

## RAPID MAPPING FOR CRISIS MANAGEMENT – INTRODUCTION

My dissertation topic focuses on rapid mapping and its use in crisis management. The basic structure of my work consists of description of **ways how to get** data from endangered areas very quickly and turn them into a format usable for emergency services, decision makers etc. in real-time and efficiently. This thing has usually been difficult to do properly so I hope to find a solution how to make it much better.

There are some ways to process the data from satellites for use in crisis management but they are usually very slow and often not very accurate (for example making maps from the OpenStreetMap by volunteers or Copernicus Emergency Management Site). My task in my topic is to create a new way how to automatize the processing of the data and turning them into a real tool for decision making.

One of the main tasks in my work is to develop a system of automated classification of objects in endangered areas so that the final application of the system makes it possible to put satellite data into the system and get the map with all features the user needs in real-time. The real-time factor is very important here because the sooner the information gets to the crisis management authorities, the better decisions and actions can be made and at the end also more inhabitants and properties can be saved from the injuries/death and damage. The problem of this task is to find out how to program the algorithms which could be responsible for the process. A second part could be finding the right data sources for this purpose (so that the algorithm works with high quality data). The main criteria for selecting the input data for crisis management should be time resolution and availability. Therefore I think that possibly the best choice should be data from Copernicus programme which are very accurate and also free to use.

The **sources for** my topic vary depending on a selected area and phenomenon but I could definitely use for example these ones:

BACHER, Uwe a Helmut MAYER: AUTOMATIC ROAD EXTRACTION FROM MULTISPECTRAL HIGH RESOLUTION SATELLITE IMAGES. *CMRT05* [online]. Vienna: IAPRS, 2005, XXXVI(3/W24), 29-34 [cit. 2019-04-26]. URL: [https://www.isprs.org/proceedings/XXXVI/3-W24/papers/CMRT05\\_Bacher\\_Mayer.pdf](https://www.isprs.org/proceedings/XXXVI/3-W24/papers/CMRT05_Bacher_Mayer.pdf)

P. Lu, A. Stumpf, N. Kerle and N. Casagli: Object-Oriented Change Detection for Landslide Rapid Mapping, in *IEEE Geoscience and Remote Sensing Letters*, vol. 8, no. 4, pp. 701-705, July 2011. doi: 10.1109/LGRS.2010.2101045  
URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5710959&isnumber=5910657>

VOIGT, Stefan a kol. Rapid Damage Assessment and Situation Mapping: Learning from the 2010 Haiti Earthquake. *Photogrammetric Engineering and Remote Sensing* [online]. 2011, **77**(9), 923-931 [cit. 2019-04-26]. DOI: 10.14358. URL: [https://www.researchgate.net/publication/231338199\\_Rapid\\_Damage\\_Assessment\\_and\\_Situation\\_Mapping\\_Learning\\_from\\_the\\_2010\\_Haiti\\_Earthquake](https://www.researchgate.net/publication/231338199_Rapid_Damage_Assessment_and_Situation_Mapping_Learning_from_the_2010_Haiti_Earthquake)

VOIGT, Stefan a kol. Satellite Image Analysis for Disaster and Crisis-Management Support. *IEEE Transactions on Geoscience and Remote Sensing* [online]. 2007, **45**(6), 1520-1528 [cit. 2019-04-26]. DOI: 10.14358. ISSN 1558-0644. URL: <https://ieeexplore.ieee.org/abstract/document/4215094>

ROCHE, Stephane a kol. GeoWeb and crisis management: issues and perspectives of volunteered geographic information. *GeoJournal* [online]. 2007, **78**(1), 21-40 [cit. 2019-04-26]. ISSN 1572-9893. URL: <https://link.springer.com/article/10.1007/s10708-011-9423-9>  
[https://link.springer.com/chapter/10.1007/11427995\\_39](https://link.springer.com/chapter/10.1007/11427995_39)

FRIEDMANNOVÁ, Lucie, Milan KONEČNÝ a Karel STANĚK. *An adaptive cartographic visualization for support of the crisis management* [online]. 2006 [cit. 2019-04-26]. URL: [https://www.researchgate.net/publication/228919107\\_An\\_adaptive\\_cartographic\\_visualization\\_for\\_support\\_of\\_the\\_crisis\\_management](https://www.researchgate.net/publication/228919107_An_adaptive_cartographic_visualization_for_support_of_the_crisis_management)

ROBINSON, Anthony, Robert ROTH a Alan MACEACHREN. Challenges for Map Symbol Standardization in Crisis Management. *Proceedings of the 7 th International ISCRAM Conference* [online]. Seattle, 2010 [cit. 2019-04-26]. URL: [http://www.personal.psu.edu/users/a/c/acr181/222-Robinson\\_etal.pdf](http://www.personal.psu.edu/users/a/c/acr181/222-Robinson_etal.pdf)

KUBÍČEK, Petr a Jiří KOZEL. Cartographic Techniques for Adaptive Emergency Mapping. *Risk Models and Applications*, [online]. CODATA-Germany, 2010, 49-62 [cit. 2019-04-26]. URL: [https://www.researchgate.net/publication/289532888\\_Cartographic\\_Techniques\\_for\\_Adaptive\\_Emergency\\_Mapping](https://www.researchgate.net/publication/289532888_Cartographic_Techniques_for_Adaptive_Emergency_Mapping)