Image-based modelling for emergency management

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Natural and man-made disasters have had a great impact lately worldwide. As global communication intensifies we are becoming increasingly aware of the amount of damage that is done in terms of injuries to and loss of humans and materials. Therefore a tremendous amount of efforts goes into activities aiming at disaster mitigation and early and effective rescue actions.

In this context disaster response planning plays a specific role. Disaster response planning consists of three components: (a) development of damage simulation models, (b) methods and models to rapidly assess damage, and (c) methods to allocate limited resources in an optimal way. Among the various techniques applied in this domain remote sensing technology can contribute in particular to (a) and (b), but to a certain extent also to (c).

In this presentation the emphasis will be on the characteristics and use of image-based techniques.

We dispose nowadays of a large spectrum of different sensors, operating from a variety of platforms like satellites (optical, radar), aerial (images, LiDAR, helicopters, UAVs) and terrestrial (Mobile Mapping systems, flying "mosquito" robots). We will show how these techniques can be used both for simulation of events, risk analysis and for the empirical analysis of events and prevention, and for the monitoring of actual events.

The true challenge today lies not so much in sensing, but in data processing. Especially if on-line processing and real-time responses are required, the lack of performance in data processing techniques is still an annoying factor.

This presentation will cover all aspects from sensing to data processing, supported by a number of exemplary international projects.