

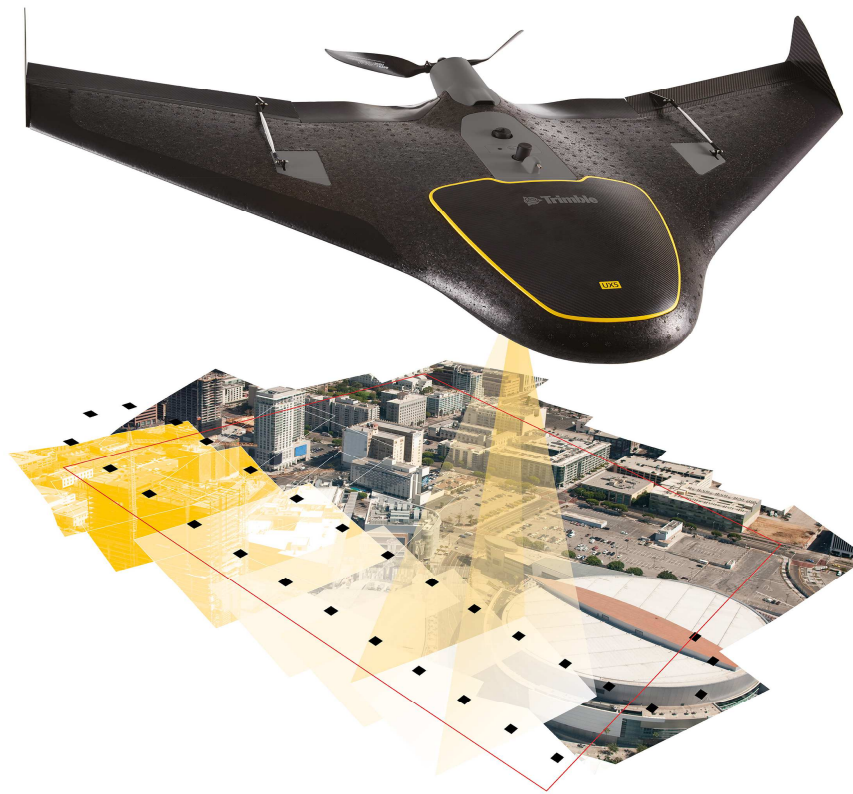


BEODAYS 2013

Trimble UX5 - demoflight

www.coudere.be

Trimble UX5 Aerial Imaging System



- Who is Coudéré
- The Trimble UX5
- The flight
- Post processing
- Examples

Who is Coudéré

Incubation

++++
+ + + + **4C GRID**
+ + + + GEO-ICT PROJECT INCUBATOR



Premium geomatics
solutions



Supporting services



Trimble UX5 - Integrated system and workflow

- Unmanned Aerial Vehicle
 - Fixed wing (endurance 50 minutes)
 - Autopilot
- Sony NEX5R digital camera
 - 16 MP
 - RGB & NIR version
- Processing software based on INPHO
 - Orthoimage
 - Digital Surface Model

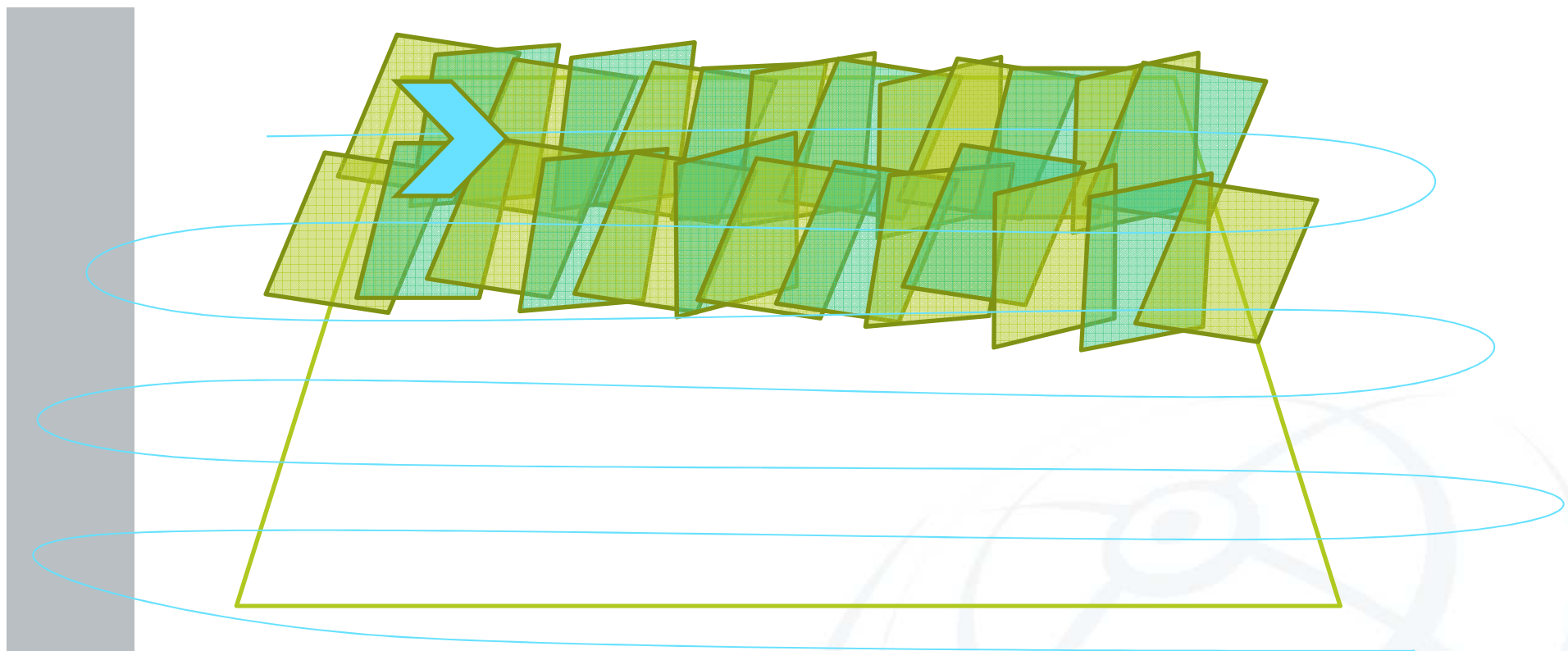


1. Data Acquisition

2. Data Processing

3. Data Analysis or postprocessing

Data acquisition



Before the flight

- Flight authorisation
- Insurance
- Site knowledge
- Weather

Lat: 50.56 Long: 4.26

Feluy

Charleroi, Hainaut, Belgium, 7181

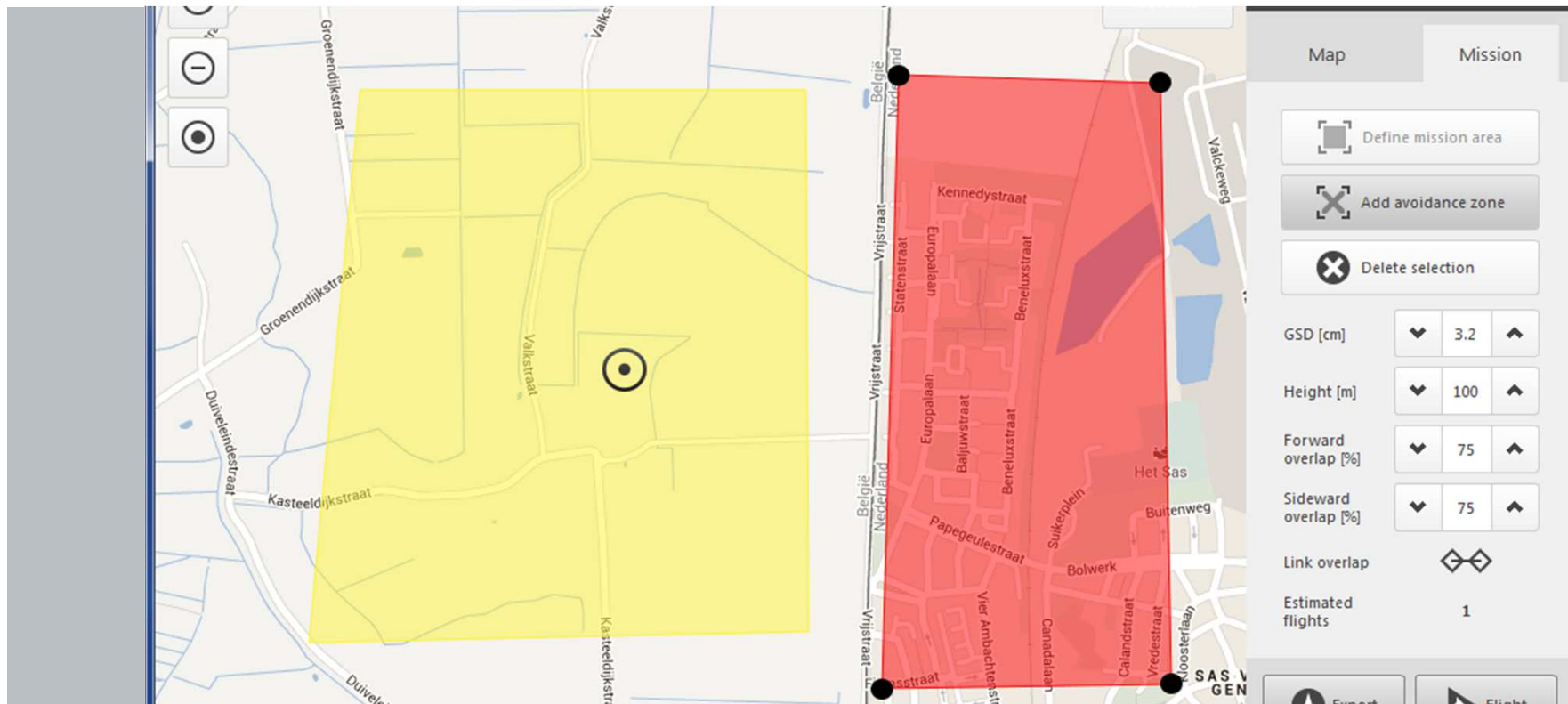
Tue 19 Nov CET

	Wind	Avg.	Gust	Temp.	Rain	Weather	Cloud	Visibility	Pressure
16:00	↙ NW	12 mph	to 22 mph	6 C	0 mm	☁	94%	13900 m	1009 mb
19:00	↙ NNW	10 mph	to 23 mph	4 C	0 mm	☁	92%	14000 m	1011 mb
22:00	↙ NNW	8 mph	to 16 mph	2 C	0 mm	☁	87%	16900 m	1012 mb

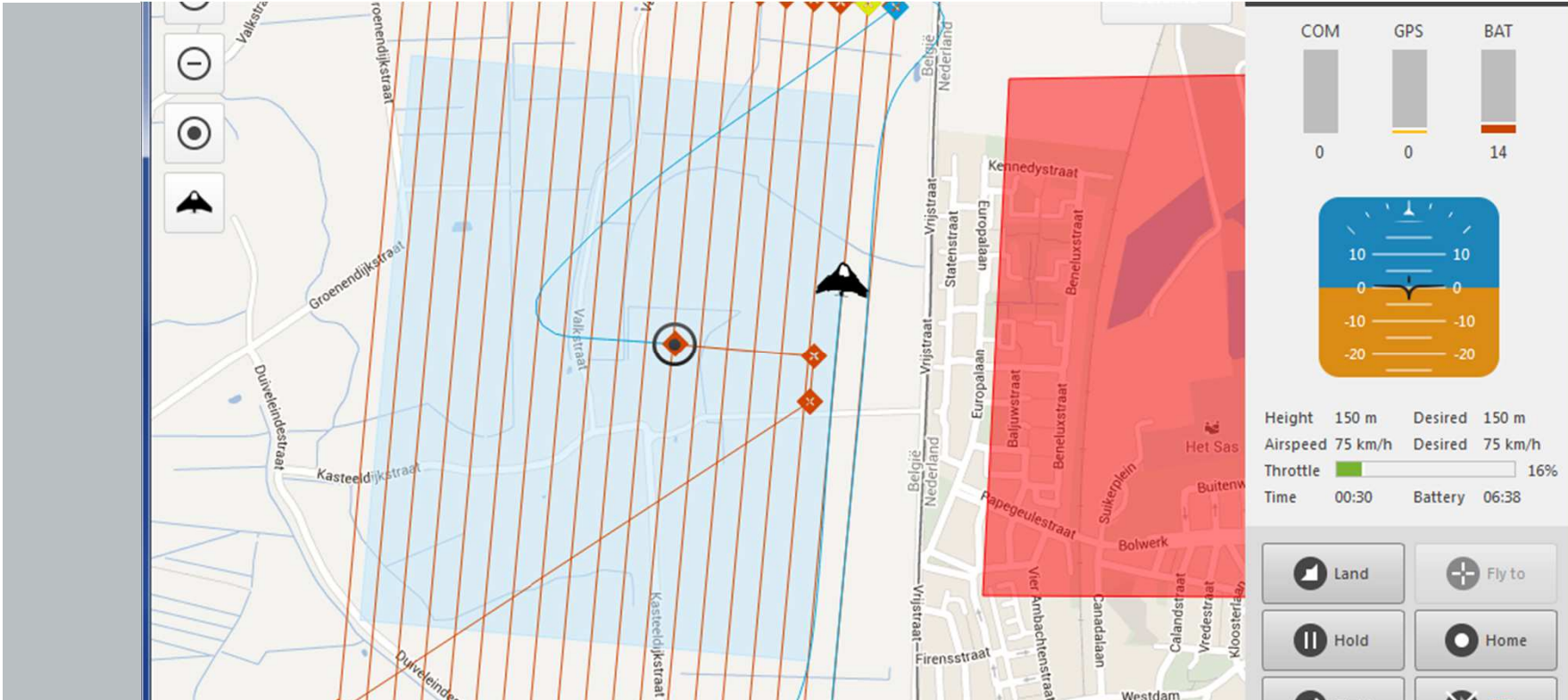
Wed 20 Nov CET

	Wind	Avg.	Gust	Temp.	Rain	Weather	Cloud	Visibility	Pressure
01:00	↙ NNW	7 mph	to 12 mph	1 C	0 mm	☁	86%	16500 m	1013 mb
04:00	↙ NW	6 mph	to 9 mph	1 C	0 mm	☁	54%	18800 m	1012 mb
07:00	➡ W	8 mph	to 14 mph	1 C	0 mm	☾	15%	19000 m	1012 mb
10:00	➡ WSW	10 mph	to 17 mph	2 C	0 mm	☁	37%	19900 m	1010 mb
13:00	↘ SW	15 mph	to 26 mph	4 C	0.8 mm	☁	93%	19000 m	1005 mb
16:00	↘ SSW	20 mph	to 39 mph	3 C	4 mm	☁	96%	13900 m	1000 mb
19:00	↘ SW	15 mph	to 29 mph	2 C	0.9 mm	☁	97%	8600 m	999 mb
22:00	↘ SW	9 mph	to 17 mph	1 C	0 mm	☁	76%	8600 m	997 mb

Defining the Project Area



Flight Operation



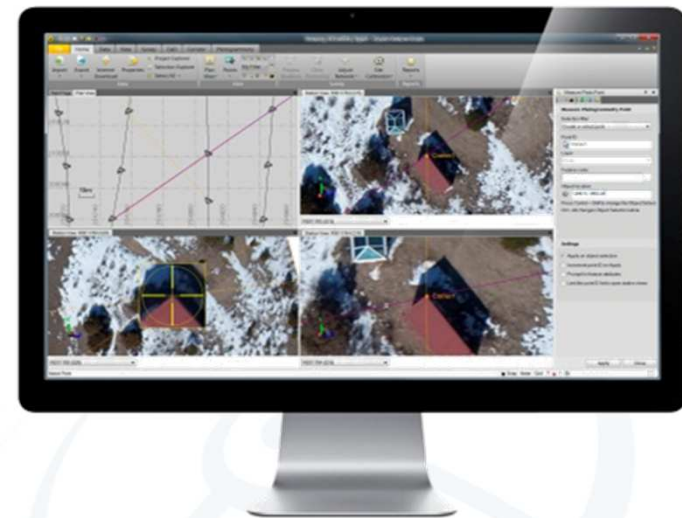
The screenshot displays a flight operation interface. On the left, a map shows a flight path (blue line) over a grid of orange lines, with a black bird icon representing the drone. The map includes street names such as Valkstraat, Groenendijkstraat, Kasteeldijkstraat, and Vrijstraat. A red shaded area on the right side of the map indicates a restricted or no-fly zone. On the right side of the interface, there is a control panel with the following elements:

- COM, GPS, BAT:** Three vertical bar indicators showing signal strength for COM (0), GPS (0), and BAT (14).
- Altitude Gauge:** A gauge with a blue top half and orange bottom half, showing current altitude (0) and desired altitude (10).
- Height:** Current 150 m, Desired 150 m.
- Airspeed:** Current 75 km/h, Desired 75 km/h.
- Throttle:** A green progress bar showing 16% throttle.
- Time:** 00:30.
- Battery:** 06:38.
- Control Buttons:** Land, Fly to, Hold, Home, and other navigation controls.

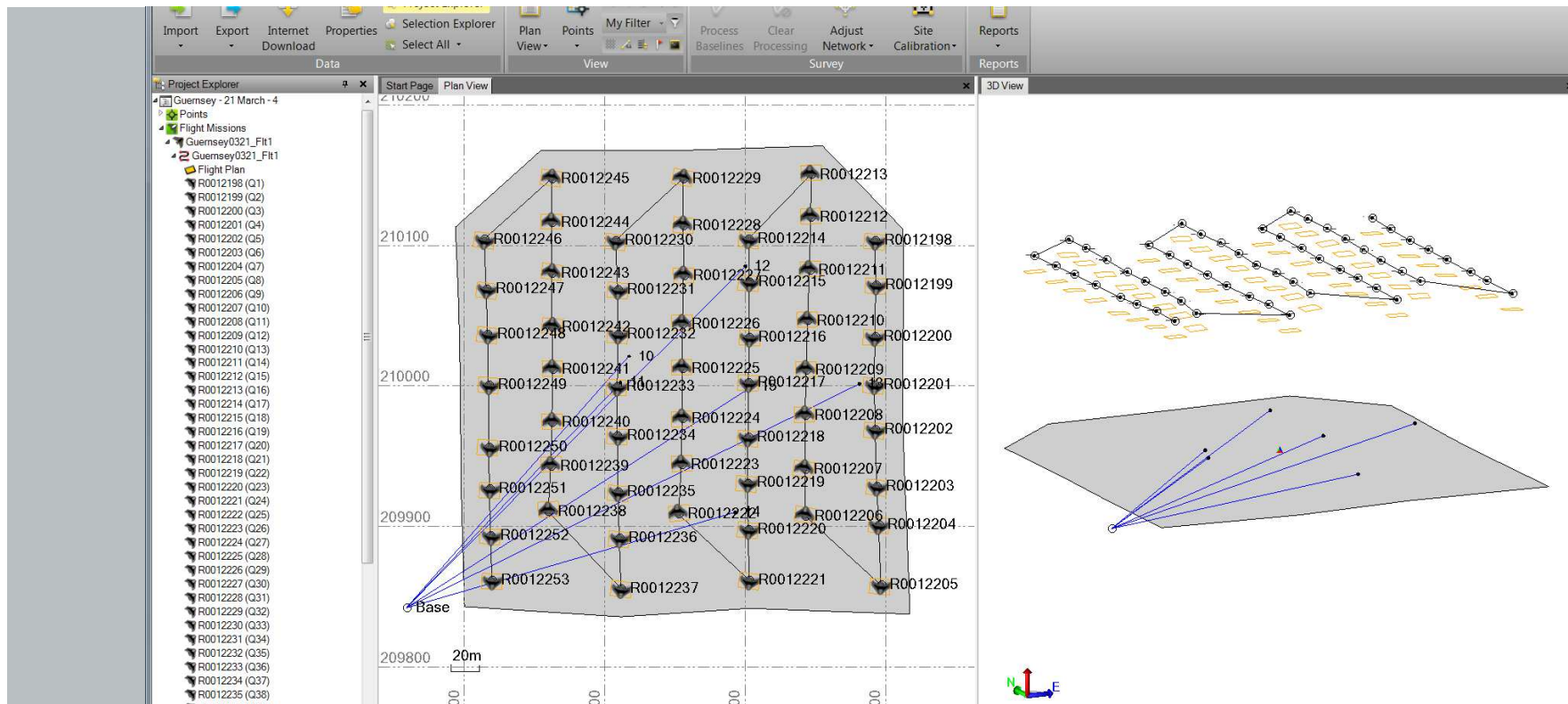


Trimble Business Center Photogrammetry Module

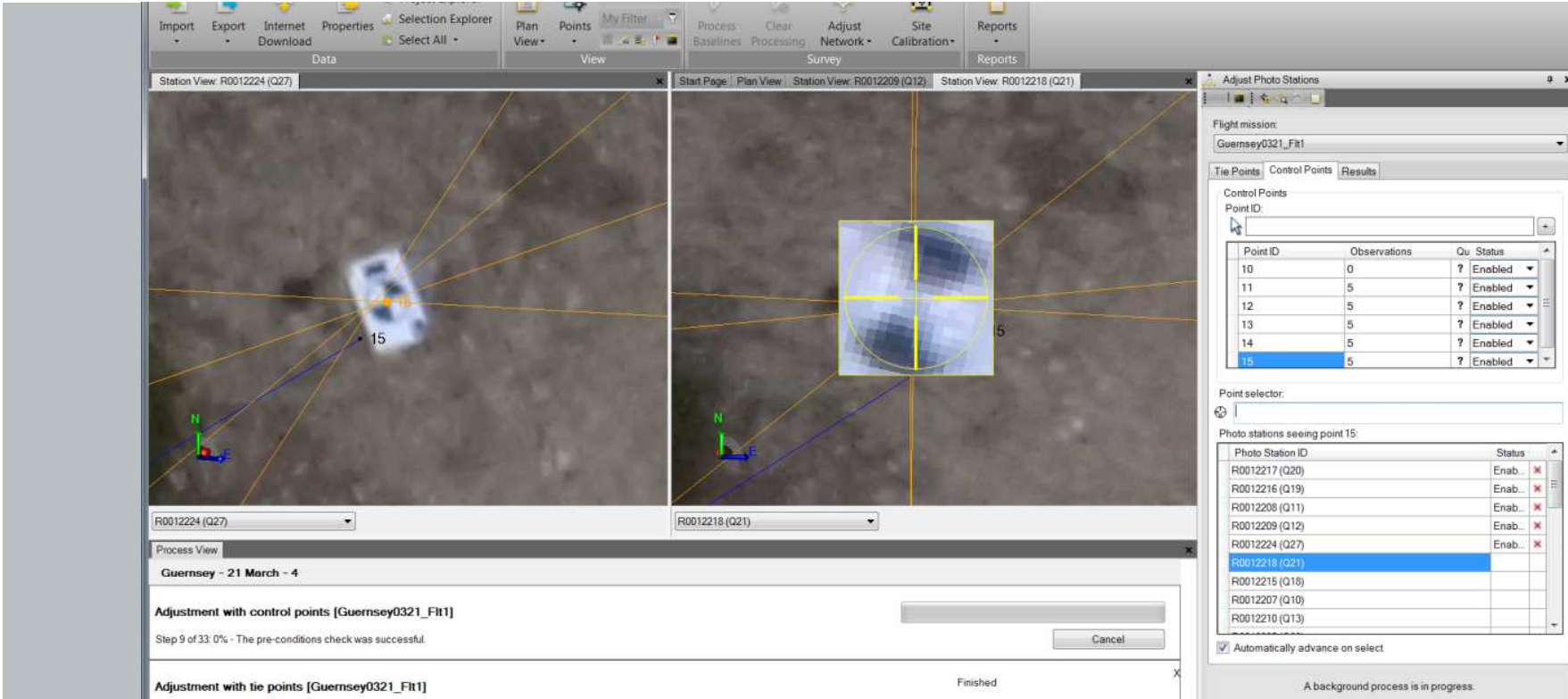
- Photogrammetry processing using technology from Inpho
- Simple workflows
 - importing flight data,
 - stitching images,
 - identifying ground control points,
 - producing deliverables



Import Flight Data



Identify Ground Control Points



The screenshot displays the 'Adjust Photo Stations' window in the Coudéré software. The main view shows two aerial photographs with yellow lines representing camera rays and a central yellow circle indicating a ground control point. The left photo is labeled 'R0012224 (Q27)' and the right photo is 'R0012218 (Q21)'. The ground control point is labeled '15'.

The 'Adjust Photo Stations' window includes the following sections:

- Flight mission:** Guernsey0321_Flt1
- Control Points:** A table listing identified ground control points.
- Photo stations seeing point 15:** A table listing the photo stations that captured the selected ground control point.

Control Points Table:

Point ID	Observations	Qu	Status
10	0	?	Enabled
11	5	?	Enabled
12	5	?	Enabled
13	5	?	Enabled
14	5	?	Enabled
15	5	?	Enabled

Photo stations seeing point 15:

Photo Station ID	Status
R0012217 (Q20)	Enab. ✕
R0012216 (Q19)	Enab. ✕
R0012208 (Q11)	Enab. ✕
R0012209 (Q12)	Enab. ✕
R0012224 (Q27)	Enab. ✕
R0012218 (Q21)	Enab. ✕
R0012215 (Q18)	
R0012207 (Q10)	
R0012210 (Q13)	

The 'Adjustment with control points [Guernsey0321_Flt1]' window shows 'Step 9 of 33: 0% - The pre-conditions check was successful.' The 'Adjustment with tie points [Guernsey0321_Flt1]' window is marked as 'Finished'.



Orthoimage



139 Images
100 m Flight Height
3.3 GSD
300 x 600 m



139 Images
100 m Flight Height
3.3 GSD
300 x 600 m

Examples – applications in research

- ULG: Prof Lejeune
 - Forestry in Belgium and Africa
- INBO
 - Various projects in Flanders
- BYU (Utah)
 - Archaeological studies in Petra, Jordan



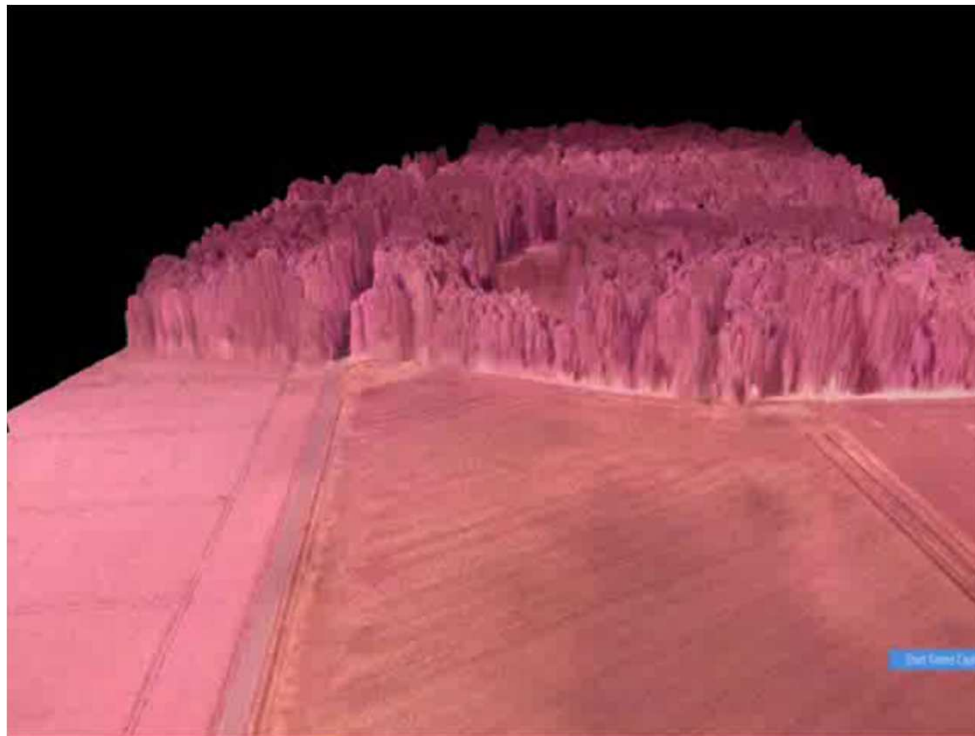
Your gateway to aerial information ...
via Coudéré !

For more information
info@coudere.be

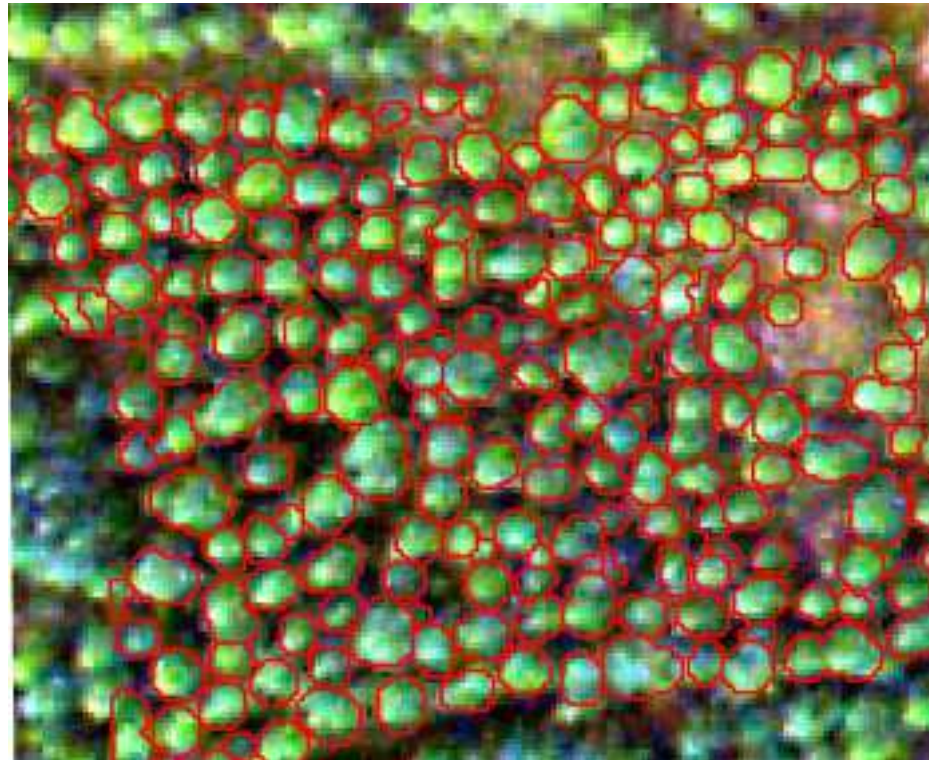
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Application: Vegetation analysis



Application: Vegetation analysis



Application: Archeology study



Topographic Survey Example



Switzerland
510 Images
400 m Flight Height
11 cm GSD
3.12 km²

Trimble UX5 Specifications

- Weight: 2.5 kg
- Wingspan: 100 cm
- Launch Type: Catapult
- Cruise Speed: 80 km/h
- Endurance (flight time): 50 min
- Flight Height (AGL): 75-750 m



Trimble UX5 Specifications

- Coverage (@ 5 cm GSD): 2.19 km²
- Coverage (@ 10 cm GSD): 4.94 km²
- GSD: 2.4-24 cm
- Planimetric precision of 1 pixel
- Altimetric precision of 2 to 3 pixels



Trimble UX5 Specifications

- Flight Ceiling: 5000 m
- Wind Speed: 65 km/h
- Landing Type: Belly



Trimble UX5 Aerial Imaging Rover

- Airframe
 - Internal carbon frame
 - Composite fiber parts
 - Expanded polypropylene foam body



Trimble UX5 Aerial Imaging Rover

- Payload Bay
 - Battery
 - Camera
 - Tracking beacon



UX5 eBox

- eBox
 - GPS & orientation sensors
 - 2.4 GHz radio
 - Autopilot



UX5 Camera

- Sony NEX5R digital camera
- 16.1 MP with APS-C sensor
- Standard color & Near Infra-Red versions

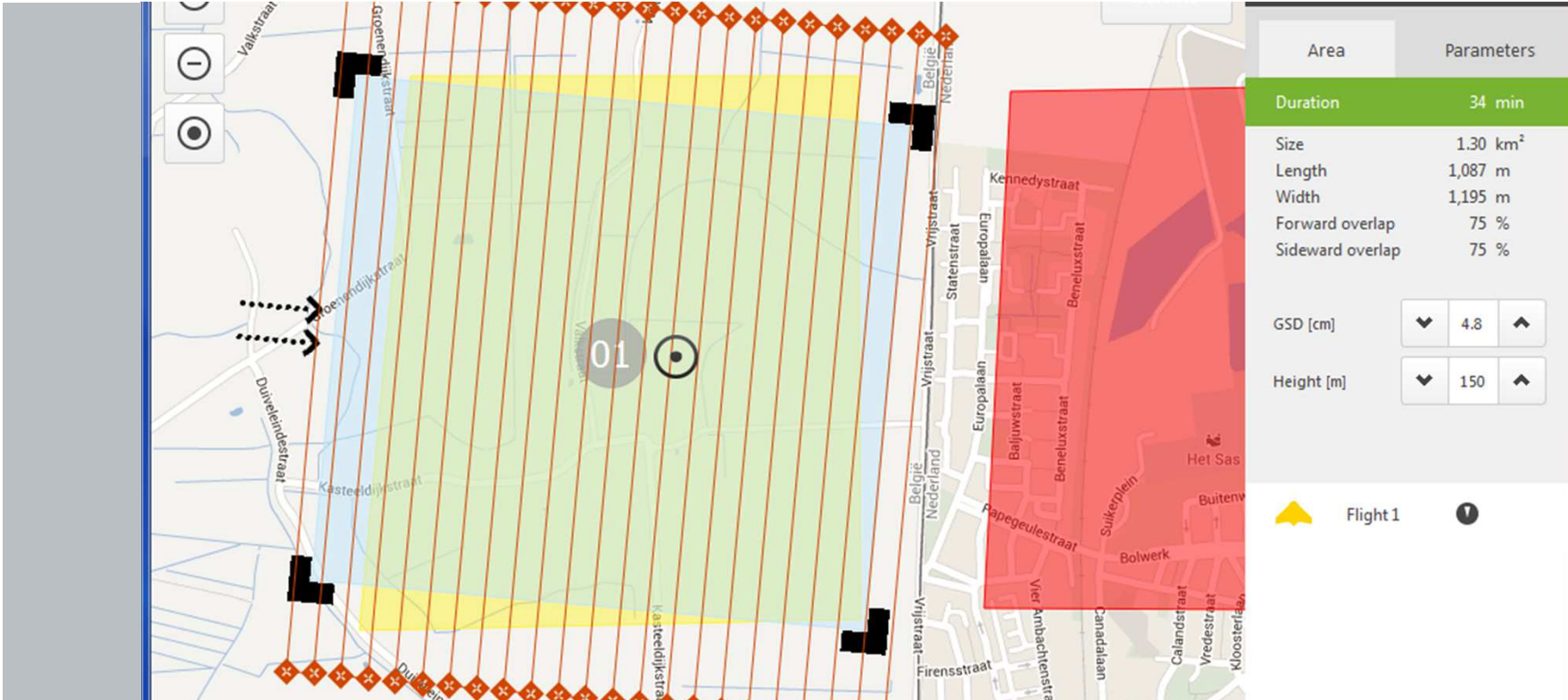


Ground Control

- Rugged Tablet
- Flight Planning & Control Software
- Communications Link
- Download Connector



Defining the Flight



The screenshot displays a map with a flight plan overlaid. The flight path is a grid of orange lines forming a rectangular area. A central point is marked with a grey circle containing the number '01'. The map shows various streets and buildings, with a red shaded area indicating a specific region. On the right side, there is a 'Parameters' panel with the following data:

Area	Parameters
Duration	34 min
Size	1.30 km ²
Length	1,087 m
Width	1,195 m
Forward overlap	75 %
Sideward overlap	75 %
GSD [cm]	4.8
Height [m]	150

Below the parameters panel, there is a yellow arrow icon and the text 'Flight 1'.

Pre-Flight Checklist

