



Multi-Format Information Fusion through Integrated Metadata Using Hybrid Ontology for Disaster Management

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ABSTRACT

Finding relevant disaster data from a huge metadata overhead often results in frustrating search experiences caused by unclear access points, ambiguous search methods, unsuitable metadata, and long response times. More frequently, semantic relation between the retrieved objects is neglected. This paper presents a system architecture that makes use of ontologies in order to enable semantic metadata descriptions for gathering and integrating multi-format documents in the context of disaster management. After a brief discussion on the challenges of the integration process, the Multi-format Information Retrieval, Integration and Presentation (MIRIP) architecture is presented. A specific approach for ontology development and mapping process is introduced in order to semantically associate user's query and documents metadata. An ontology model approach was designed to follow inspirational and collaborative approaches with top-down to bottom-up implementation. A prototype of the integrated disaster management information system is currently under development, based on the architecture that is presented in this paper.

Keywords: Ontology Engineering, hybrid ontology, multi-format document, metadata integration, disaster management

INTRODUCTION

In managing disasters at all stages, a large amount of information within multiple media documents is produced and collected. The information contained in spatial and non-spatial documents, which were collected before and after disasters, is composed of collections of features, coverage and high-resolution imageries, snap photos, text report, video and audio clips. Even though

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