GIS-IDEAS 2018 Training Workshop Program for 22nd November 2018

As a part of GIS-IDEAS 2018, the following training workshops are scheduled to be conducted at lecture halls at the conference venue shown below. Upon successful completion of the Workshop, the participants will receive certificates awarded by the Japan-Vietnam Geoinformatics Consortium. All the workshops will be in lecture styles with the trainers providing explanation and demos. The participants will be provided with hands on material software and sample datasets for self-paced learning after attending the workshops.

Venue: Can Tho University

Learning Resource Center

Campus 2, 3/2 Street, Xuan Khanh Ward, Ninh Kieu District, Can Tho, S.R. Vietnam

Fee: One workshop registration could be free (included in the registration fee) and the second WS could be charged 50USD (for overseas) and 25USD for host country participants

(Fee can be paid at the Registration Desk in US dollars or equivalent amount in Vietnamese Dong at 8:00- 9:00 22 November 2018)

Participants wishing to attend the training should register in advance by sending by e-mail to the GISIDEAS Secretariat at gisideas.secretary@gmail.com. Please indicate "Registration for GIS-IDEAS 2018 Training Workshop" in the subject of your e-mail and include following details:

- Name and Affiliation (Name of Institution/Company and Position)
- Name of Training workshop you wish to register

Training will be on first-come-first-serve basis and registration will close on 16 November 2018 (Friday). All workshops will be conducted in English with some instructions in Vietnamese when necessary.

WS1: *Analyzing time-series data for monitoring vegetation seasonality using TIMESAT*

Date: 9:00 - 12:30 22th November 2018.

Phenology is considered as the key for tracking the changes in the ecology of species in response to climate change. In recent year, the remote sensing data are widely used in phenology topic because it could monitor in both temporal and spatial characteristics, which are very important for the research of plant phenology. This workshop introduces about how to use TIMESAT for analyzing time-series data for evaluating and estimating the seasonality parameters as well as the shifting of vegetation phenological metrics. The content of workshop is as following:

- Introduction about TIMESAT: authors and applications,
- Program and processing overview,
- Getting started with TIMESAT
    + Preparing the data (Ex: time series of MODIS NDVI).
    + Explore time-series data and fine tune the settings (Controlling the processing: input setting).
    + Pre-processing to remove spikes and outliers.
    + Extraction of seasonality parameters.
    + Working with output data.
- Case study: Evaluating the shifting in growing season of tropical deciduous forest.

Expect output: the participants understand how to control the input remove noise in time series data in TIMESAT, and extract 11 seasonality parameters.

Lecturer: Phan Kieu Diem

Participants: Maximum 20

Language: English/ Vietnamese

WS2: *Field Data Aggregation using Citizens and Sensors*

Date: 9:00 - 12:30 22th November 2018.

Contents: This workshop aims at presenting the use of Mobile GIS applications for collecting and further visualization of data. The workshop starts with an introduction to Open Source software in GIS FOSS4G tools. The workshop will focus on the details of installing and using field data collection applications running on Android devices.
It will equip participants with tools & skills to leverage mobiles for data collection and its visualization for a variety of societal needs related to management of natural resources, disaster mitigation, public health, asset/facility management and environmental monitoring.

This workshop is specifically designed for people/organizations who involved in field data collection and analysis. Anyone who is in collection of geo-referenced field and its analysis will benefit from this workshop. Techniques taught in this workshop can be used for in any field - marketing, demographic surveys, management of natural sources, disaster mitigation, public health, asset/facility management and environmental monitoring. Deep knowledge of computer programming is not a pre-requisite. Participants must be able to use an Android device and bring their Android device with ODK Collect [1] [2] pre-installed. Demonstration of integrating field data with GIS will be shown using OSGeo-Live [3] based Virtual Machine [VM]. Demo server will be available during the workshop to upload, visualize and download the field data in popular GIS data formats (KML, CSV, Shape file).

While this is not a must for all participants, those who are interested in deploying their own ODK Aggregate Server can try their hand on installing the server side package during the workshop. Participants wishing to try out the server installation must bring their own laptop with latest version of Oracle Virtual Box [4] pre-installed. The requirement for smoothly running the VM include 4GM RAM, at least 30GB hardisk space. Pre-packaged Linux-based VM is platform independent. However, the instructions and demonstrations will be carried out on MS-Windows 10 based machine.

Digital copies of workshop material including handouts and software will be provided to the participants.

[1] https://play.google.com/store/apps/details?id=org.odk.collect.android&hl=en
[2] https://opendatakit.org/downloads/download-info/odk-collect-apk/
[3] https://live.osgeo.org/en/index.html
[4] https://www.virtualbox.org/wiki/Downloads

Lectures: Sittichai Choosumrong and Venkatesh Raghavan

Participants: Maximum 25

Language: English

WS3: *Introduction to QGIS*

Date: 9:00 - 12:30 22th November 2018.

QGIS is an open-source desktop GIS tool that helps you manage, edit, visualize, analyze, and compose maps with geographic data. The workshop will provide introduction to QGIS features and functions. Participants will also be provided with a full working version of the latest QGIS release (qgis.osgeo.org) and hand-on exposure for installing/using QGIS on MS-Windows Operating system.

Lecturer: Pham Thi Mai Thy

Participants: Maximum 30

Language: English/ Vietnamese

WS4: *Learning VBA ArcObjects and Python Programming in ArcGIS*

Date: 13:30 - 17:00 22th November 2018.

Description of Workshop: Conduct lecture and computer hands-on exercises on Visual Basic Application (VBA) ArcObjects and introduction on Python programming in developing toolbox. VBA installer and e-book manual with data will be provided

Pre-requisites for attending the workshop: Moderate knowledge using ArcGIS 9.* or higher version.

Demo Style: Combine lecture and hands-on exercises using VBA ArcObject and python programming. Bring your own laptop with pre-installed ArcGIS 9.*, 10.* or higher version with free space of 10 GB or higher;

Lecturer: Carlos Pascual

Participants: Maximum 30

Language: English

WS5: *Theory and Practice of Deep Learning for Large-scale Geospatial Data*

Date: 13:30 - 17:00 22th November 2018.

Data-driven science and machine-learning techniques are becoming increasingly important. In particular, deep learning has proven to be a major breakthrough and an extremely powerful tool in many fields. This workshop aims mainly to introduce deep learning techniques for Geospatial data application. This workshop eventually helps the participants to create their desired deep learning architectures and also to modify the functions such as activation function, loss function, optimizer, etc., of the existing deep learning models. We will use the Jupyter Notebook to follow the workshop tutorial and also to perform interactive exercises. Basic concept of deep learning and how it can be useful in large scale geospatial data exploration will be explained in the tutorial.

Data preparation is key and a basic operation when large size spatial data are used for deep learning exercise. Therefore, several techniques such as cropping to small sizes, patching, class balancing, normalization and augmentation for data preparation which are commonly used in deep learning will be demonstrated. Workshop mainly demonstrates binary segmentation, multiclass segmentation and object detection using Open remote sensing high resolution images. State-of-the-art Multi-Layer Perceptron (MLP) deep learning and Convolution Neural Network (CNN)

such as U-Net and ResNet will be used for exercise. Workshop will also demonstrate a common challenge in deep learning known as over-fitting and will show how to address this issue by various techniques such as dropout, regulizer, learning rate decay, etc.

We are using Open source and Open data for the workshop therefore precipitance can have the dataset for their future exercises. Python based famous machine learning frameworks Keras and Pytorch will be used in the workshop. Keras and Pytorch are selected since these are two of the fastest growing open source platforms and relatively user-friendly. Mainly three data sets such as Road and Building detection (Binary), ISPRS data-set (Multiclass), DOTA-v1.0 aerial images (Object detection).

Targeted participants and prerequisites: This workshop aimed at students, researchers, and other people who would like to apply deep learning for their GIS and Remote Sensing related applications. Beginners in machine learning and deep learning are invited for the workshop. Workshop will be carried out using Jupyter Notebook,and hence, people with a limited python knowledge also can attend. Participants are requested to carry a laptop.

Lectures: PoliyapramVinayaraj and Ryuhei Hamaguchi

Participants: Maximum 25

Language: English

WS6: *User's guide for the LSE program supporting agricultural land use planning at regional scale*

Date: 13:30 - 17:00 22th November 2018.

The land suitability evaluation (LSE) is software developed by the lecturers that is supporting for agricultural land use planning at regional scale. LSE is developed based on the GIS multi-criteria analysis and land suitability assessment procedure, which allows people identifying accurately, timely the most suitable lands for a crop including the growth, development, socio-economic impact, and environmental effect mitigation. The participants will learn how to carry out steps in evaluating land suitability: (1) defining criteria and data, (2) calculating the standardized data, (3) weighting selected criteria, (4) classifying the partial performance indices, (5) evaluating land suitability. Additionally, usage of supporting tools in the software also introduce in the workshop. After this course, the participants can get skills on the usages of LSE and may have ideas for their researches related to land evaluation in the future.

Content of WS:

- Briefly description on the LSE software
- Guiding steps in evaluating land suitability for a case study of rubber in Quang Tri province
+ Embedding the supporting tools during implementing the evaluation
+ The specific steps

Lecturers: Nguyen Thanh Tuan and Ngo Dang Tri

Participants: Maximum 25

Language: English/ Vietnamese