A data mining approach to post disaster assessment of 2008 floods in Romania

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This paper demonstrates the performance of arapid mapping kind of approach considering knowledge discovery from Earth Observation images, to provide information support during response and immediate post-response bydelivering products emphasizing the extent and impact of the event, by event understanding any type of natural or man made disaster.

Knowledge discovery from Earth Observation images implies mapping low level descriptors (primitive features) extracted from the image into semantic classes in order to provide an interactive method for effective image information mining.In the frame of information theory a communication channel is considered between remote sensing imagery and the user who receive existing information in the data sources, coded as image semantic content. This channel has three components - Data Source Model Generation, Query and Data Mining. Data Source Model Generation uses image content analysis to generate a set of scene's content descriptors. Further, the Query component involves the user and performs an image retrievalbased on image content as query parameter. The query component relies on the Support Vector Machine classifier which is able to group descriptors into relevant semantic classes. The classifier supports rapid mapping scenarios and interactive mapping.

The proposed concept is illustrated analyzing Earth Observation images acquired pre and post (SPOT 4- 20m resolution) floods disaster in Romania at the end of July 2008. Hundreds of towns and villages were affected and more than 20,000 people evacuated. The northeastern region of Romania was declared back then national disaster area. The results includes potentially flood affected areas detected on 28 of July, detailed semantic classes for rapid mapping and a quantitative evaluation of damages.

A validation procedure is considered, taking into account rapid mapping products delivered by Romanian Space Agency (ROSA) and SERTIT (SErviceRégional de Traitementd'Image et de Télédétection).