



12<sup>th</sup> ISPRS Student Consortium & WG

VI/5 Summer School

Nay Pyi Taw, Myanmar

1-5 Nov, 2014

# Report

## Geospatial Technology for Environmental Management and Monitoring

1 - 5 November 2014, University of Forestry, Nay Pyi Taw, Myanmar



**ORGANISER AND SUPPORT STAFF  
OF THE ISPRS STUDENT CONSORTIUM AND WG VI/5  
SUMMER SCHOOL**

**Sponsor:**

International Society for Photogrammetry and Remote Sensing - ISPRS

Asian Association on Remote Sensing - AARS

Geospatial Information Agency - BIG

**Organisers:**

ISPRS Student Consortium

Asian Association on Remote Sensing

Geospatial Information Agency (GIA/BIG)

## INTRODUCTION

Continuing the very successful tradition of the previous summer school started by the ISPRS Student Consortium in 2005, ACRS 2014 also hold the “12<sup>th</sup> Student Consortium and WG VI/5 Summer School “at the Yezin, Nay Pyi Taw, Myanmar during November 1-5, 2014 at University of Forestry.

The primary objective of this summer school was to improve technical knowledge, strengthen and expand social networks. The theme of the 12th Summer School is “Geospatial Technology for Environmental Management and Monitoring” and the overall program is illustrated in the figure below.

| Time        | 1 Nov 2014 (Saturday) | 2 Nov 2014 (Sunday) | 3 Nov 2014 (Monday)                 | 4 Nov 2014 (Tuesday) | 5 Nov 2014 (Wednesday) | 6 Nov 2014 (Thursday)      |
|-------------|-----------------------|---------------------|-------------------------------------|----------------------|------------------------|----------------------------|
| 05:30-06:15 |                       | Morning Exercise    |                                     | Morning Exercise     |                        |                            |
| 06:15:07:00 | Breakfast             |                     |                                     |                      |                        |                            |
| 07:00-08:00 | walking exercise      | walking exercise    | Field Trip (Nay Pyi Taw Hot Spring) | walking exercise     | walking exercise       | Check out & Optional event |
| 08:00-10:00 | Session 1             | Session 5           |                                     | Session 9            | Session 13             |                            |
| 10:00-10:15 |                       |                     |                                     |                      |                        |                            |
| 10:15-12:00 | Session 2             | Session 6           |                                     | Session 10           | Session 14             |                            |
| 12:00-13:00 |                       |                     |                                     |                      |                        |                            |
| 13:00-14:45 | Session 3             | Session 7           | Field Trip (Nay Pyi Taw Hot Spring) | Session 11           | Session 15             |                            |
| 14:45-15:00 |                       |                     |                                     |                      |                        |                            |
| 15:00-17:00 | Session 4             | Session 8           |                                     | Session 12           | Session 16             |                            |
| 17:00-18:00 | play chin lone        | play chin lone      |                                     | play chin lone       | Closing Ceremony       |                            |
| 18:00-19:00 | Dinner                | Dinner              | play chin lone                      | Dinner               | play chin lone         |                            |
| 19:00-21:00 | Free activities       |                     | Dinner                              |                      | Dinner                 |                            |
| 21:00-22:00 |                       | Free activities     | Free activities                     | Free activities      | Cultural Night         |                            |

Legend

| Theory and Handon                           | Physical refreshment   | Social Event | Free activities | Ceremonies |
|---|--|--------------|-----------------|------------|
| Session 1, Forest Uni. Rector               | Welcome Speech   |              |                 |            |
| Session 2, Prof. Chen Jun (ISPRS-President) | Global Land Cover 30m  |              |                 |            |
| Session 3~4 Dr. Manos                       | (1) Recent Technological Advancements and Research Trends in Photogrammetry and Remote Sensing   |              |                 |            |
|   | (2) Full-automated nationwide classification of tree species by combining airborne digital sensor data and NFI sample plots  |              |                 |            |
|   | (3) Modeling of Gravel Pits based on UAV Imagery   |              |                 |            |
|   | (4) 3D modeling and visualization of cultural heritage sites from high-resolution satellite imagery  |              |                 |            |
|   | (5) Extraction of tree parameters using high-resolution DSMs/DTMs and airborne imagery   |              |                 |            |
| Session 5~8, Dr. Martin                     | LiDAR processing (together with Hand-on) course  |              |                 |            |
| Session 9~12, Dr. Moe Myint                 | (1) Application of Geo informatics for Designing National forest Inventory (NFI) Systems and Forest Resources Potential Assessment (FRPA)  |              |                 |            |
|   | (2) Stratification of land cover, land use and forest types using RemoteSensing and GIS  |              |                 |            |
|   | (3) Statistics Sampling theory for designing the sampling intensity and Sample plots for NFI and FRPA in order to obtain desire %margin of error within the limited  |              |                 |            |
|   | (4) Designing field data collection system (paperless) using GPS system (We collect location and attributes of all individual trees within all sample plots throughout the country using paperless data collection system using Trimble GPS) |              |                 |            |
|   | (5) Geo-database design for NFI and FRPA system using RDBMS and GIS server   |              |                 |            |
|   | (6) R Statistics for analyzing and producing results and reporting   |              |                 |            |
|   | (7) Future direction   |              |                 |            |
| Session 13~16, Dr. Soe Win Myint            | (1) Spatial configuration of detailed land cover features on urban warming effect  |              |                 |            |
|   | (2) Land use land cover change with regards to regional climate change using a numerical modeling approach   |              |                 |            |
|   | (3) Urbanization and heat island effect  |              |                 |            |
|   | (4) Crop type mapping and evapotranspiration modeling for agriculture water use in response to drought   |              |                 |            |

## LECTURERS OF THE SUMMER SCHOOL 2014

### 1. Prof. Dr. Chen Jun

**Topic: Global Land Cover 30m**



Chen Jun received his education on photogrammetry and remote sensing in both China and France. He became an associate professor in 1987 and full professor in 1992 in Wuhan University. In 1995, he joined National Geomatics Center of China (NGCC), and served as the NGCC president from 2000 to 2009. He is now chief scientist of NGCC.

He has led a number of key research and operational projects in the field of geo-information, including global land cover mapping at 30 meter resolution, updating of national databases at 1:50,000 scales, mapping Ming Great Wall with remote sensing, dynamic and multi-dimensional data modeling, and service-oriented dynamic geo-computing. He has developed Voronoi-based 9-intersection model, spectral gradient-based change detection algorithm, et.al, and published more than 100 journal papers. Since 1993, he has supervised more than 40 PhD students.

Chen Jun has been active in both national and international societies. He was the president of China Association of GIS from 1999-2011. He has served the International Society of Photogrammetry and Remote Sensing ISPRS since 1996 and is now ISPRS president (2012-2016). He is also a member of the editorial board of International Journal of Geographic Information Sciences (IJGIS) and ISPRS Journal of Geo-information Sciences.

## 2. Prof. Emmanuel Baltsavias

### Topic: Photogrammetry and Remote Sensing



#### Curriculum Vitae

- **1975-1981:** Dipl. Eng., School of Rural and Surveying Eng., National Technical University of Athens, Greece
- **1981-1982:** Independent work as surveying engineer
- **1982-1984:** MSc. in digital photogrammetry (topic digital image correlation), Dept. of Geodetic Eng., Ohio State University (OSU), Columbus, OH, USA
- **1982-1984:** Teaching and research assistant at the Dept. of Mathematics and Geodetic Eng. OSU, project on image correlation with the company Helava Assoc. Inc.
- **1984-1991:** PhD on multiphoto geometrically constrained matching at the Institute of Geodesy and Photogrammetry, ETH Zurich
- **Since 1984:** with the Institute of Geodesy and Photogrammetry, ETH Zurich at various positions as PhD student, assistant, Oberassistent, scientific adjunct, “Dozent” and senior scientist. Participation in various EU, international and Swiss projects with academia, public and research agencies and private companies.

#### Research area

- Photogrammetry
- Remote Sensing
- Image Analysis And Object Extraction
- Spatial Data Quality And Data Fusion

#### Teaching area

- Optical Remote Sensing
- Airborne Laser Scanning
- Signal And Image Processing
- Photogrammetry

### 3. Dr. Martin Isenburg

**Topic: LAsTools**



**Dr. Isenburg** received his PhD in 2004 from UNC Chapel Hill. He was first exposed to LiDAR as a post-doc at UC Berkeley constructing seamless Delaunay triangulations for billions of points. Dr. Isenburg specializes in geometry processing and data visualization with a focus on large LiDAR point clouds. Currently, he is an independent scientist maintaining a popular suite of LiDAR processing software called LAsTools. Dr. Isenburg is a vocal advocate of open LiDAR formats. He is a member of the LAS Working Group and provides the open-source LASzip compressor. His company rapid lasso GmbH licenses the popular LAsTools LiDAR processing software that is widely known for its blazing speeds and high productivity. Combining robust algorithms with efficient I/O and clever memory management LAsTools achieve high throughput for data sets containing billions of points. The suite is heavily used in the commercial sector, government agencies, research labs, and educational institutions alike – filtering, tiling, rasterizing, triangulating, converting, clipping, quality-checking, TeraBytes of LiDAR every day.

#### **4. Dr. Moe Myint**



Dr. Moe had graduated in Forestry in 1986 and worked for three years at Forest Department in Myanmar until 1989. And studied Master of Forestry (M.F) at - Yale University School of Forestry and Environmental Studies (Yale FES). He continued his further studies at Asian Institute of Technology for M.Sc and Ph.D He worked as a GIS Specialist for three years at ICIMOD in 1997-2000. And he is currently serving as a Senior Technical Advisor to Bhutan Government for sustainable management of forest resources and national development planning from 1997-Present

In parallel, he also work as GIS Coordinator and Scientific Collaborator at University of Fribourg, Switzerland from 2000-2007. And also a Research Scientist and Faculty member at Yale University School of Forestry and Environmental Studies (Yale FES) from 2007-2015

And also a Chief Scientist at Mapping and Natural Resources Information Integration (MNRII) in Switzerland since 2013 to Present and affiliated to University of Bern in Switzerland.



## **Dr. Soe Win Myint**



Dr. Soe W. Myint is a full Professor in the School of Geographical Sciences and Urban Planning at Arizona State University (ASU) and has over 20 years of experience in remote sensing, GIS, geospatial statistics, spatial modeling, and geospatial classification algorithm development in an effort to inform our understanding of land cover land use (LCLU) change and simulation, drought, land degradation, desertification, agriculture water use, disaster management, assessment, and mitigation, land configuration, regional climate change; urban environmental modeling, assessment of deforestation and forest degradation, and coastal zone mapping. He has spent four years in the United Nations Environment Program – Environment Assessment Program for Asia and the Pacific (UNEP/EAP-AP), formerly known as UNEP GRID, Bangkok as Research Specialist from 1995 to 1998. Dr. Myint has served as President of the American Society for Photogrammetry and Remote Sensing-Southwest U.S. Region and Chair of the Remote Sensing Specialty Group, Association of American Geographers. He is currently serving as Lead PI of three funded projects— (1) NASA project titled Understanding Impacts of Desert Urbanization on Climate and Surrounding Environments to Foster Sustainable Cities Using Remote Sensing and Numerical Modeling; (2) NOAA project titled Evaluation of Drought Risks and its Impact on Agricultural Land and Water Use to Support Adaptive Decision-making; and (3) NSF project titled Wavelet Analysis of High Spatial Resolution Imagery for Urban Mapping Using Infinite Scale Decomposition Techniques. He has been actively involved in or affiliated with GeoDa Center for Geospatial Analysis and Computation, Central Arizona Phoenix – Long Term Ecological Research (CAP-LTER), Decision Center for a Desert City (DCDC), and Urbanization and Global Environmental Change (UGEC) Project. He is currently serving as Senior Sustainability Scientist at the Julie Ann Wrigley Global Institute of Sustainability and Co-Director of Environmental Remote Sensing and Geoinformatics Lab at ASU.

**University of Forestry (ko tin aung moe)**

## PARTICIPANTS

The number of participants reached 43 who came from 5 different countries and among them; the number of observers are 13. It consists of 25 male participants and 18 female participants. The detailed information on participants is listed in the Table below.

| <b>Nationality</b> | <b>Number</b> |
|--------------------|---------------|
| Phillipines        | 4             |
| Indonesia          | 3             |
| Myanmar            | 34            |
| Thailand           | 1             |
| Vietnam            | 1             |
| <b>Total</b>       | <b>43</b>     |

| <b>Age</b>   | <b>No. of Participants</b> |
|--------------|----------------------------|
| < 21         | 3                          |
| 21 -30       | 28                         |
| 31- 40       | 8                          |
| > 40         | 4                          |
| <b>Total</b> | <b>43</b>                  |

| <b>Education</b> | <b>No. of Participants</b> |
|------------------|----------------------------|
| Bachelor         | 28                         |
| Master           | 12                         |
| PhD              | 3                          |
| <b>Total</b>     | <b>43</b>                  |

| <b>Sex</b>   | <b>No. of Participants</b> |
|--------------|----------------------------|
| Male         | 25                         |
| Female       | 18                         |
| <b>Total</b> | <b>43</b>                  |

## **SUMMER SCHOOL PROGRAMME**

More than 30 participants arrived at the University of Forestry by the shuttle bus from the ACRS Venue in Convention Center in Nay Pyi Taw. There are also more than 13 persons attending this summer school as observers at Yesin. The registration began in the evening of November 26. The opening ceremony started at 9:00 AM in Lecture Room of University of Forestry. Prof. Kohei Cho (AARS Secretary General), Prof. Chen Jun (ISPRS-President), and Prof. Myint Oo (Rector –University of Forestry) spoke welcome speech to participants. And then The 12th Student Consortium and WG VI/5 Summer School were officially opened. Moreover, Prof. Emmanuel Baltsavias and Dr. Martin Isenburg also gave the brief presentation about ISPRS Student Consortium. The main purpose of the SC is to link students, young researchers and professionals in different countries, who are interested in the photogrammetry, remote sensing and spatial information sciences, to provide a platform for exchange of information, to organize student-specific events and other actions that integrate students and youth more effectively into ISPRS activities. The welcome dinner was held at the same day. This dinner was the first communication among student participants and also the lecturers of the summer school.



The official banner of 9<sup>th</sup> Student Consortium and WG VI/5 Summer School



Opening Ceremony



Prof. Chen Jun in the Opening Ceremony



Dr. Martin Isenburg in the Opening Ceremony



Prof. Emmanuel Baltasvias in the Opening Ceremony



Prof. Dr. Myint Oo in the Opening Ceremony



Welcome Dinner



Welcome Dinner

Within 12th Student Consortium and WG VI/5 Summer School, two professors and two post doctor shared their knowledge and experience of remote sensing and GIS technology with the participants. Prof. Chen Jun gave the lecturer about Global Land Cover 30m after welcome speech and Prof. Emmanuel Baltsavias continue the rest day with his lecture. Then the practical session is guided by Dr. Martin Isenburg. He introduced how to use LAsTools to implement a pipeline that (1) quality checks a newly received set of raw LiDAR flight strips, (2) tiles and prepares the LiDAR for subsequent exploitation, and (3) generates raster and vector derivatives such as DTMs, DSMs, building footprints, and iso-contours with multi-core batch processing. Dr. Moe Myint aslo shared his experience about “Multinomial Logistics Regression for Digital Image Classification” with lecture and practical. Dr. Soe Win Myint explained his experience and knowledge on urban warming effect and climate change.



Lectures by Prof. Chen Jun



Lectures by Dr. Martin Isenburg



Going to Lecture Theater



Lectures by Dr. Myint Oo



Lectures by Dr. Soe Win Myint

In the middle of the Summer School, the local host arranged the one day tour to Safari and Zoological garden, Nay Pyi Taw.

### **Safari and Zoological garden**

The Safari Park (Nay Pyi Taw) is located beside the Yangon- Mandalay High way and about 20 mile far from Nay Pyi Taw down town. It is established in 2010 and successfully open on 12 th Feb 2011. It has an area of 291.52 acres and the area was selected based on natural tree compositions, topography and stand structure which are adaptable for wild animals as well as easily accessible for public. All participant were taken care by authorized persons from this garden and gave the patiently explanation about the animals while looking around the zoo. All participants got the wonderful time and knowledge about the wild life animals.



Field trip to Safari and Zoological garden





Field trip to Safari and Zoological garden



Playing Game

## CONCLUSIONS

The lecture material is available online at <http://www.isprs-sc.org/materials/>. All participants got valuable knowledge during the lectures and the network has been successfully established in the 12th ISPRS SC Summer School. The local organizer already make the email group of 12th ISPRS SC Summer School's participants to provides opportunities to get to know each other, to share information and stories for all participants, to pursue a particular interest, or just to have fun.