

Career Development Plan-Nantes University, May 2008 – October 2010

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Name of Supervisor: **Véronique Carrère**

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BRIEF OVERVIEW OF RESEARCH PROJECT AND MAJOR ACCOMPLISHMENTS EXPECTED:

The initial topic of the project is “Extracting information at the sub-pixel level from Hyperspectral images: determining the mineral composition”. This study will investigate the impact of changes of observation scale on spectral signatures. This can be an important issue while dealing with extracting information of natural surfaces at the sub-pixel level. The objective is to establish a hierarchy of different factors influencing the observed surface reflectance at different scales and develop semi-empirical models.

This study requires empirical measurements, both in the lab and in outdoor conditions. Therefore, it is planned to use laboratory and field collected data and synthetically simulated data. A perfect knowledge of measurement equipment is mandatory, to provide truthful scientific results as well. Also a correct and exact strategy for measurements at various scales of observation should be prepared.

After all data are collected, they should be pre-processed according to basic requirements prior to main data analysis. During the data processing also well-known and innovative algorithms will be used. The newly developed algorithms will be achieved in correspondence with our network partner, involved in this project, and tested on collected data samples.

As a prior stage to the research all knowledge relevant to the subject should be acquired. This requires to be acquainted to existing literature on the subject, participation in courses and exercises.

According to accomplishments, results will be published in papers and presented at conferences.

LONG-TERM CAREER OBJECTIVES (over 5 years):

1. Goals:

- To complete a PhD study with all requirements.
- To publish research results in scientific journals.
- To establish a postdoctoral research, as a continuance of doctoral subject.
- To get grants for further research and activities.
- To organize a research group on remote sensing.
- To apply achieved knowledge in organizations (academic or non academic).
- To teach students.

2. What further research activity or other training is needed to attain these goals?
 - To establish research as planned.
 - To participate in courses and workshops.
 - To use innovated research methods.
 - To get in touch with other network participants and scientists of different institutions.
 - To bring useful research results and try to develop and improve it.
 - To find partners.

SHORT-TERM OBJECTIVES (For the 2.5 years in Nantes University):

1. Research results
 - Anticipated publications:
 - 2-4 papers on hyper-spectral image processing, related to geological data extraction and effects of scale of observations.
 - Anticipated conferences, workshop attendance, courses, and /or seminar presentations:
 - Hyper-I-Net summer school, Wageningen University (WUR), 2008
 - EARSeL-2009 Israel, 19/03/09
 - Hyper-I-Net summer school in 2009
 - Courses in Nantes University: Introduction to petrology, Basics of mineralogy, French language courses. (2009-2010)
 - E-learning courses (TOK):
 1. Hyperspectral un-mixing – State of the art. (IST) – 2h.
 2. Hyperspectral imaging techniques – State of the art approaches and future prospects. (KT) – 2h.
 3. Calibration and characterisation of Hyperspectral cameras. (NEO) – 2h.
 4. Applications of Hyperspectral imaging to geological and coastal environments. (CNRS) – 2h.
 5. Hyperspectral Camera technology. (FFI) – 2h.
2. Research Skills and techniques:
 - Review of publications on research topic.
 - Basic knowledge of geology and mineralogy.
 - Usage of measurement equipment: FTIR spectrometer, ASD, integrated sphere.
 - Methods and algorithms of image processing.
 - Methods of spectral analysis.
 - Scientific writing.
3. Research management:
 - To plan research ahead: measurements, data collection, data simulation, data preparation for analysis.
 - To update strategy according to schedule.
 - To provide progress summary reports at every significant stage of the research:
 - End of 2008 – summary of reviewed literature, research proposal.
 - 2009 – Update report.
 - 2010 – Summary report.

4. Communication skills:
 - French language courses, to be able to participate in academic courses and communicate with colleagues at host university.
 - To improve scientific writing.
 - Communicate with colleagues within the Hyper-I-Net network.
 - Knowledge exchange with network partners.
 - Presentation of own work at conferences and summer schools.

5. Other professional training (course work, teaching activity):
 - Presentation in colloquium or seminar at host university.

6. Anticipated networking opportunities
 - Participation to E-learning courses.
 - Conferences attendance.
 - Participation to HYPER-I-NET activities.
 - Knowledge exchange within the network.


7. Other activities (community, etc) with professional relevance:
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Short schedule of training plans for a period 2008-2010.

2008	2009	2010
French language classes.	Participation to academic courses in host university.	Data processing.
Literature review.	Data collection and preparation.	Observation of primary results.
Getting familiar with equipments.	Field work.	Summary of done work.
Writing research proposal (primary).	Participation to conferences. (as mentioned in section 1)	Preparation for a trip to Portugal.
Attending summer school.	Participation to summer school.	
Contact network partners.	E-learning courses.	
Pilot measurements.	Update report.	

Date & Signature of fellow:

16/05/2008


K. Carmine

Date & Signature of supervisor

16/05/2008


V. CARRIERE