

Satellite image analysis for environmental risk assessment

Thematic Session within VipIMAGE2011

III ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing

Olhão, Algarve, Portugal, 12-14 October 2011

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Description

Earth satellite monitoring have become crucial in environmental studies. A large number of important issues can be addressed through satellite images: effects of climate changes, of anthropic intervention, natural hazards and so on. In particular, in the last years their use has incremented allowing monitoring of areas in which dangerous events occur, like earthquakes, fire and floods.

Optical remote sensing makes use of visible, near infrared and short-waveinfrared sensors to form images of the earth's surface by detecting the solar radiation reflected from targets on the ground. The targets can be differentiated by their spectral reflectance signatures in the remotely sensed images. The optical satellite images show advantages in objects recognition due to high spatial resolution and quality; nevertheless they don't provide useful information in any meteorological situation, for example if clouds are present, or in the night. Synthetic Aperture Radar (SAR) data have a great potential as a source of relevant and near real time information for the early warning, mitigation, and management of natural disasters. That is because of its observation capability regardless climate conditions and sun illumination. Indeed, synthetic aperture radar is an active form of remote sensing. The surface is illuminated by a beam of energy with a fixed wavelength that can be anywhere from 1 cm (K band) to approximately 70 cm (P-band). These long wavelengths penetrate clouds and atmospheric interferences common to optical imagery and therefore are not limited spatially or temporally because of solar illumination or atmospheric interferences.

For earth satellite monitoring it is useful to integrate information from different sources, aiming at environmental risk assessments, such as: satellite images, meteorological data, soil and vegetation characteristics, anthropic data, just to mention some. Integration and overlay of several data being either satellite images, of varying support and resolution, or other spatial and temporal data, is a crucial issue since it requires aggregation methods that do not sacrifice resolution nor information from any of the considered sources. Integration methodologies include statistical methods, Bayesian analysis, pattern recognition and machine learning methods.

Topics of interest include (but are not restricted to):

- Satellite image analysis
- Synthetic aperture radar (SAR) images
- Pattern recognition in satellite images
- Satellite image segmentation and classification methods

- Data merging and classification
- Analysis of time series of satellite imagery
- Integration of remote sensing data with GIS technology
- Risk assessment
- Surveillance and monitoring
- Anthropic modeling
- Application in environmental monitoring and characterization
- Application in natural hazards and risk assessment
- Application to risk prevention and disaster management

Publications

The **book of proceedings will be published by Taylor & Francis Group**. The organizers will encourage the submission of extended versions of the accepted papers to related International Journals; in particular for special issues dedicated to the conference.

A **book with 20 invited extended works** from the most important ones presented in conference will be **published by SPRINGER**.

Important dates

- **Submission of extended abstracts: March 15, 2011**
- Authors Notification: April 15, 2011
- Lectures and Final Papers: June 15, 2011

Organizers

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