



## **Social Media in Crisis Management and Forensic Disaster Analysis**

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Today, modern sensors or sensor networks provide good quality measurements for the observation of large-scale emergencies as a result of natural disasters. Mostly however, only at certain points in their respective locations and for a very limited number of measurement parameters (e.g. seismograph) and not over the entire course of a disaster event.

The proliferation of different social media application (e.g. Twitter, Facebook, Google+, etc.), yields the possibility to use the resulting data as a free and fast supplement or complement to traditional monitoring techniques. In particular, these new channels can serve for rapid detection, for information gathering for emergency protection and for information dissemination. Thus, each user of these networks represents a so-called virtual sensor ("social sensor"), whose eyewitness account can be important for understanding the situation on the ground. The advantages of these social sensors are the high mobility, the versatility of the parameters that can be captured (text, images, videos, etc.) as well as the rapid spread of information. Due to the subjective characteristics however, the data often show different quality and quantity.

Against this background, it is essential for an application in crisis management to reasonably (pre-)process the data from social media. Hence, fully-automated processes are used which adequately filter and structure the enormous amount of information and associate it with an event, respectively, a geographic location. This is done through statistical monitoring of the volume of messages (Twitter) in different geographic regions of the world. In combination with a frequency analysis with respect to disaster-relevant terms (in 43 languages), thematic as well as spatio-temporal clustering, an initial assessment regarding the severity and extent of the detected event, its classification and (spatio-temporal) localization can be achieved. This detection in real time (2–5 minutes) thus allows gathering first responder reports or eyewitness reports, which can provide important information for a first situation analysis for the various officials and volunteers, especially in case of large-scale emergencies. Eventually, this can be used in combination with conventional sensors and information sources to conduct a detailed forensic disaster analysis of an event.