REMOTE SENSING

MODULE OF

REMOTE SENSING DATA ANALYSIS

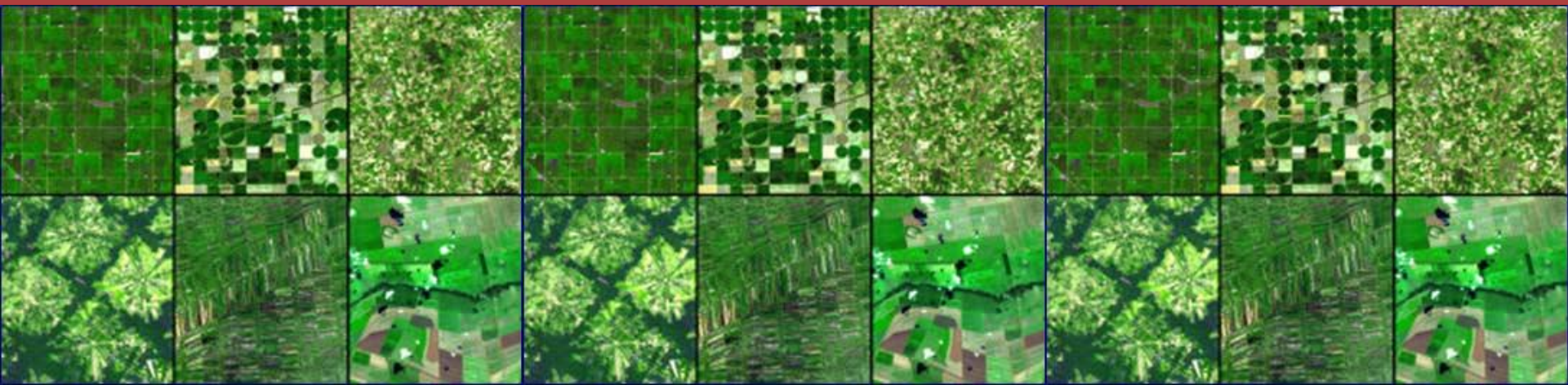
(6 CFU)

A.Y. 2013/14

MASTER OF SCIENCE IN COMMUNICATION TECHNOLOGIES AND MULTIMEDIA

PROF. ALBERTO SIGNORONI

COURSE INTRODUCTION



Who am I?

- This is your teacher
  - Laurea degree Electronic Engineering 1997, PhD Information Engineering 2001
  - From 2002 Assistant and Aggregate Professor of Telecommunications (ING-INF 03)
  - Teaching experience in the fields of Communications Engineering, Analog and Digital Signal Processing, Traffic theory, Laws and Regulations for Information Engineering, Remote Sensing,…
  - Research activity in various fields: Visual Data Compression, Biomedical Image Processing, 3D Computer Vision, Multidimensional Data Analysis, …
  - Family is my preferred implementation of the 3+2 module…

  - Strangely for a man, I don’t like Remote…

… Remote Control and certain kind of terrains…

Remote… Sensing!

- **S1 (17.9 - 21.12.2012): Remote Sensing Data Analysis (6CFU)**
- S2 (18.2 - 7.6 2013): Remote Sensing Data Acquisition (prof. Marco Dalai – 3CFU)

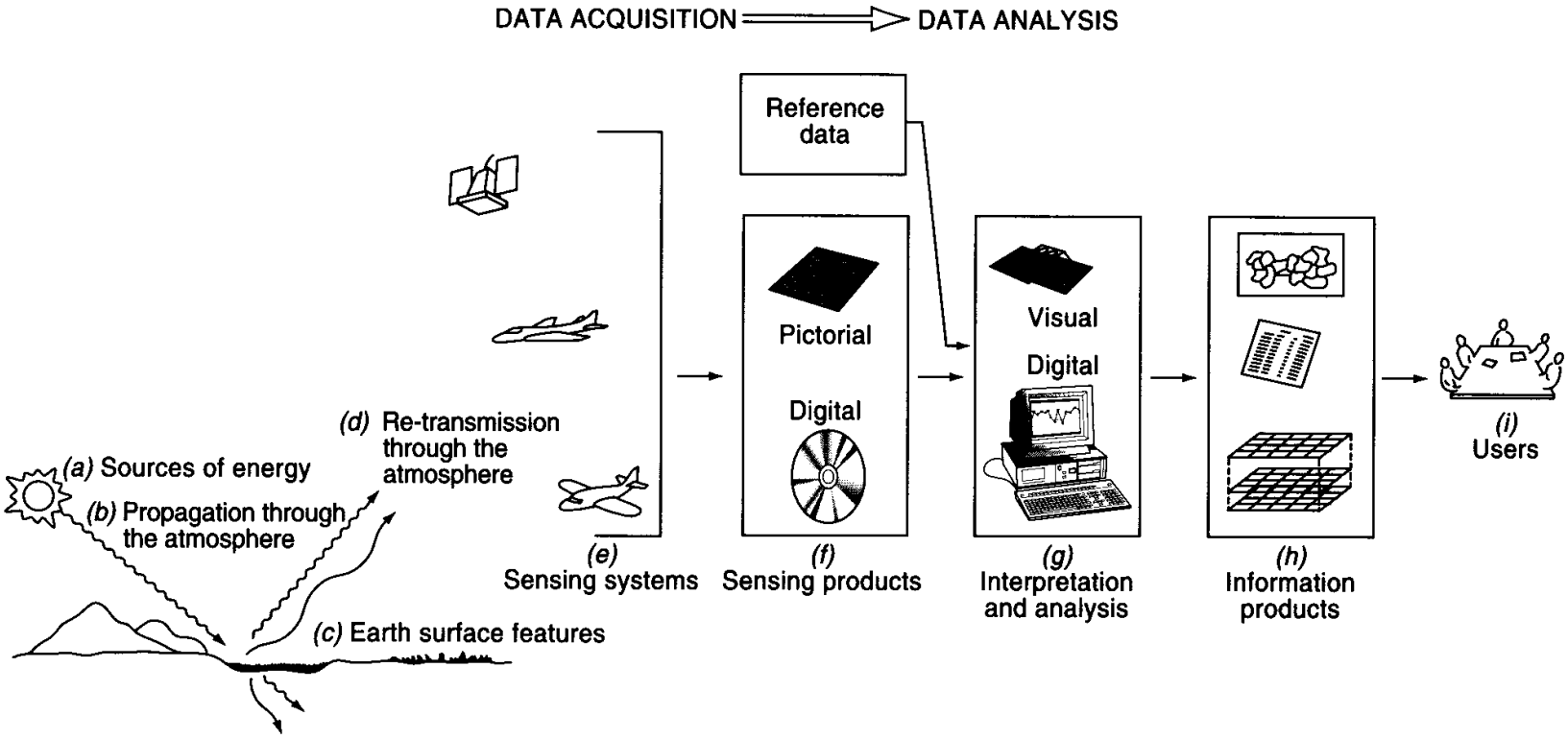


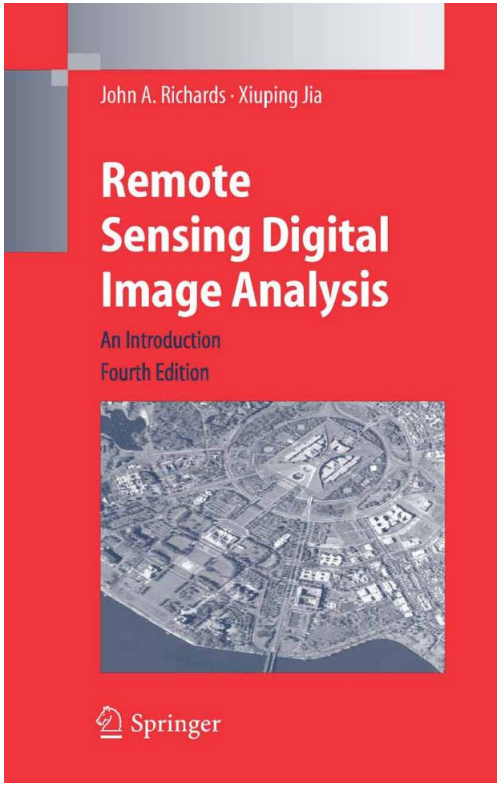
Figure 1.1 Electromagnetic remote sensing of earth resources.

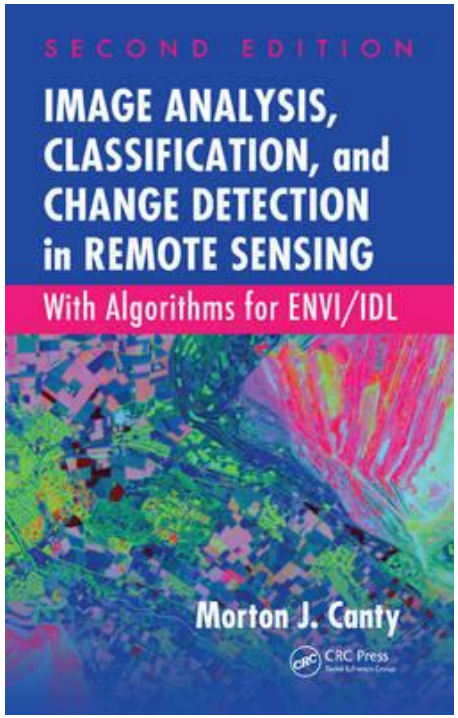
Remote Sensing Data Analysis

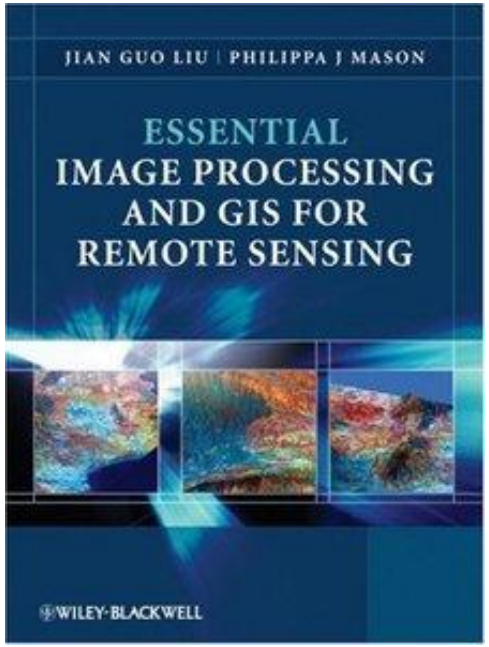
- **Syllabus**
  - Course Introduction
    - Introduction to Remote Sensing Data
    - Introduction to Remote Sensing Platforms
  - Image data error sources and correction
    - Sources of Radiometric Distortion and their Correction
    - Sources of Geometric Distortion and their Correction
    - Remote sensing image registration
  - Multispectral Transforms for Image Data
    - The principal components transform
    - Other multispectral transformations
  - The interpretation of remotely sensed images
    - Human assisted and machine learning approaches
    - Statistical (parametric) supervised image classification
    - Geometric (non parametric) supervised image classification
    - Clustering and unsupervised classification
  - Hyperspectral image analysis and interpretation
- **Laboratory**: image and 3D data processing
- **Reading Groups**: on scientific papers (…if we have time)

Lectures

- Textbooks







Laboratory

Images (aerial, satellite)

MATLAB

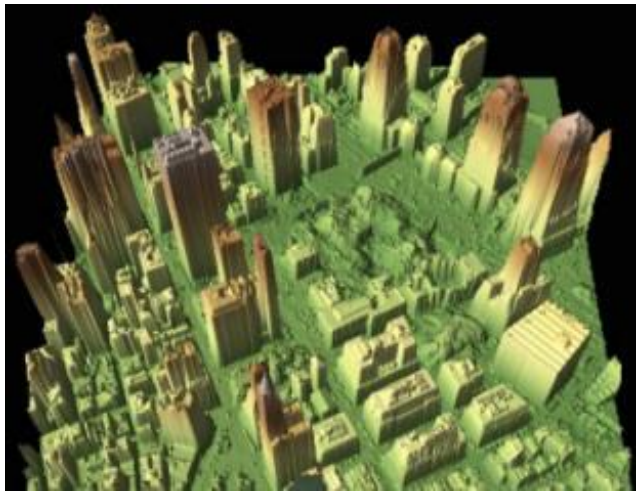
C++
OpenCV

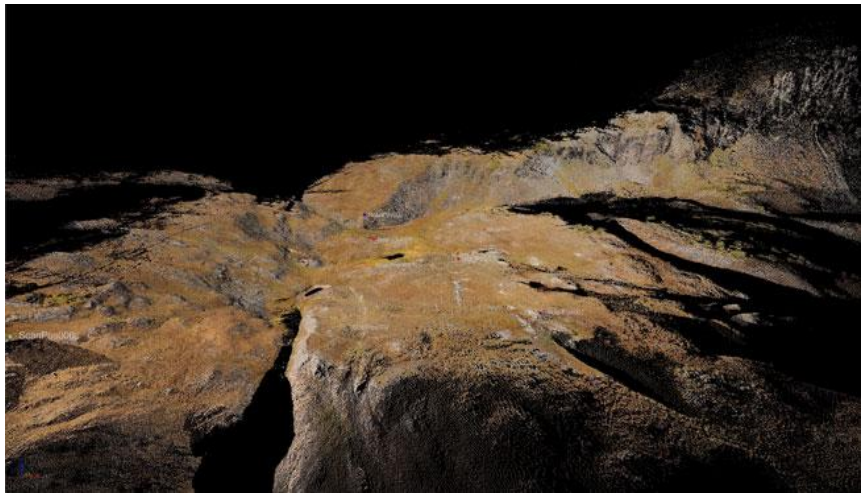
IDL/ENVI

es. rilevamento strade

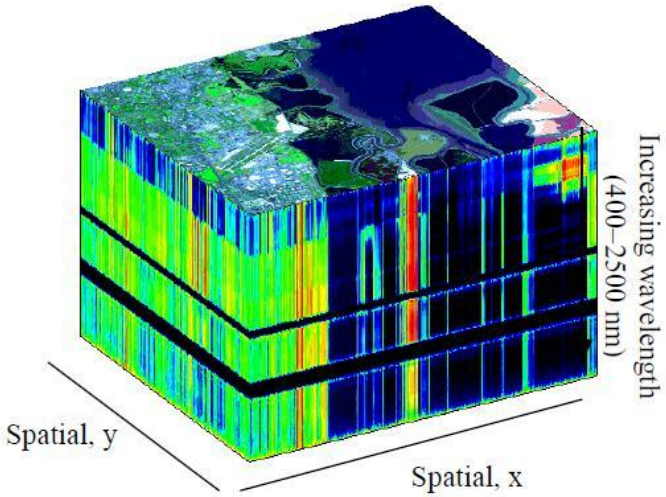
Laboratory (3D datasets)

3D geometric datasets: range images, point clouds, mesh





Hyperspectral datasets



MATLAB
C++
OpenCV
PCL (Point Cloud Library)
http://pointclouds.org/

Other info

- Schedule
  - Monday 10.30-12.30 B.17
  - Tuesday 8.30-10.30 B.lab2
  - Thursday 11.30-13.30 B.18
- Exams
  - Written test + …
- Consulting hours
  - Before, during and after classes is the best time to discuss
  - or, if necessary
    - alberto.signoroni@ing.unibs.it
    - 030 3715 432
    - directly to my office (nr.11, DII)