



An integrated, open-source set of tools for urban vulnerability monitoring from Earth observation data

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Aim: The paper introduces an integrated set of open-source tools designed to process medium and high-resolution imagery with the aim to extract vulnerability indicators [1].

Problem: In the context of risk monitoring [2], a series of vulnerability proxies can be defined, such as the extension of a built-up area or buildings regularity [3]. Different open-source C and Python libraries are already available for image processing and geospatial information (e.g. OrfeoToolbox, OpenCV and GDAL). They include basic processing tools but not vulnerability-oriented workflows. Therefore, it is of significant importance to provide end-users with a set of tools capable to return information at a higher level.

Solution: The proposed set of python algorithms is a combination of low-level image processing and geospatial information handling tools along with high-level workflows. In particular, two main products are released under the GPL license: source code, developers-oriented, and a QGIS plugin. These tools were produced within the SENSUM project framework (ended December 2014) where the main focus was on earthquake and landslide risk. Further development and maintenance is guaranteed by the decision to include them in the platform designed within the FP 7 RASOR project .

Conclusion: With the lack of a unified software suite for vulnerability indicators extraction, the proposed solution can provide inputs for already available models like the Global Earthquake Model. The inclusion of the proposed set of algorithms within the RASOR platforms can guarantee support and enlarge the community of end-users.

Keywords:

Vulnerability monitoring, remote sensing, optical imagery, open-source software tools

References

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