



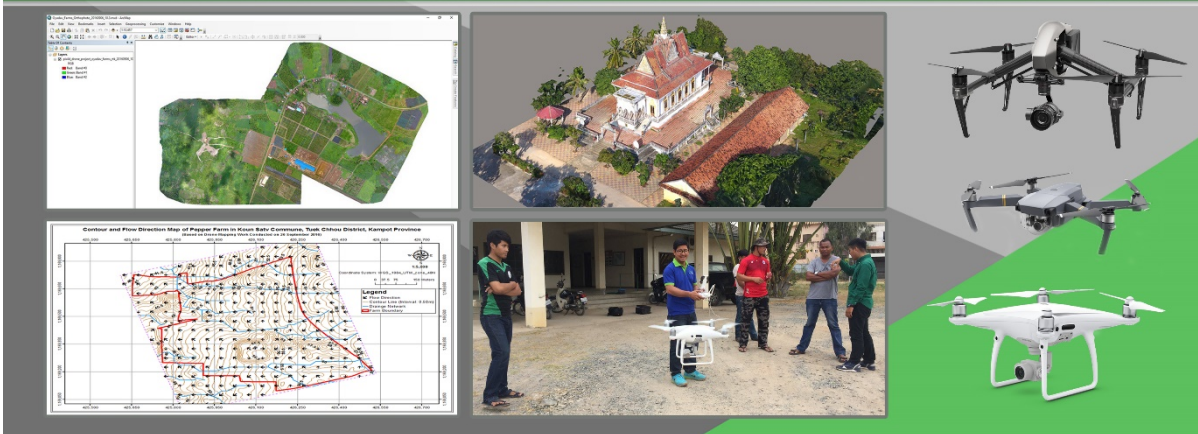
Training on: Aerial Mapping and 3D Modeling with DJI Drones

I. Introduction

Drones provide a fast and easy means of capturing images of natural and man-made land-based features and areas that may be difficult to access or fully covered because of its size or terrain. Surveying drones such as eBee from senseFly costs over 30,000 USD and it is not affordable for most of the GIS and mapping projects. However, due to recent advancement in modern photogrammetry, it is now possible to turn your consumer drones such as those from DJI into a professional mapping and 3D modeling tool. DJI Phantom 3 Professional and Phantom 4 which cost less than 2,000 USD for a complete mapping unit have become a very popular choice for aerial mapping and 3D modeling work.



Training on: Aerial Mapping and 3D Modeling with DJI Drones



The main purpose of this training is to introduce participants to fundamental concepts of modern photogrammetry, how to make flight plans for capturing appropriate images with DJI drones, and how to use the most popular and advanced photogrammetry software (Pix4Dmapper Pro) to create dense point cloud, orthomosaic, digital surface model (DSM), digital terrain model (DTM), contour lines, and 3D textured mesh from those drone images.





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The followings are the key topics to be presented and discussed during the training:

- Introduction to modern photogrammetry
- Flight plans: Aerial nadir and oblique
- Understanding ground control points (GCPs)
- Understanding DJI drones and other popular drones
- Applications of aerial mapping and 3D modeling
- Working with DJI GO app
- Working with DJI mapping and 3D modelling apps
- Processing captured images with Pix4Dmapper Pro software:
 - Getting started with your first project
 - Including GCPs in the project
 - Understanding the Quality Report
 - Making measurements
 - Creating video animation
- Generating DTM from Point Cloud with LASTOOLS
- Creating contour lines from DTM in ArcMap
- Working with drone mapping outputs in ArcMap

II. About the training

- Trainer: **Mr. LA Vaha**
- Venue: Near Psar Dey Houy and along Hanoi street (see this map in this link: <https://goo.gl/maps/i4ochFg82WL2>)
- Date and time: 7th – 11th August 2017
- Fee: 1,499 USD per participant
- Training manual: English language
- Prerequisite: Participants should have basic knowledge of how to use GIS software, such as ArcGIS or QGIS, and they should be able read some common English words. Participant should also have their own computer laptops and DJI Phantom drones.

III. About the trainer

Mr. LA Vaha will be the key trainer of this course. He has completed Master of Spatial Information Science from the University of Melbourne, Australia and had extensive work experiences as GIS Specialist for different projects. He is currently the Managing Director of EZ Surveying Co., Ltd and also National Consultant for FFI, FAO, UNDP, and MRC.





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He has been the freelance GIS trainer of the following GIS courses:

- Learning Basics of ArcGIS® Desktop 10
- Learning Advanced ArcGIS® Desktop 10 Series: Geodatabase Development and Management
- Spatial Analysis and Modeling with ArcGIS® for Desktop 10
- Automatic Download of Google Satellite Images and Maps for ArcGIS or QGIS
- Getting Google Earth Images into ArcGIS
- Converting Online Map and Satellite Images into GIS Data
- Creating Portable Maps for Windows and Mobile Devices
- Advanced Topics in ArcGIS for Desktop 10
- Learning ArcGIS Pro 1.2
- Downloading and Using Google Satellite and Road Maps for Creating Geographic Data and Information
- Harnessing the Power of ArcGIS for Desktop 10.4.1 (Basic + Advanced Level)
- Aerial Mapping and 3D Modeling with DJI Drones

IV. Contact

For more information about the training, please contact the trainer:

- Name: Mr. LA Vaha
- Phone: 015 718 466 / 077 718466
- Email: ezsurveying@gmail.com / laveha_lmla@yahoo.com

V. Program of the training

Topics for Day 1

Time	Topic
08:00 – 08:15	Course introduction
08:15 – 09:45	Introduction to modern photogrammetry <ul style="list-style-type: none">• What's photogrammetry?• Outputs from photogrammetry software• Hardware and software requirements• From 2D to 3D: Stereoscopy• Relative exterior orientation• Three main processing steps• Matches, keypoints, and overlaps• Two main flight plans: Aerial nadir and oblique• GSD and flight attitude• Flight plans: what could go wrong• Additional flight plans





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10:00 – 10:15	Break
10:15 – 11:00	Understanding ground control points (GCPs) <ul style="list-style-type: none"> • Georeference • Consumer grade GPS • GCPs fix georeference • Accuracy: error accumulation • GCP/Checkpoints • Quality report • How many GCPs? • Common errors • Tolerance • Mark and process
11:00 – 11:30	Understanding DJI drones and other popular drones
11:30 – 12:00	Applications of aerial mapping and 3D modeling
12:00 – 14:00	Lunch break
14:00 – 15:00	DJI GO app for shooting normal photos and videos <ul style="list-style-type: none"> • Important settings • Compass calibration • IMU calibration • Intelligent flight modes
15:00 – 17:00	Flying DJI Phantom drones with DJI GO app

Topics for Day 2

Time	Topic
08:00 – 9:00	Map Pilot for DJI app for aerial nadir flight plans <ul style="list-style-type: none"> • Important settings • Creating new aerial nadir mission with on-screen maps • Creating new aerial nadir mission with KML files • Managing missions
09:00 – 10:00	FPV Camera for DJI app for oblique flight plans <ul style="list-style-type: none"> • Important settings • Creating new oblique projects <ul style="list-style-type: none"> ○ Setting target with on-screen maps ○ Setting target with known latitude/longitude • Managing projects
10:00 – 10:15	Break
10:15 – 12:00	Flying DJI Phantom drones with Map Pilot for DJI and FPV Camera for DJI apps
12:00 – 14:00	Lunch break
14:00 – 17:00	Processing captured images with Pix4Dmapper Pro software (1)





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Topics for Day 3

Time	Topic
08:00 – 10:00	Processing captured images with Pix4Dmapper Pro software (2)
10:00 – 10:15	Break
10:15 – 12:00	Processing captured images with Pix4Dmapper Pro software (3)
12:00 – 14:00	Lunch break
14:00 – 17:00	<ul style="list-style-type: none">• Generating DTM from Point Cloud with LASTOOLS• Creating contour lines from DTM in ArcMap• Working with drone mapping outputs in ArcMap

Topics for Day 4 and 5

- Creating new aerial mapping and 3D modeling projects (to be done by all participants).
- Processing captured images with Pix4Dmapper Pro software (to be done by all participants)
- Generating DTM from Point Cloud with LASTOOLS (to be done by all participants)
- Creating contour lines from DTM in ArcMap (to be done by all participants)
- Working with drone mapping outputs in ArcMap (to be done by all participants)

