



Università Tor Vergata, Roma
Ingegneria Civile e Ingegneria Informatica
GeoInformation PhD Curriculum

13th 2013 GeoInformation Seminar

DISP meeting room, Ingegneria dell'Informazione, 1 Via del Politecnico
20 June 2013, starting at 15:00

Daniele Biron

Investigating data management for future Meteosat Third Generation Lightning Imager

The next generation of EUMETSAT geostationary meteorological satellites, Meteosat Third Generation (MTG), will carry an instrument for optical lightning detection, the Lightning Imager (LI). The LI mission is intended to provide a real time lightning detection (both cloud-to-cloud and cloud-to-ground strokes) with accurate location capability, for detection, surveillance and short-term forecast of atmospheric electrical hazards. Main goal of the research project is to fully investigate LI instrument characteristics and expected LI Level 1 data flow, building a convincing simulation environment for LI Level 2 data flow to the users, studying algorithms for fast online individuation of targets, removing false events as induced by several noise sources as particles, jitter, sunglint, background, thermo-mechanical, and electronics. The expected results will help understanding how to manage massive data flow from future MTG-LI at operational user level and how to reach best detection performances, reducing false events to a minimum, within timeliness constraints and without the support of external information.

Zinovia Mitraka

Advanced classification methods for identifying urban morphologies

The need of rigorous methods in urban microclimate studies has emerged from new detailed urban classification schemes, like the recently introduced Local Climate Zones (LCZ). Earth Observation data can be used to characterize the urban surface properties and to determine bio-physical parameters for urban climate modeling and experimental studies. Automated classification methods of urban structures in respect to their microclimatic properties are highly valuable for urban climate studies.

Simone Peronaci

Design of ANNs Algorithm for meteorological and solar radiation forecast using SEVIRI data

MSG (Meteosat Second Generation) SEVIRI (Spinning Enhanced Visible and Infra-Red Imager) measures electromagnetic radiation reflected or emitted from Earth's atmosphere and surface in 11 spectral channels between 0.6 μ m and 14 μ m and one in High Spatial Resolution broad band visible channel every 15 min. Predicting severe weather is one of the ongoing challenges facing meteorologists. The aim of this study is to realize an algorithm able to predict rainfall and solar radiation in the short period. For the nowcasting we have decided to use artificial neural networks because atmospheric phenomena are driven by seven physical laws without any kind of linear relation. So, with this work we would like to predict meteorological phenomena and solar radiation in the short period also because a lot of interests and fields of application move around our target.

Antonio Vocino

Study of the potential information content of the level1 and level2 products of the hyperspectral sounder MTG-IRS for the improvement of the decision support systems based on nowcasting and very short range forecast atmospheric models.

This research aims at investigating the potential of level1 and level 2 products from future EUMETSAT MTG-IRS data in the framework of an operational meteorological centre. In particular, the expected benefits in terms of early detection of potential severe weather systems will be assessed. Innovative concepts and methods in this field - as ANN, PCA and cluster analysis - will be applied within the development of the software for the ground segment data processing running at the Italian Air Force National Meteorological and Climatological Centre. In this introductory presentation the general setup of the research frame will be shown, with particular emphasis on the new approaches proposed in the spatial decision support systems context.

You are cordially invited to attend.

<http://www DISP.unirioma2.it/geoinformation/>