



Università Tor Vergata, Roma
Ingegneria Civile e Ingegneria Informatica

GeoInformation PhD Curriculum

7th 2014 GeoInformation Seminar

DISP meeting room, Ingegneria dell'Informazione, 1 Via del Politecnico
22 May 2014, starting at 15:00

Fabiano Costantini

Potential of advanced SAR interferometric techniques
of Sentinel-1 mission next generation C-band SAR

The project focuses on advanced SAR interferometry techniques and prediction of Sentinel-1 data potential.

Two case studies have been considered: tectonic subsidence in Thessaloniki (Greece) and detection of Etna (Italy) lava flows using Permanent Scatterers (PS) and Small Baselines interferometry (SBAS). Based on the obtained results, a simulation of the forthcoming Sentinel-1 data has been carried out as well as an estimate of the expected performance of the PS calibration module. The SAR speckle tracking has been also tested on the deformation of the Viedma Glacier (Argentina).

Fabiano Costantini received his M.Sc. (Laurea specialistica) degree from Tor Vergata University in 2009. He is completing his GeoInformation Phd program at the same University.

He collaborates with ESA/ESRIN on Earth observation educational activities.

Andrea Gerardi

Dynamic mapping of flood boundaries:
current possibilities offered by Earth Observation Systems and Cellular Automata

Determining the progression of water wave fronts taking account of the surface structure and of the precipitation is a challenging issue in disaster prevention.

The project is based on flooding event simulations through a Cellular Automata (CA) model assimilating the appropriate altimetry and rainfall data. The characteristic accuracy of the model has been tested on a flooding event concerning the Aniene River watercourse. Images taken by the RADARSAT-2 multi-polarization SAR before and after the flood event have been considered to check the results of the CA model in predicting the path of water wave fronts in the stretch of the river.

The information extracted from the SAR images indicates that the developed tool performs rather satisfactorily in estimating the progression of the flood boundaries.

Andrea Gerardi received his MS degree in Computer Engineering from Unisalento University, Lecce, Italy and is currently pursuing the GeoInformation Curriculum Ph.D. degree at the Tor Vergata University.

His research activity involves the development of a software tool for mapping flood boundaries through Cellular Automata and Earth Observation Systems.

Cristina Vittucci

Role of microwave signatures in flooding events and soil moisture monitoring

The project concerns the sensitivity of microwave radiometric systems to rainfall and floods and to soil moisture, under different seasonal conditions and for low to moderate vegetation cover.

A multi-frequency comparative analysis has been carried out on the Bermejo Basin, in Argentina. The results indicate that the brightness temperatures are related to the river water level, so that the radiometric observations show potential in 1- to 7-day flood forecasting. A combined passive optical-microwave approach has been followed on the same subtropical area to estimate leaf and canopy moisture content from several indexes.

The correlation between bio-geophysical parameters and data collected concurrently by L-band airborne radiometer and radar during the SMAPEX-3rd campaign over the Gillenbah Forest (South Australia) has been also investigated. The Tor Vergata microwave scattering and emission unified simulation model, together with specific allometric equations and tree density information, have been the basis for the SMAPEX data interpretation. The results confirm the good performance of radiometric data in soil moisture monitoring.

You are cordially invited to attend.

<http://www.disp.uniroma2.it/geoinformation/>