



AT 76.03
Remote Sensing



by:
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Semester: August

RS&GIS
 School of Advanced Technologies
 Asian Institute of Technology



RS Study in RS&GIS FoS

1. **Remote Sensing (August)**
 Remote Sensing Principles
 Basic Processing
2. **Advanced Remote Sensing (January)**
 1. **Higher Processing**
 Atmospheric Correction, Moderate – Low Resolution RS Processing
 Multi-resolution – Multi-temporal Data, Radar Remote Sensing
 2. **Applications: Modeling**
 Vegetation, Soil Monitoring, Agriculture, Flood
 3. **Web Map Service (Web Image Server) : Implementation**
3. **Digital Image Processing in Remote Sensing(January)**
 1. **Higher Processing Algorithm - Spatial Filtering...**
 2. **Algorithm Implementation in C**
 1. C for Image Processing – For Algorithm Development and Implementation
4. **RS and GIS for Environmental Applications**
 1. Various Application combined with GIS

Rationale

This course aims at providing students with principles of Remote Sensing (RS) technology, which is the tool to obtain information on the earth from deci-meter level to km level locally and globally.

Basic image processing techniques and skill to analyze Remote Sensing image will be taught as well. Application examples of remote sensing technologies to various fields will be introduced to encourage students to use remote sensing in their research

Purpose

1. Understand Principle of RS (What and How We are Looking/Measuring)
2. Understand Various Remote Sensing Satellite System / Data and their Characteristics
3. Understand Advantage and limitation of RS for Applications
4. Understand Basic RS Image Processing Techniques
5. Introduction for higher analysis

Goal

The goals are

1. To be able to use RS for your research as a tool
2. To construct foundation for RS research
3. Entry point to be a RS engineer / researcher
4. To be able to operate ENVI software, but not as a black box
 - Understand what is going on (algorithm) behind very user friendly interface.
 - By doing so, you will be able to operate another software easily
 - Being able to select menus does not mean having understood RS !
5. To obtain the analytical attitude to look at the essence of phenomena.
 - RS is just a tool for observation !
 - Understand a phenomena on the ground.
 - How this phenomena would appear in RS Image under the limited observation condition (wavelength, spatial&time resolution) and vice versa.
 - To establish a relationship between what we want to know and RS data

Course Outline

1. Introduction
2. Overview of RS Application
3. Interaction between electromagnetic wave and targets
4. Satellite System and Sensors
5. Introduction to RS Digital Image Processing
6. Image Enhancement
7. Geometric Correction
8. RS Image Classification
9. Introduction for Modeling

Text Books / References

- ◆ Lecture Note
- ◆ Remote Sensing Note
 - Japan Association on Remote Sensing
- ◆ *R.C. Gonzales, R. E. Woods:*
Digital Image Processing, Addison Wesley, 1993
- ◆ *R. A. Schowengerdt:*
Techniques for Image Processing and Classification in Remote Sensing, Academic Press, 1983
- ◆ *John A. Richards:*
Remote Sensing Digital Image Analysis, Springer-Verlag, 1993
- ◆ International Journal of Photogrammetry and Remote Sensing; (ISPRS)
- ◆ Photogrammetric Engineering and Remote Sensing
- ◆ Asian Journal of Geoinformatics

Lecture Note, Remote Sensing Note and Labo materials are available from

- <http://www.rsgis.ait.ac.th/~honda>
- <http://203.159.10.13/>
- dellserv@public.honda

Grading System

Final grades will be computed according to the following percentage distribution:

- ◆ Mid-semester Examination 30%
- ◆ Final Examination 40%
- ◆ Assignments / Lab Assignments / Mini Project 30%.

Examination will be closed book

Profile of HONDA

- Date of Birth 18/MAR/1959
- Nationality JAPAN
- 1982 Tokyo University/ Forestry
- 1982 Nippon Koei Co., Ltd. ,
Disaster Prevention Section
 - Land Slide(Disaster, Prediction)
 - Erosion Control Planning
 - Supervisor of Construction
- 1985 Mie University
- 1993 D. Eng. Tokyo Univ.
(Evaluation of the vegetation change in Asio Copper mine using Remote Sensing)
- 1995 AIT
- NOAA/AVHRR(1997)
- 1997 ACRORS Establishment
 - MODIS establishment(2000)
- Application of RS for Erosion Control
- <http://www.rsgis.ait.ac.th/~honda>
- Current Research Topic Interest
 - Web GIS
 - Data Assimilation for Crop Modeling/Monitoring
 - Real Time Mapping (Volcano, Buildings)
 - Debris Flow Simulation