel(R) core i3-2100 3.10GHz and CentOS (ver. 6.7). The disaster service provides a user with various functions such as daily weather information and the news of a particular region. It also gives the predicted risk information of a region to a user by analyzing the past 30 years of flood damage data and the amount of current hourly rainfall.

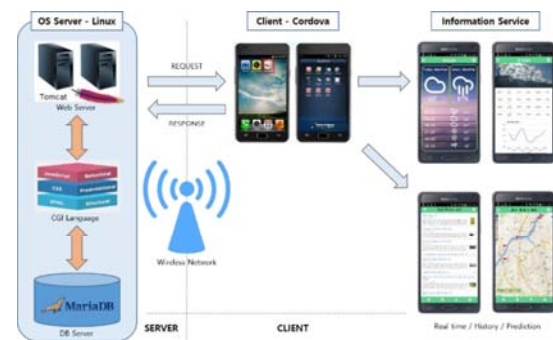


Figure 3. The implementation result of the proposed system

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