

FIG WORKING WEEK 2019

22-26 April, Hanoi, Vietnam

Presented by the FIG Working Week 2019,
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"Geospatial Information for a Smarter Life
and Environmental Resilience"



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APPLICATIONS OF COLLECTION AND PROCESSING UAV DATA: THE PROBLEMS AND TREND TO RESOLVE



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1. INTRODUCTION

In recent years we have not unfamiliar with the term unmanned aerial vehicle (UAV). Technology Aerial photogrammetry taken by UAV is used in many different industries and has made certain achievements. UAV technology has been developing very intense, but also exist many problems remaining unsolved, as a challenge for researchers in the future. There are problems about the orthophotos establish, the DTM/DSM, the 3D model and accuracy of the results.



PROBLEMS -> RESOLVE

2. UAVs AND APPLICATIONS

2.1. UAV HELICOPTER TYPE

- Multipurpose UAV
- Multisensory;
- Complex orbit
- Small Landing zone

- Short flight time;
- Stabilization;
- Low wind speed resistance;
- Require good skill pilot;

ADVANTAGES

DISADVANTAGE



Microdrone MD4-1000



Inspire Pro DJI

2. UAVs AND APPLICATIONS

2.2. UAV fixed wing

- Long flight time
 - Stable operation
 - High cruise speed
 - High Wind speed Resistance
 - Hand launch; Launcher
 - Automatic landing
-
- Require large Landing zone (150x300 m)
 - Limited camera.

ADVANTAGES

DISADVANTAGE



Ebee Sense Fly

01

2. UAVs AND APPLICATIONS

2.3. UAV hybrid

- Mixed advantages
- the operational flexibility of multicopters and the smooth, fast flight of fixed-wing airplanes.

ADVANTAGES

- High cost

DISADVANTAGE



CP15



FireFLY6 PRO

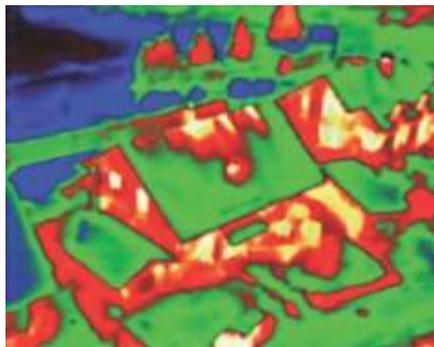


JumpShip

2. UAVs AND APPLICATIONS

2.4. Sensor

- Camera
- Thermal camera
- Agriculture camera (NirCamera)



2. UAVs AND APPLICATIONS

2.4. applications

Cadastral



Mapping, 3D map

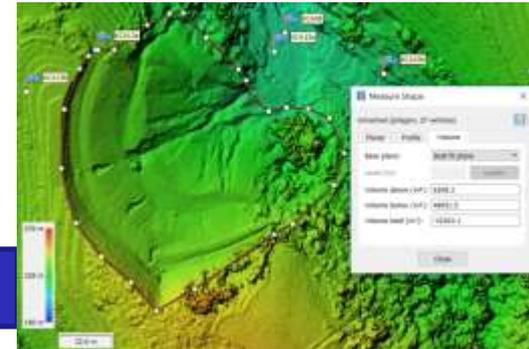
Monitoring, video transition

2. UAVs AND APPLICATIONS

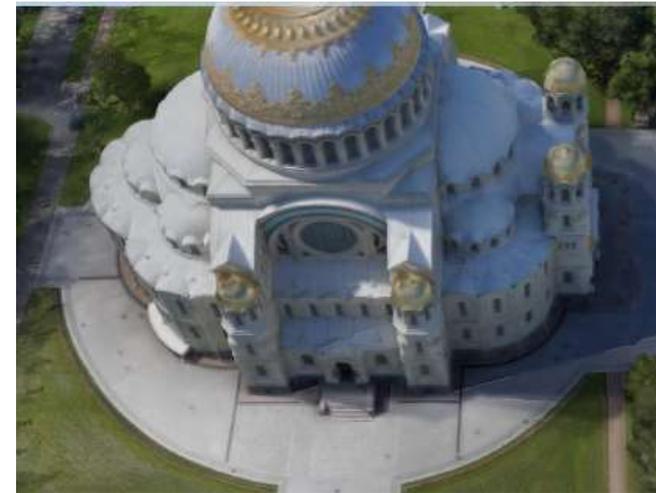
2.4. applications



Power line monitoring



Landslide monitoring



Detail 3D models



Powerline Planning

3. FLIGHT PLANNING AND DATA PROCESSING

GeoScan → GeoPlanner
Ebee → Emotion
Trimble → Aerial Imaging
DJI, .. → Pix4Capture, MapMadeEasy



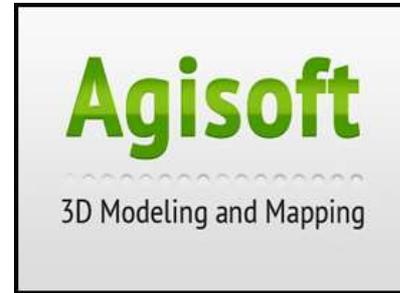
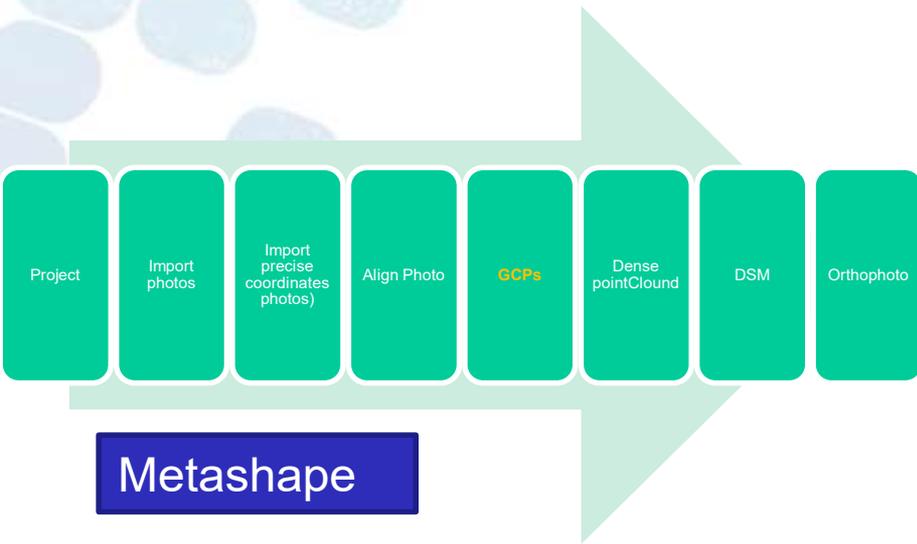
GeoPlanner

Emotion



MapMadeEasy

3. FLIGHT PLANNING AND DATA PROCESSING



Commercial software



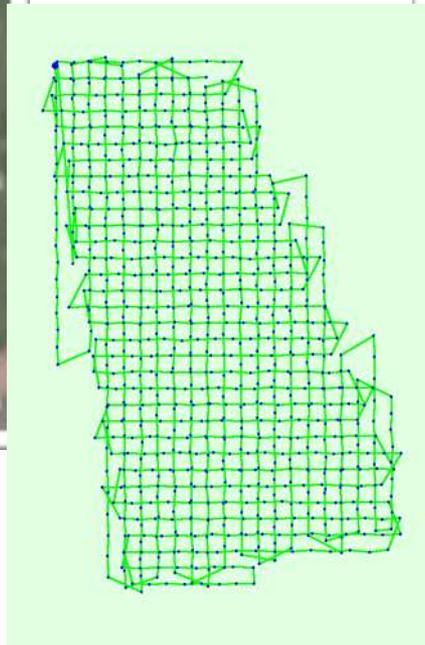
Easy to use

4. PROBLEMS AND TREND TO RESOLVE

4.1. Orthomosaic quality



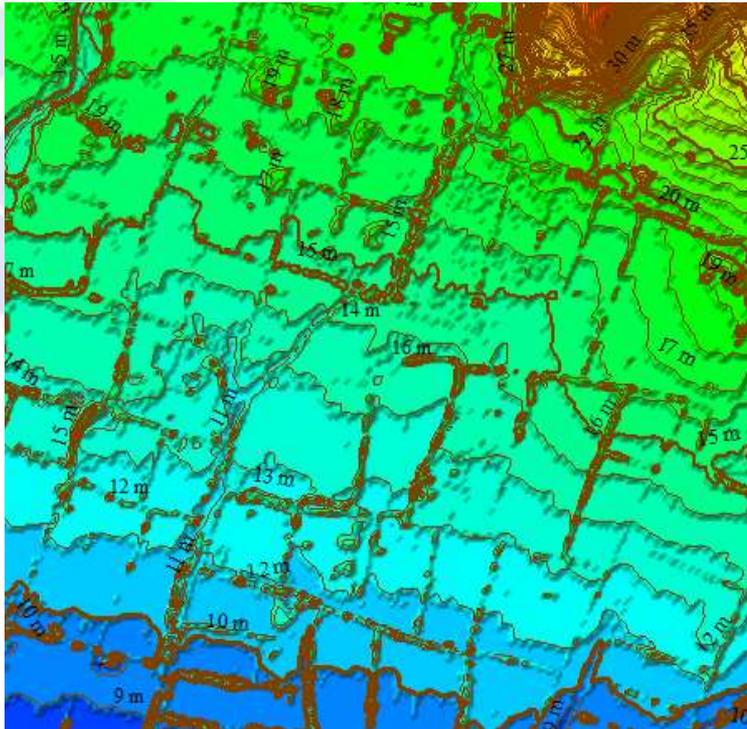
Melting edge



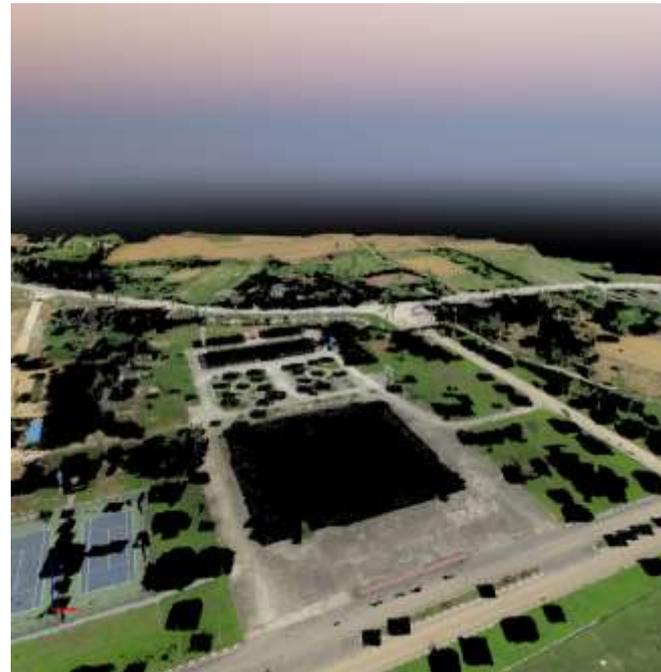
fixed

4. PROBLEMS AND TREND TO RESOLVE

4.2. DTM & DSM Quality



DSM



DTM

Point cloud classification
ImageStation -> Manual draw DTM lines



4. PROBLEMS AND TREND TO RESOLVE

4.2. DTM & DSM Quality



Lidar UAV

4. PROBLEMS AND TREND TO RESOLVE

4.3. Hardware and Software



Battery



Parachute



So many Software -> ??

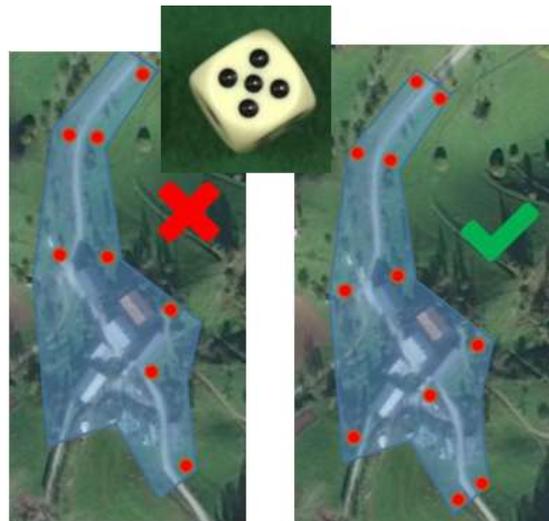
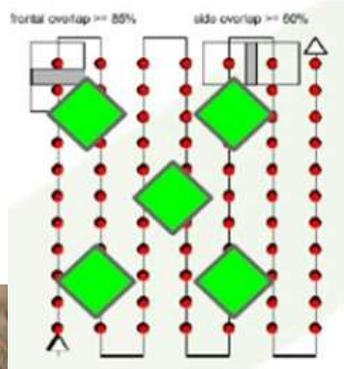
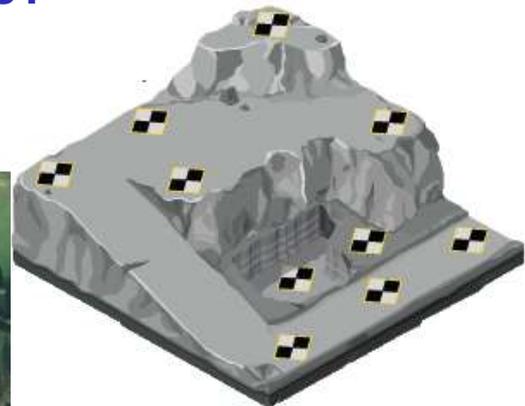
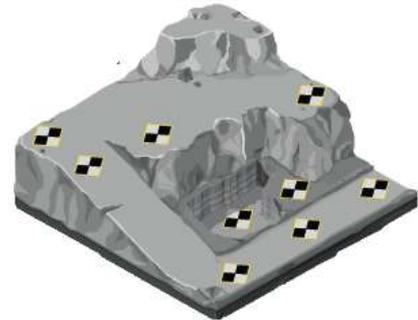
4. PROBLEMS AND TREND TO RESOLVE

4.4. Accuracy

Map scale: 1/500. 1/1000. 1/2000

How to improve accuracy H/V.

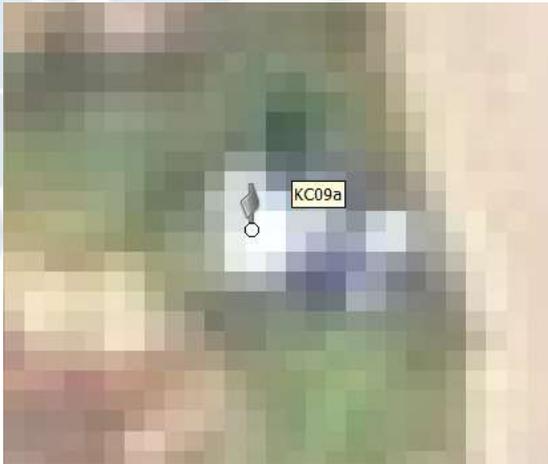
How many GCPs?
How big GCP size?
How do we spread GCPs?



RTK

4. PROBLEMS AND TREND TO RESOLVE

4.4. Accuracy



4. PROBLEMS AND TREND TO RESOLVE

4.5. Other

Flight route

Weather

Emergency situation

Data Processing

Landing zone

Flight time

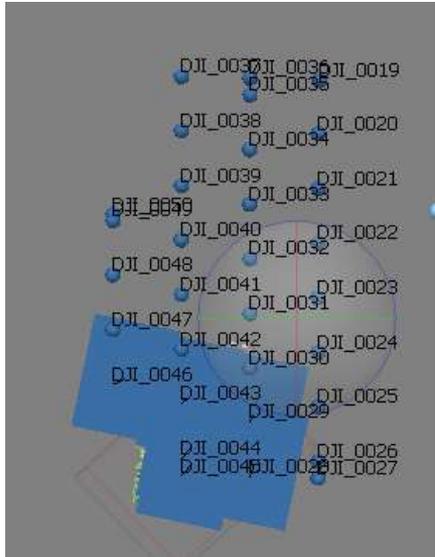
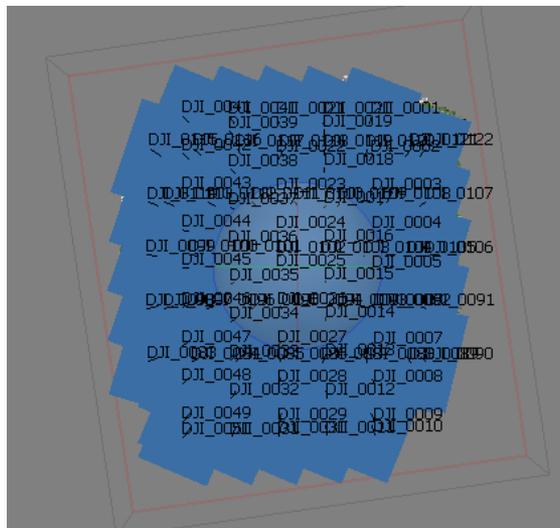




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THANK YOU!

Q&A

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