Università Tor Vergata, Roma

Dipartimento di Informatica, Sistemi e Produzione

GeoInformation Doctorate

Earth Observation Laboratory

Thesis defense (*Esame finale*)

DISP meeting room, Ingegneria dell'Informazione ground floor, Via del Politecnico, 1

10 February 2011, starting at 11:00

Rachid Rahmoune

Validation and extension of microwave emissivity and reflectivity models for forests: application to the ESA SMOS mission

ABSTRACT

The first space-borne L-band mission dedicated to the observation of soil moisture, the European Space Agency Soil Moisture and Ocean Salinity (SMOS) mission, is providing 1.4 GHz radiometric data with global coverage, three-days revisit time and spatial resolution of approximately 40 km. Given the coarse spatial resolution, spatial heterogeneity in land surface conditions exists within the footprints. The SMOS soil moisture retrieval algorithm partially accounts for heterogeneities by modeling microwave emission of different footprint fractions of different land covers.

The main objectives of this research are: (i) to test and improve existing microwave models for the emission from natural surfaces, especially in case of forests; (ii) to investigate the sensitivity of L-band measurements over forests to soil moisture and to below-canopy parameters such as litter and understory biomass. Aircrafts and ground data collected in the course of several campaigns, form an unprecedented data set for investigating passive microwave soil moisture remote sensing techniques, and make this study rather unique in the frame of international research.

Rachid Rahmoune received the B.S. degree in Physics from Hassan II University, Casablanca, Morocco, in 2000, the M.S. degree in Space Systems on Earth Observation, Application to Remote Sensing, from ISUFI, University of Lecce, Italy, in 2002, and has now completed the GeoInformation Ph.D. course at Tor Vergata University, Rome, Italy.

From 2003 to 2007, he was with the Remote Sensing Group, Department of Physics, Polytechnic of Bari, Italy. His activity was focused on monitoring coastal areas and on SAR interferometry for DEM generation and permanent scatterers analysis.

Michele T. Lazzarini

Unsupervised classification of Very High Resolution (VHR) optical images and applications

ABSTRACT

The steady increase of data acquired by EO sensors and of archive sizes demands for new methodologies for information mining. An automatic processing chain reduces human assistance in data analysis and can be designed to retrieve information in Near Real Time (NRT). Both features foster use of EO as source of information for decision-making processes, especially in urban environments, where prompt knowledge of landscape changes is crucial.

This work aims at proposing an innovative methodology to extract information on urban areas automatically from VHR (multispectral and hyperspectral) images by advanced neural networks techniques. The potential of the proposed method has been demonstrated in urban thermographic monitoring.

Michele Lazzarini received his degree in Natural Sciences in 2002 and a Master certificate in Cartography and GIS in 2004 both from the University of Trieste. After getting the MSc in Remote Sensing at University College London in 2007, he joined the Tor Vergata Earth Observation Laboratory towards his PhD in GeoInformation. In 2010 he was a trainee at ESA/ESRIN to support the activities of the Research and Service Support section.

His main research is focused on processing multispectral and hyperspectral images (visible, infrared and thermal), from the pre-processing stage to information extraction for end-users.

You are cordially invited to attend.