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Openis: Information System for Disaster Management

This position paper presents research and advanced development opportunities found in the process of fleshing out the architectural foundation and design of an open information system for natural disaster management. The system, called OpenIS for short, aims to facilitate the access, mining and fusion of data and information by application systems and services that are designed to support decisions and operations during all phases of disaster management, including disaster prevention and preparedness, monitoring and warning, response and recovery. In particular, an objective of OpenIS is to weave together real-time and archival data and information from diverse sources so that it can offer application systems and services less fragmented and more trustworthy information with higher availability.

At the core, OpenIS appears to the applications and services relying on it to be a system of physical and virtual data repositories. In essence, the system provides a flexible framework supported by infrastructure components and tools for the incorporation and collaboration of independently developed and maintained data and information sources and applications. Real-time and historical data and information provided by the sources range from remote and in-situ sensor data collected and contributed by an open sensor information system (OpenSensorIS) to other types of real-time data such as time-varying meteorological models, traffic densities and road conditions from weather bureau and transportation agencies. OpenIS will also make available census data and other relevant geographical information; machine-readable government information on standard operation procedures, contacts, etc.; and news, eyewitness reports, and other types of soft information. A key component of OpenIS is a suite of trusted access control mechanisms capable of supporting diverse normal and emergency information access policies: The system should enable individual

data stakeholders from government, enterprises, research communities, private organizations and so on to easily define and tailor the policies best suited to govern when, under what conditions, to whom and to what extent their data are open. The system also needs to provide privacy protection and information flow barriers to safeguard the confidentiality of information flowing through OpenIS for disaster management purposes.

OpenIS also aims to provide a wide range of information filtering, fusion, extraction and mining tools and social networking, syndication and feed services. By doing so, the system aims to ease the effort and reduce the time needed to develop disaster management applications.