Update on UltraCam and UltraMap technology

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New Ownership Information:

Vexcel Holdings GmbH, Graz, acquired Microsoft's UltraCam Business Unit in March 2016

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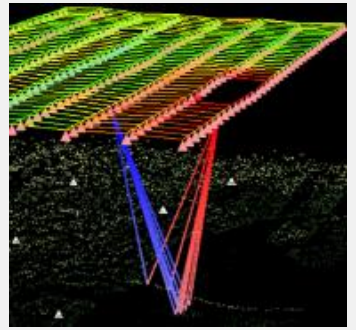
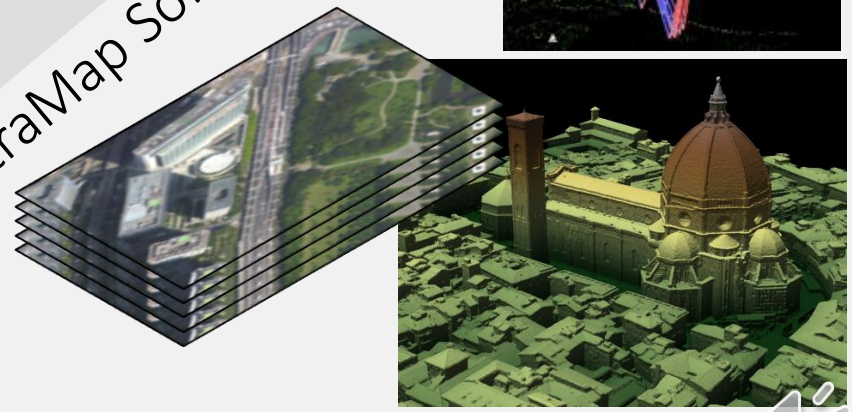
Exploring the world from every angle

Aerial Cameras

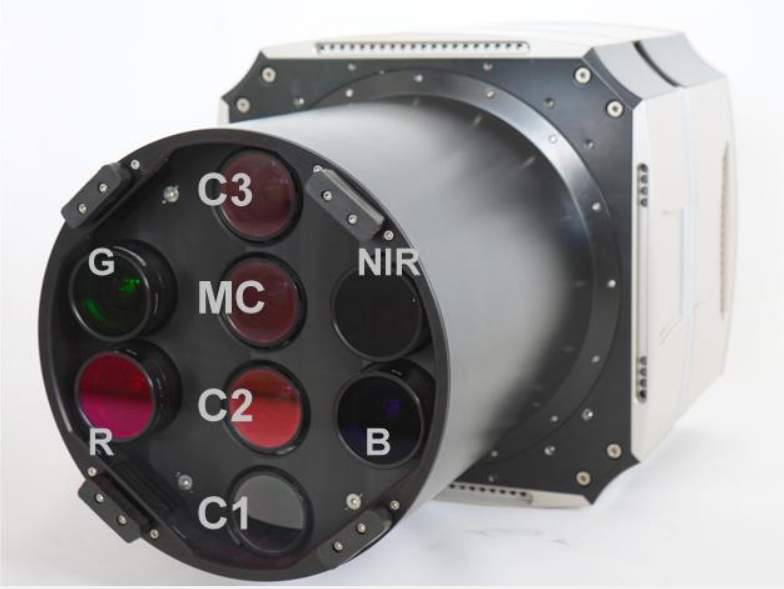
Terrestrial Systems

UltraMap Software





New: UltraCam Eagle M3

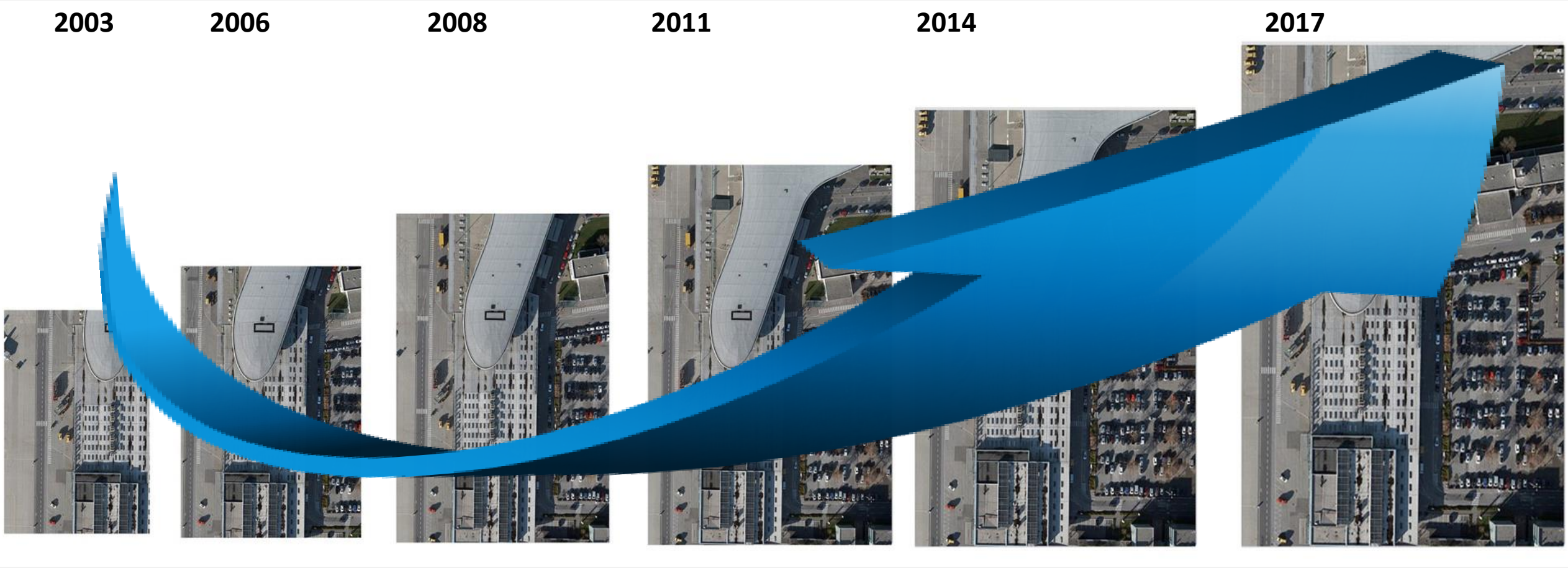


- 26,460 x 17,004 pixel
- Favorable b/h ratio
- Outstanding signal/noise ratio
- Further improved frame rate
- Four exchangeable lens systems

Highly Integrated System

UltraCam Eagle M3

PAN pixel across	26,460	PAN focal length	80, 100, 120, 210 mm
PAN pixel along	17,004	b/h (f80, f100, f120, f210)	0.34; 0.27; 0.23; 0.13
Max. frame rate	1.5s	AGL for 5cm GSD (f80, f100, f120, f210)	1,000 m; 1,250 m; 1,500 m; 2,625 m
Pan-sharpening ratio	1:3	Lens system	User exchangeable w/o recalibration
FMC	TDI (non mechanical)		



UltraCam D	UltraCam X Falcon M1	UltraCam Xp Falcon M2	Eagle M1	Eagle M2	Eagle M3
90	136	196	260	349	449 MPixel

UltraCam Eagle M3

The UltraCam Eagle M3 features also the user-exchangeable lens system

80 mm PAN

27 mm RGB & NIR

100 mm PAN

33 mm RGB & NIR

120 mm PAN

40 mm RGB & NIR

210 mm PAN

70 mm RGB & NIR

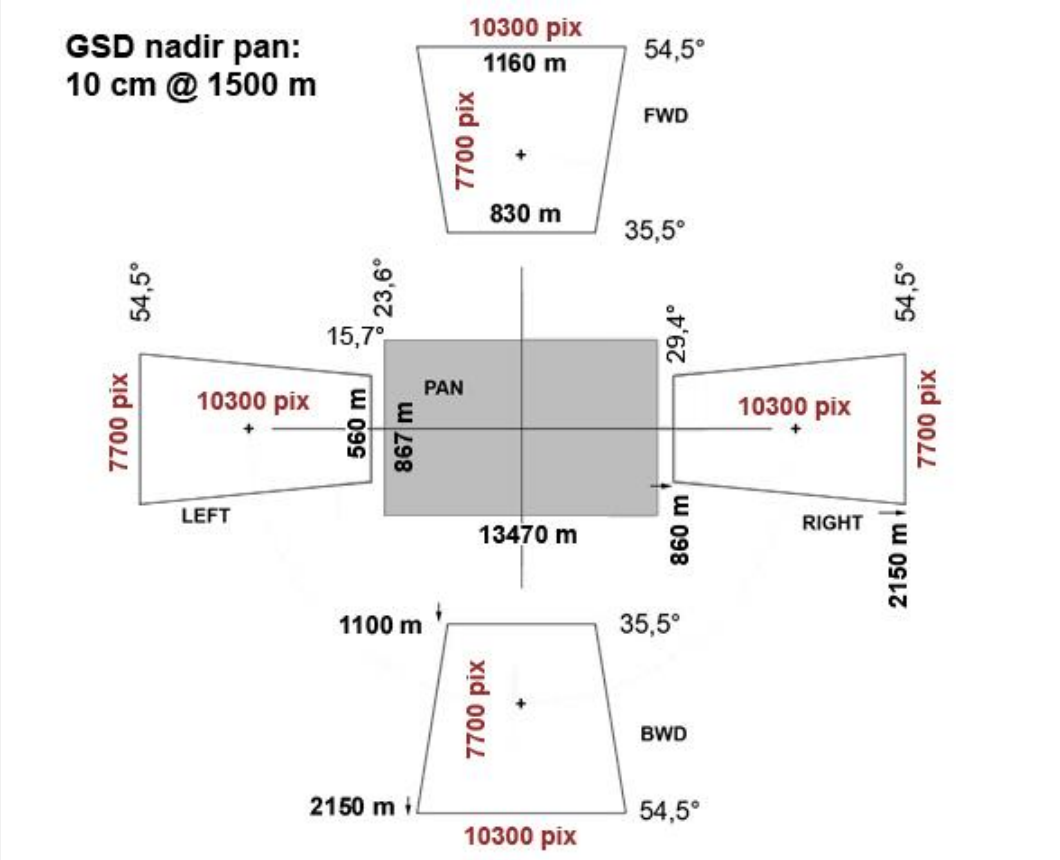
UltraCam Osprey M3p

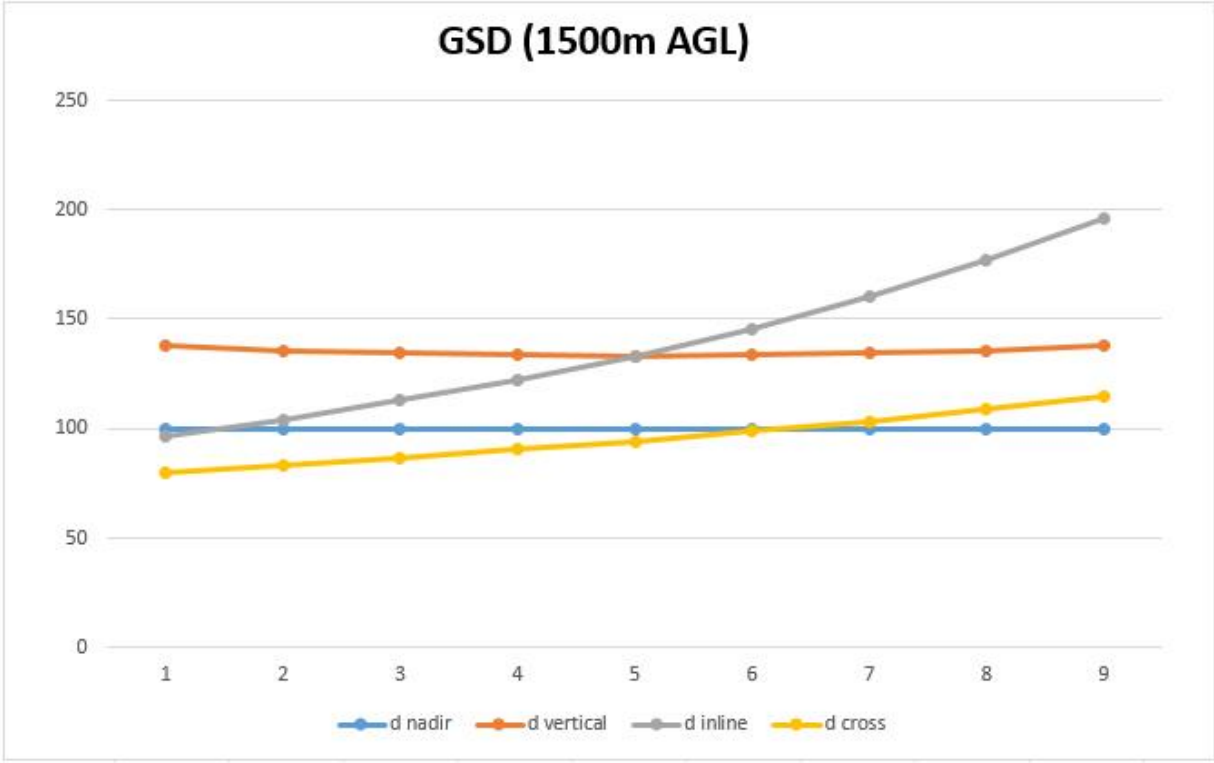
Photogrammetry meets oblique

The UltraCam Osprey Mark 3 Premium combines two cameras in one photogrammetric housing

- Mapping grade nadir (pan, 116 Mpix)
- 80 Mpix oblique (4 directions)
- Optimized design
  - 80mm nadir lens system
  - 120mm oblique lens system

UltraCam Osprey M3p





deg	35,0	37,5	40,0	42,5	45,0	47,5	50,0	52,5	55,0

Oblique View Salzburg, @ 750 m
GSD 5cm to 8 cm

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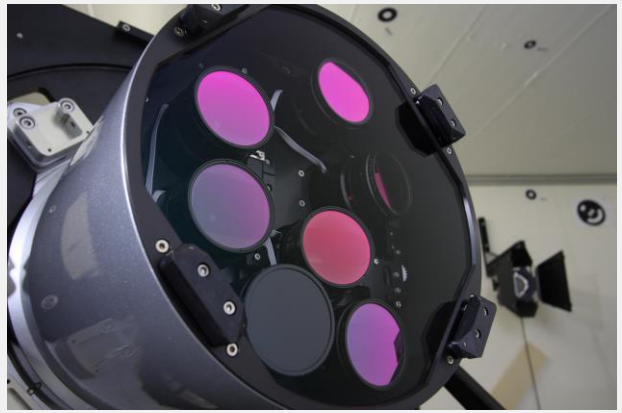
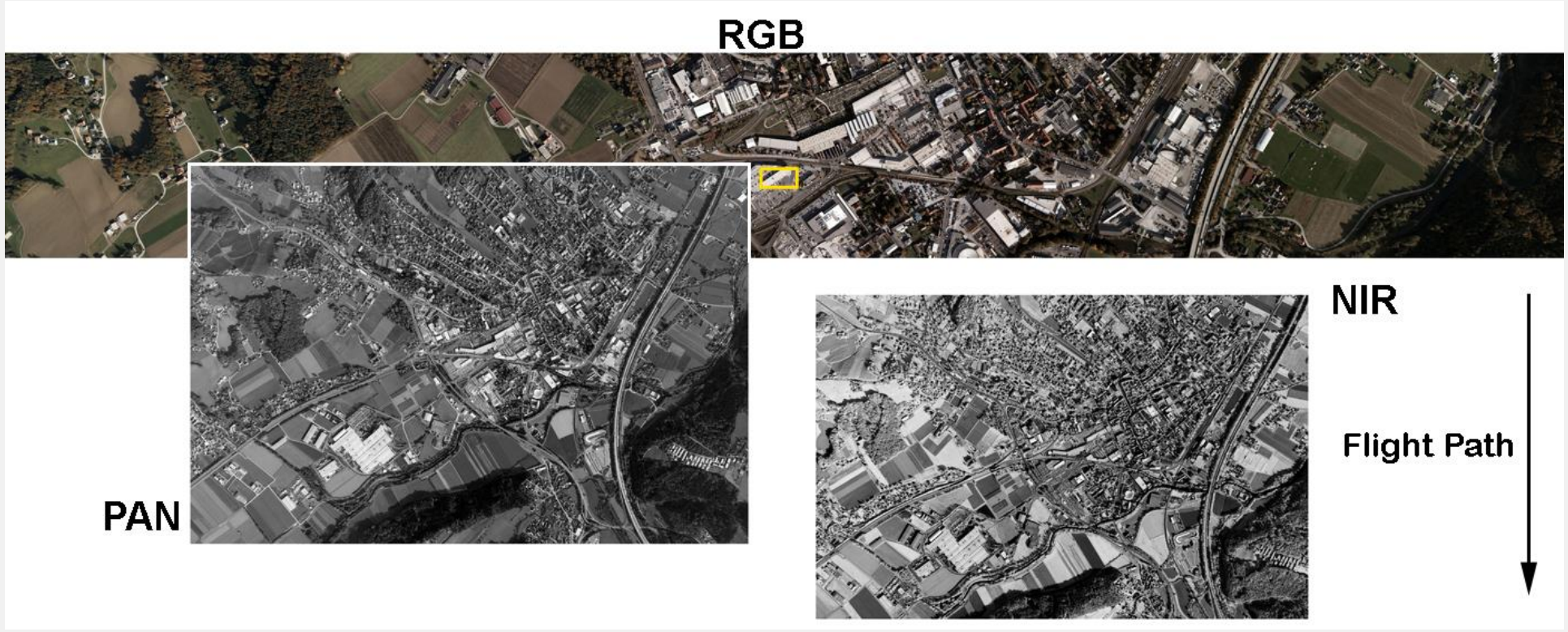
UltraCam Condor M1

38,000 pixels across the flight strip

The new UltraCam Condor for nationwide mapping



UltraCam Condor M1 Results

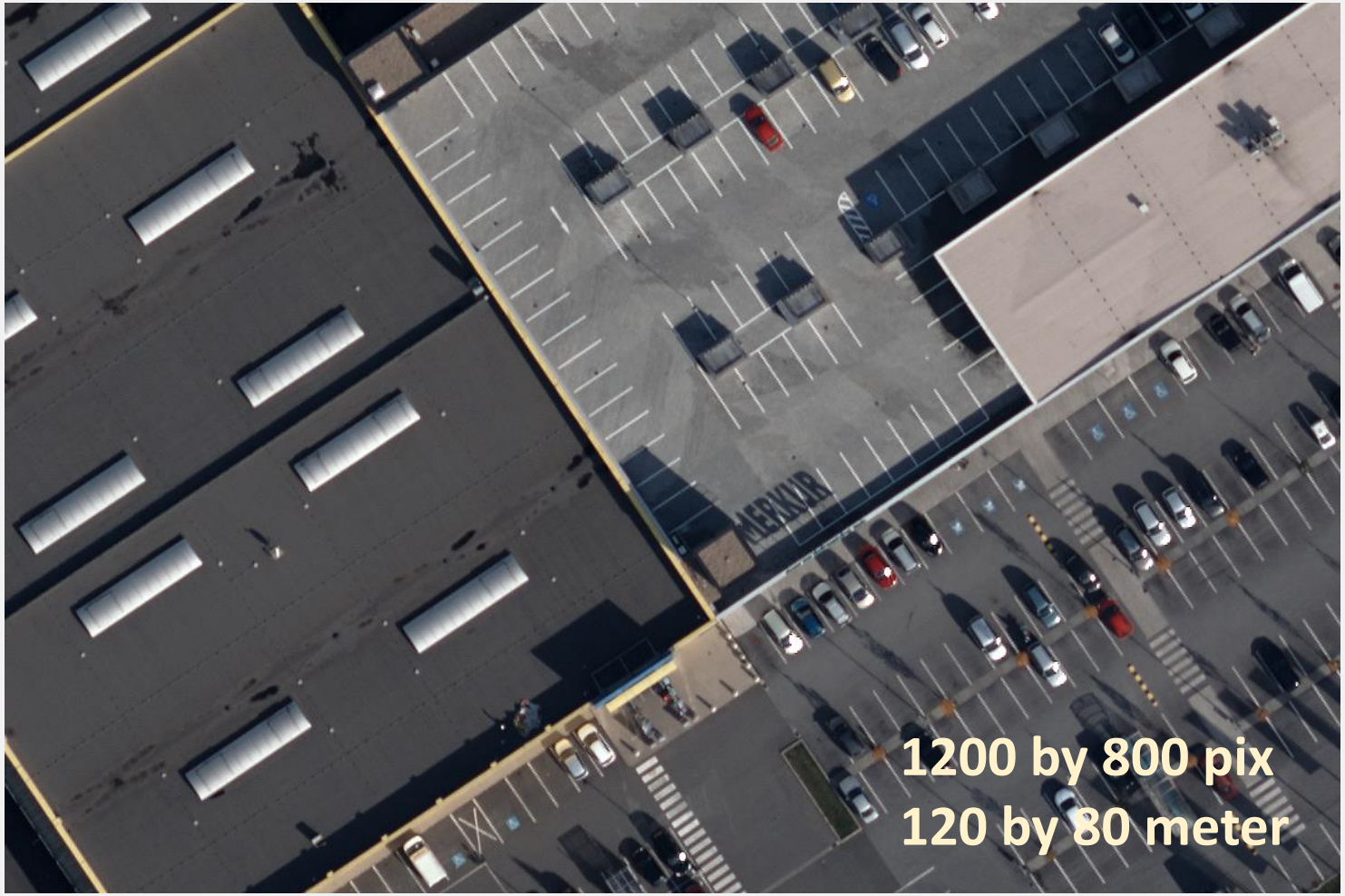


RGB: 38000 by 5000
10 cm

PAN: 13400 by 8650

NIR: 7600 by 5000
28 cm

UltraCam Condor M1 Results



UltraCam Condor M1 Design Criteria

- Designed to map large regions extremely efficient with UltraCam quality
  - Highly efficient high-resolution RGB image collection for ortho image generation
  - PAN of lower resolution supporting automated DTM and DSM generation for automated DSMOrtho and DTMOrtho image generation
  - NIR of lower resolution supporting basic classification and DSM/DTM generation
- Typicall RGB GSD: 10cm … 25cm
- Typicall flight altitude: 2,000m … 5,500m AGL
- Characteristics
  - Frame sensor for stable geometry and better independency from GPS/INS accuracy
  - Uncompressed RAW data collection @14bit for leading image dynamic and color correction without artifacts
  - FMC by TDI for fast flight speeds and high sensor reliability
  - Sophisticated 16bit UltraMap workflow corrects color shift effects of high altitude flights automated and without artifacts
- Aicrafts: turboprop and jets

UltraCam Condor M1 Specifications

	Image size	Physical pixel size
Color (RGB Bayer pattern)	38,000 x 5,000 pixels	4.6 µm
PAN	13,400 x 8,650 pixels	5.2 µm
Color (NIR)	7,600 x 5,000 pixels	4.6 µm
Color capability (multi-spectral)	4 channels – RGB Bayer pattern & NIR	
Ratio RGB to PAN to NIR	1 : 2.83 : 4.35	
Frame rate (minimum inter-image interval)	1 frame per 1.75 seconds	
Weight	64 kg	
Power consumption	Max. 350 W	
	Focal distance	Lens aperture
Color (RGB Bayer pattern)	100 mm	f=1/5.6
PAN	40 mm	F=1/4.8
Color (NIR)	23 mm	F=1/5.6
Flying height for RGB pixel size @ 10 cm GSD	2,174 m	

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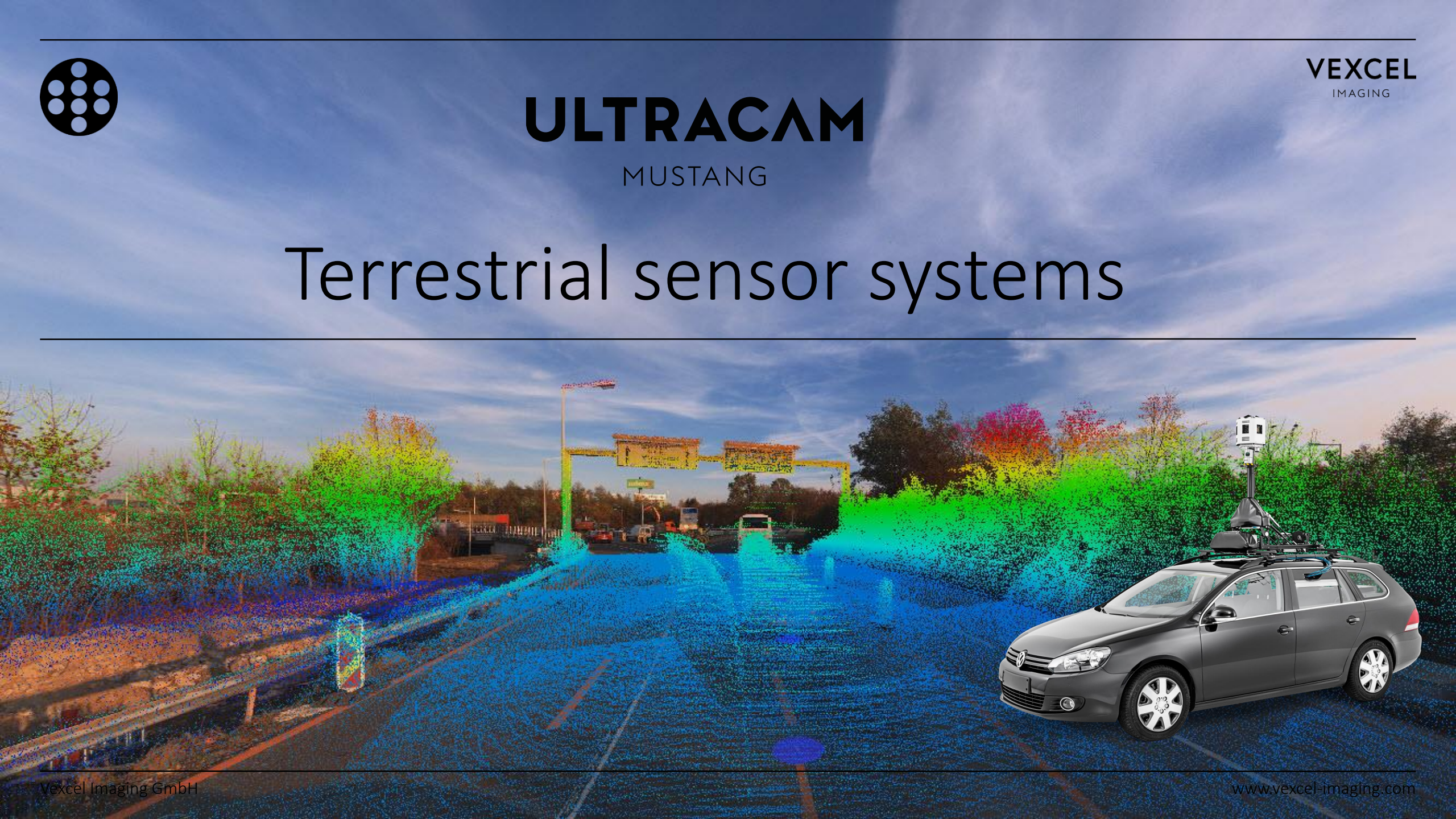
Terrestrial sensor systems



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Mobile mapping system for capturing geo-positioned panoramic imagery and 3D data of street-level scenery

Reliable partner on the road:
Collected more than 5 million kilometers so far

- Mobile mapping system for capturing geo-positioned panoramic imagery and 3D data of street-level scenery
- Designed for maximum collection efficiency and minimum downtime
- In its 3rd generation
- More than 200 systems fielded since 2007

360° Panoramic Imagery

54 Megapixels

8.0 mm high-resolution lenses

Max. 8 frames per second

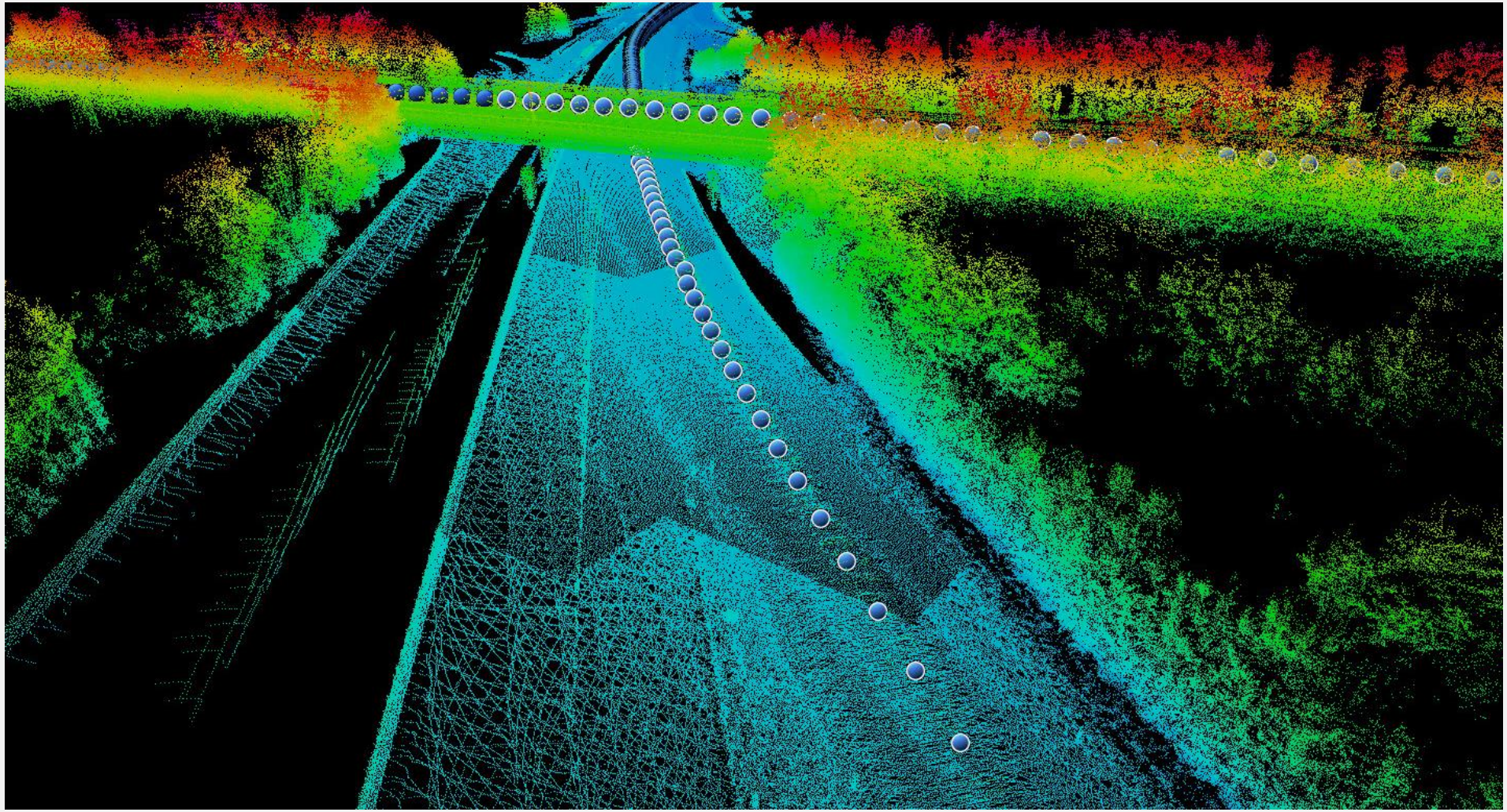

50
50

Dense LiDAR point clouds

Rotating LiDAR with 32 laser beams

700.000 points per second

Dense 3D LiDAR point cloud creation



Graz West

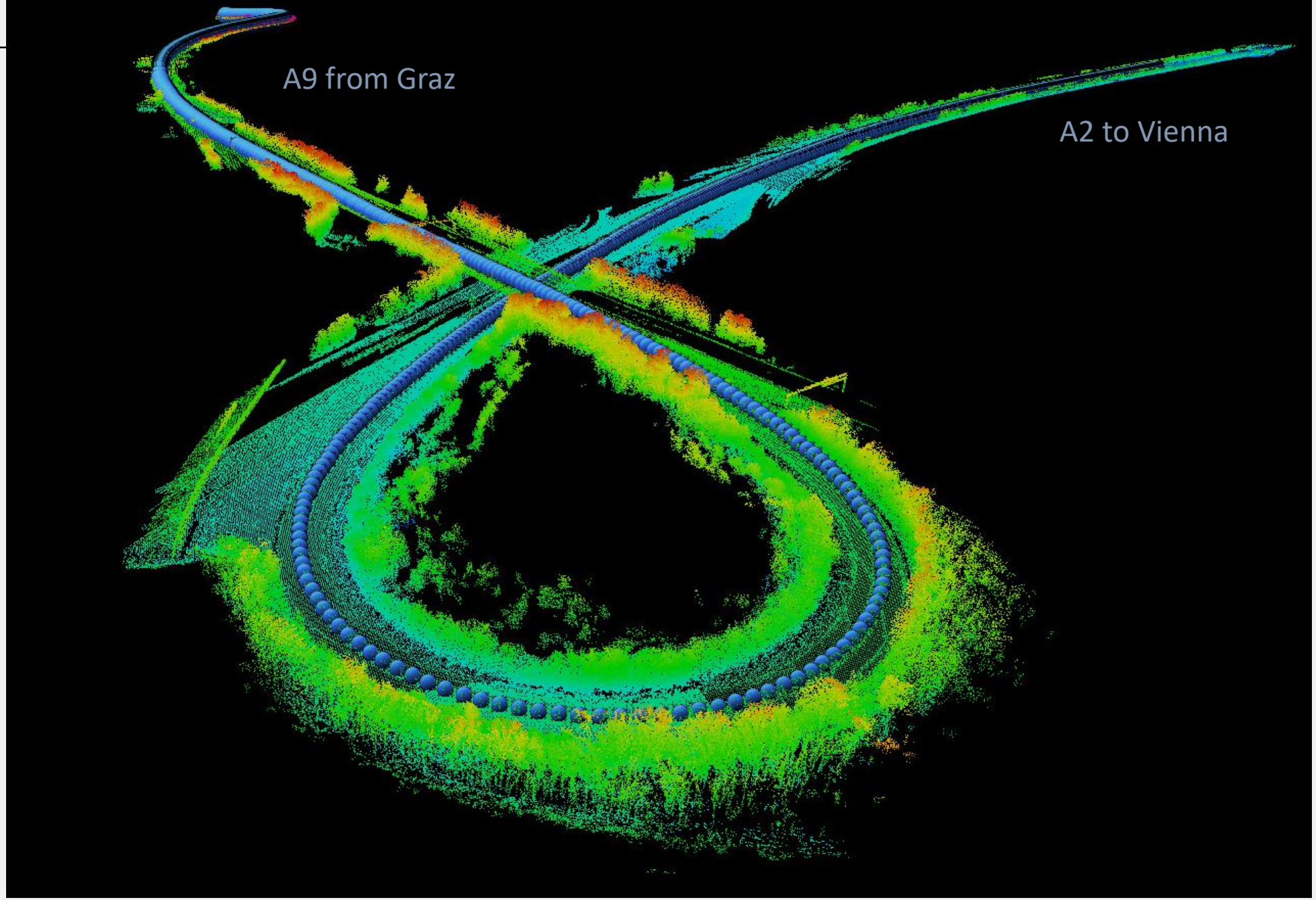
A9/A2

Dense 3D LiDAR

point cloud

Color represent

Elevation



Graz Webling

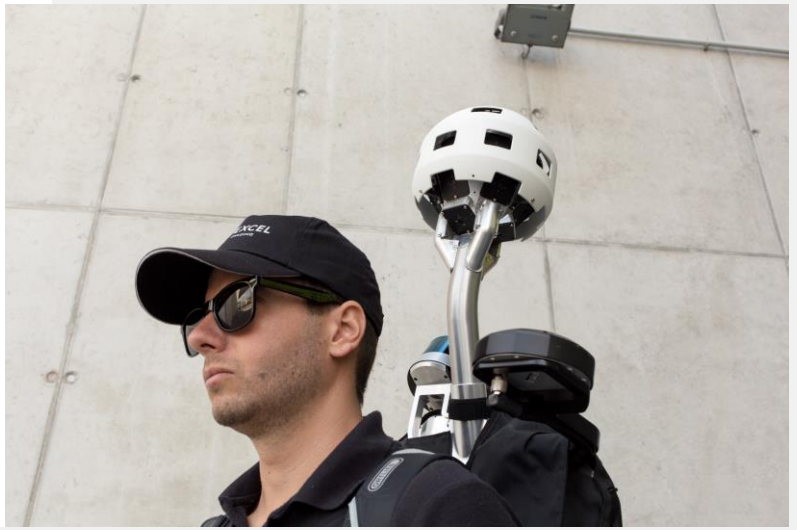
Dense 3D LiDAR point cloud

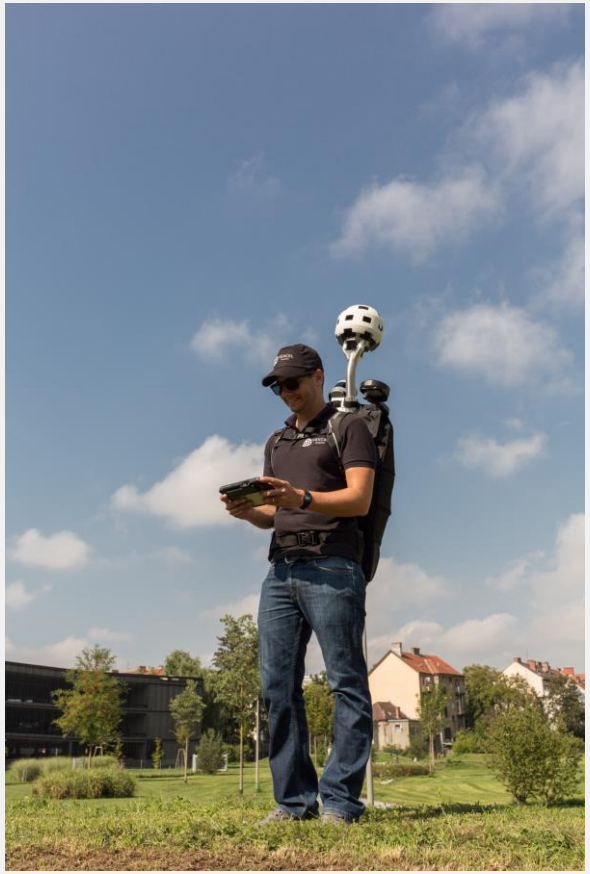
Color from UltraCam Panoramic Image Data

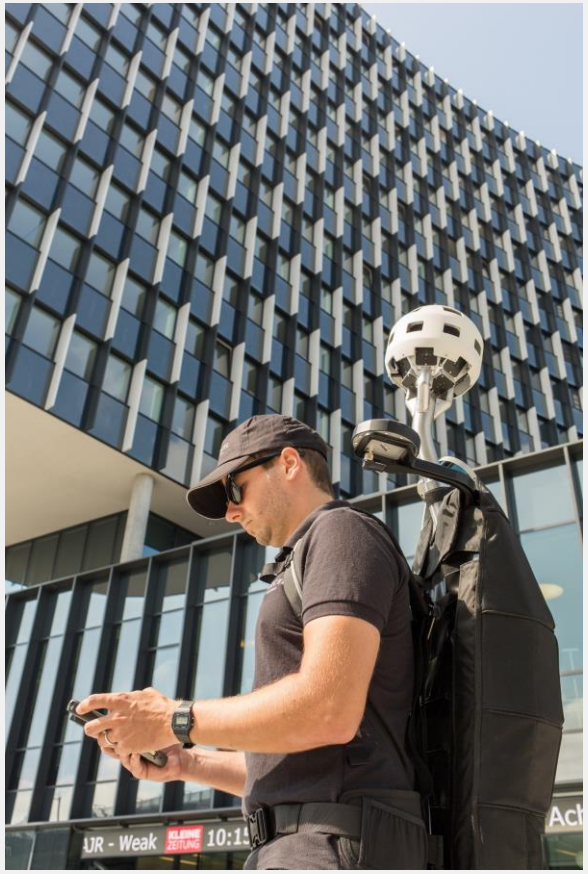
ULTRACAM

PANTHER

The UltraCam Panther enables your business to meet even the most demanding mobile mapping challenges: indoor, outdoor, everywhere!
UltraCam Panther offers outstanding flexibility for mapping and virtual reality applications






KLEINE ZEITUNG

Superior Image Quality

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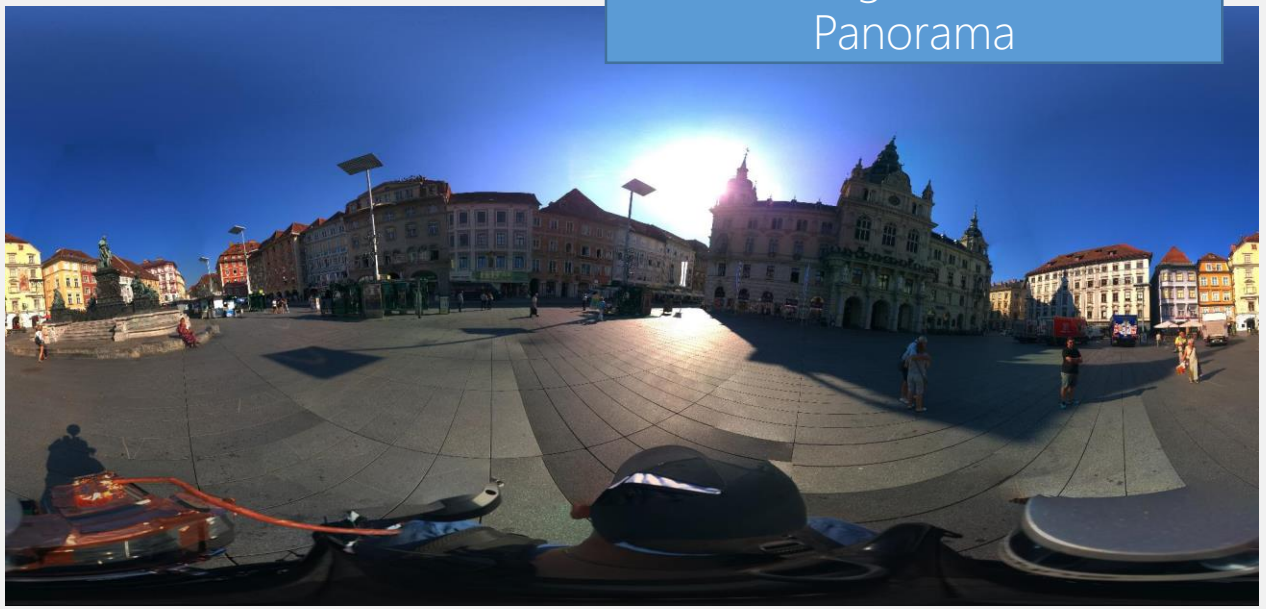
- Panoramic sensor head with 68.8 Mpixel (unique/stitched)
- 26 custom cameras
- Video frame rate max. 30 Hz
- Imagery frame rate max. 1 Hz
- 360° x 180° field of view

360-degree stitched Panorama



Exceptionally high resolution 172.1 Mpixel (gross)

Precise alignment of LiDAR & image data

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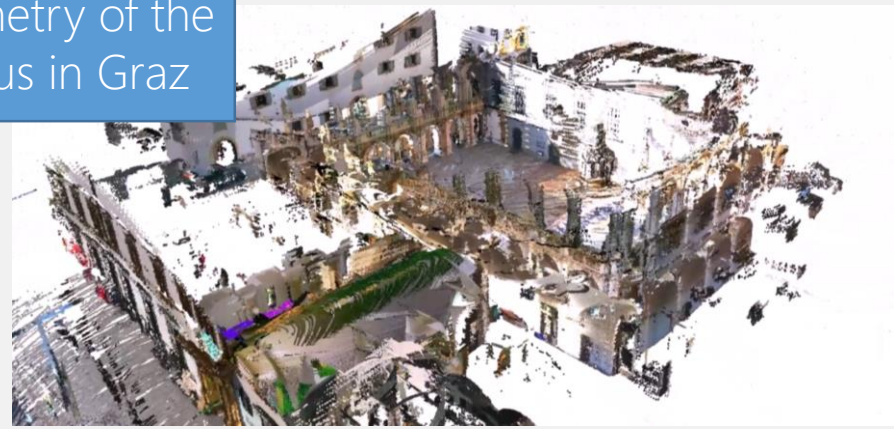
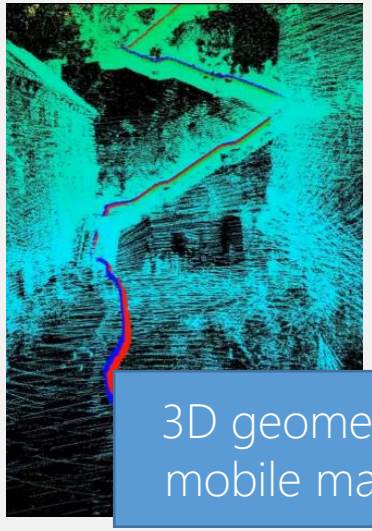
- Rotating LiDAR with 16 laser beams
- 300.000 pts/sec
- Dense 3D LiDAR point cloud creation
- Customizable LiDAR orientation to match different applications

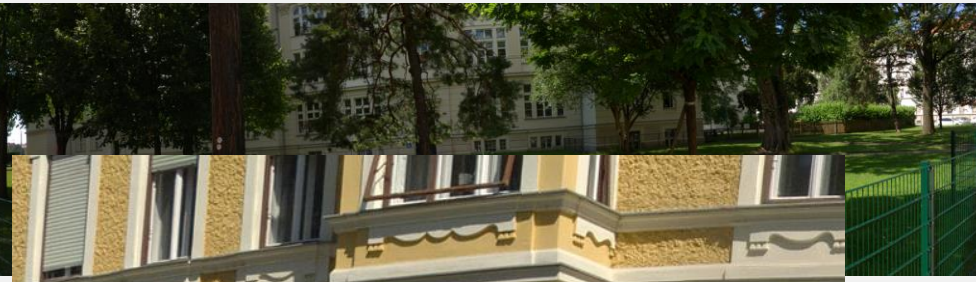
3D geometry of the Landhaus in Graz





3D geometry for mobile mapping

Spherical 3D LiDAR point cloud



- High quality panorama image
- 15.000 pixel horizontal
- Object resolution 1cm @ 20m

UltraMap V4

Digital Photogrammetric Workflow for Nadir and Oblique

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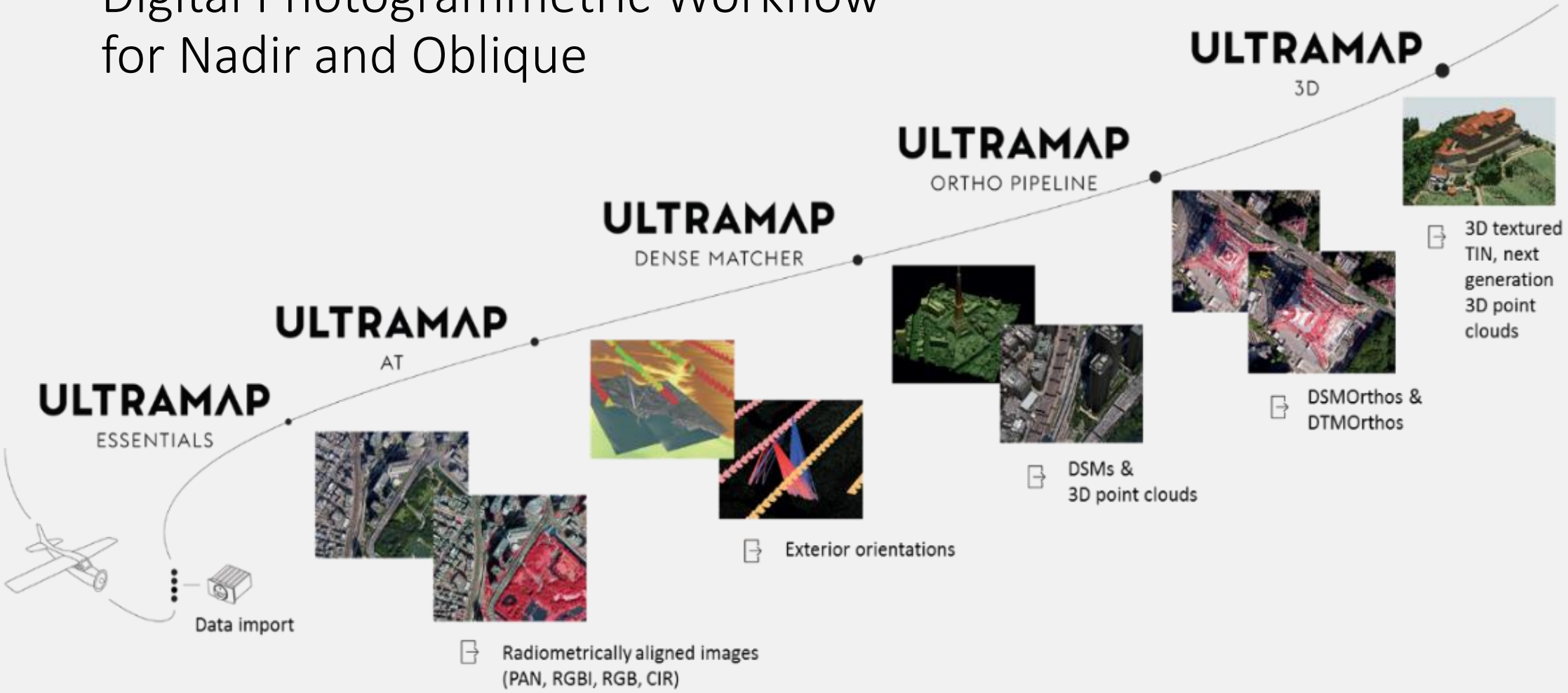
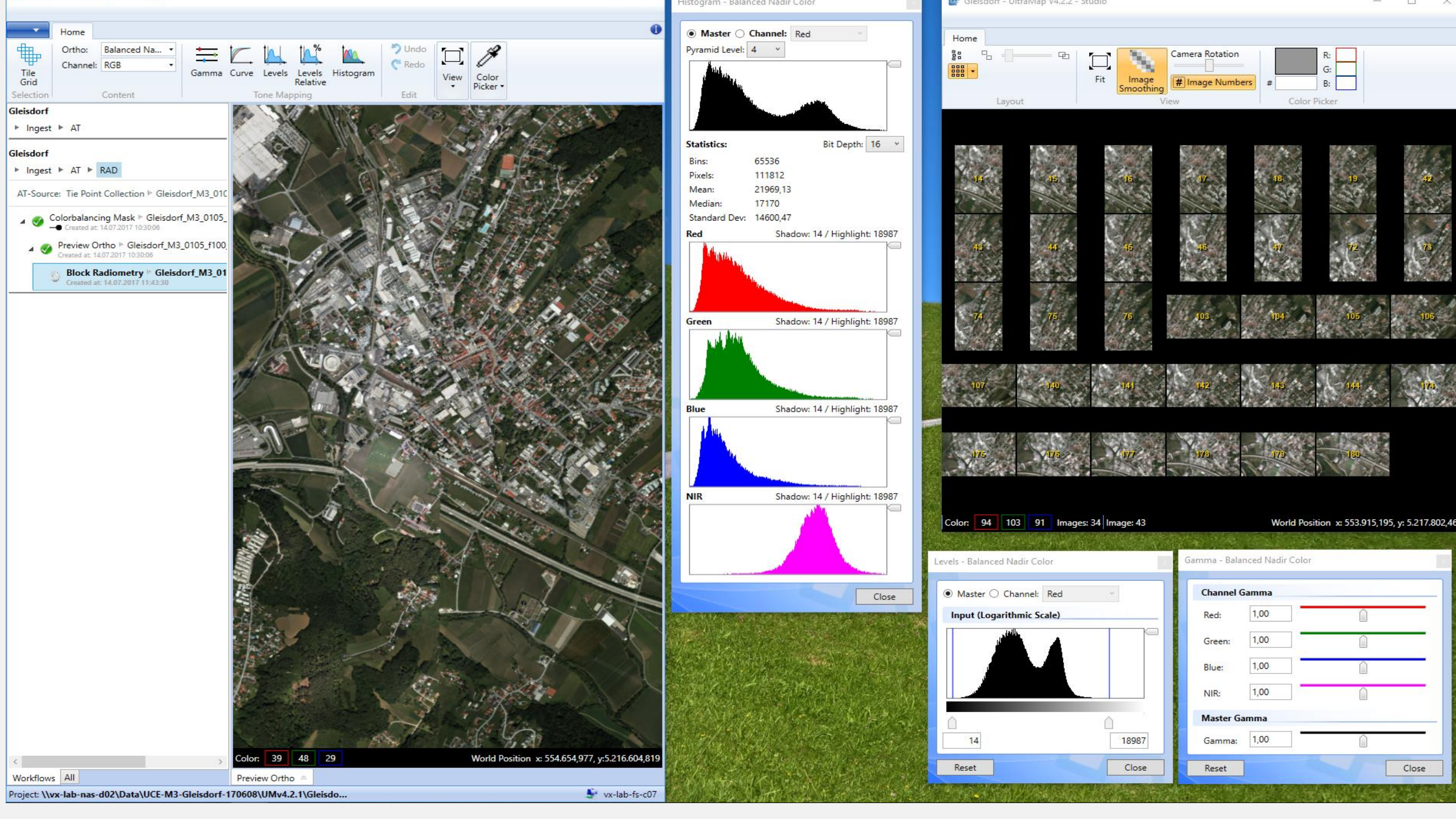


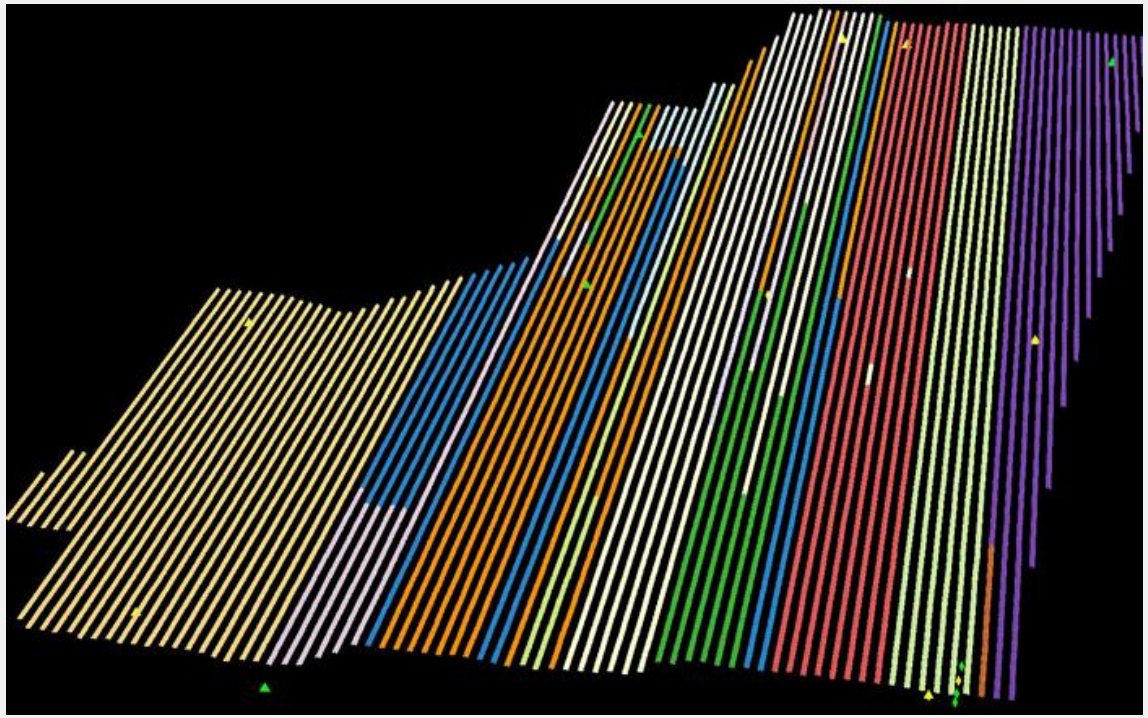
UltraMap V4

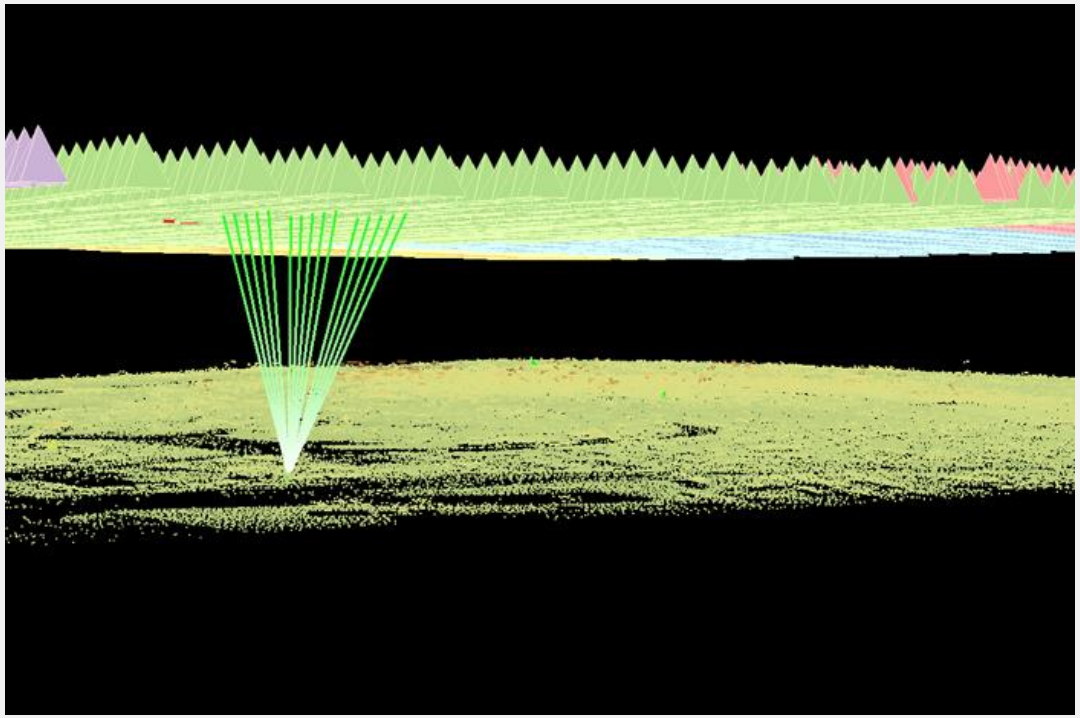
Digital Photogrammetric Workflow for Aerial and Terrestrial Application

- New intuitive GUI
- Oblique image processing and color balancing
- On the fly color adjustment
- 3D viewer
- UltraMap Terrestrial for UltraCam Mustang and Panther

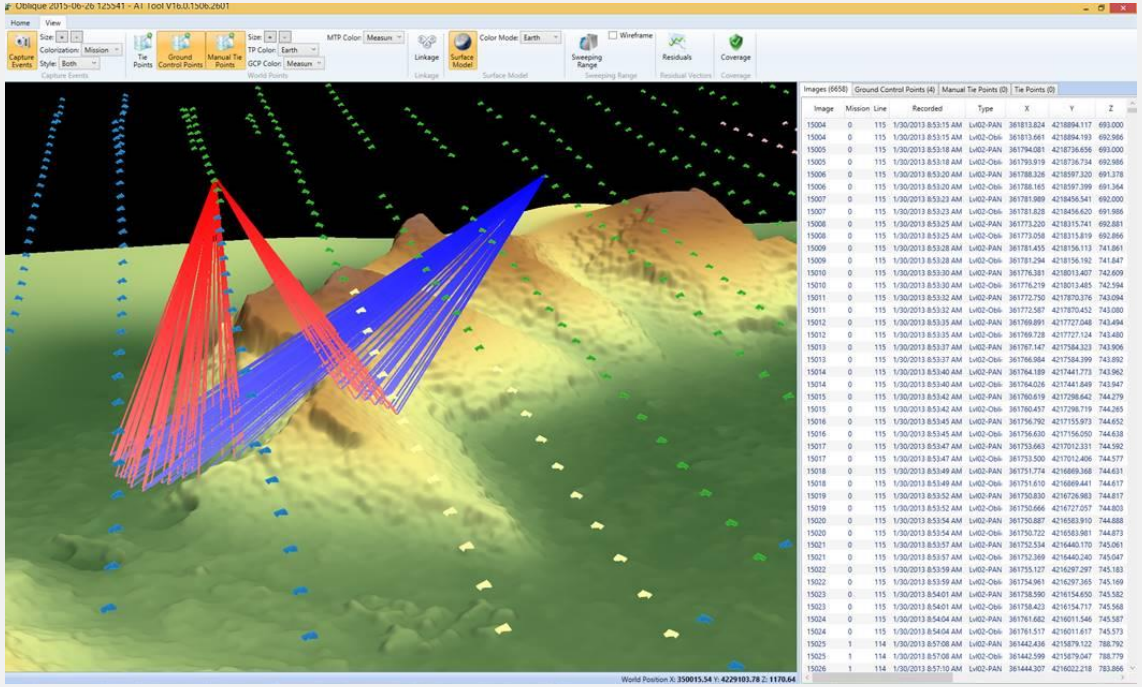

Home
Tile Grid
Selection
Ortho: Balanced Na...
Channel: RGB
Content
Gamma
Curve
Levels
Levels Relative
Histogram
Tone Mapping
Undo
Redo
Edit
View
Color Picker
Gleisdorf
Ingest AT
Gleisdorf
Ingest AT RAD
AT-Source: Tie Point Collection Gleisdorf_M3_010
Colorbalancing Mask Gleisdorf_M3_0105_
Created at: 14.07.2017 10:30:06
Preview Ortho Gleisdorf_M3_0105_f100_
Created at: 14.07.2017 10:30:06
Block Radiometry Gleisdorf_M3_01
Created at: 14.07.2017 11:43:30
Color: 39 48 29
World Position x: 554.654,977, y:5.216.604,819
Workflows All
Preview Ortho
Project: \\vx-lab-nas-d02\Data\UCE-M3-Gleisdorf-170608\UMv4.2.1\Gleisdo...
vx-lab-fs-c07
Histogram - Balanced Nadir Color
Master Channel: Red
Pyramid Level: 4
Statistics:
Bit Depth: 16
Bins: 65536
Pixels: 111812
Mean: 21969,13
Median: 17170
Standard Dev: 14600,47
Red
Shadow: 14 / Highlight: 18987
Green
Shadow: 14 / Highlight: 18987
Blue
Shadow: 14 / Highlight: 18987
NIR
Shadow: 14 / Highlight: 18987
Close
Home
Layout
Fit
Image Smoothing
Camera Rotation
Image Numbers
View
R:
G:
B:
Color Picker
Color: 94 103 91
Images: 34
Image: 43
World Position x: 553.915,195, y: 5.217.802,46
Levels - Balanced Nadir Color
Master Channel: Red
Input (Logarithmic Scale)
14
18987
Reset
Close
Gamma - Balanced Nadir Color
Channel Gamma
Red: 1,00
Green: 1,00
Blue: 1,00
NIR: 1,00
Master Gamma
Gamma: 1,00
Reset
Close

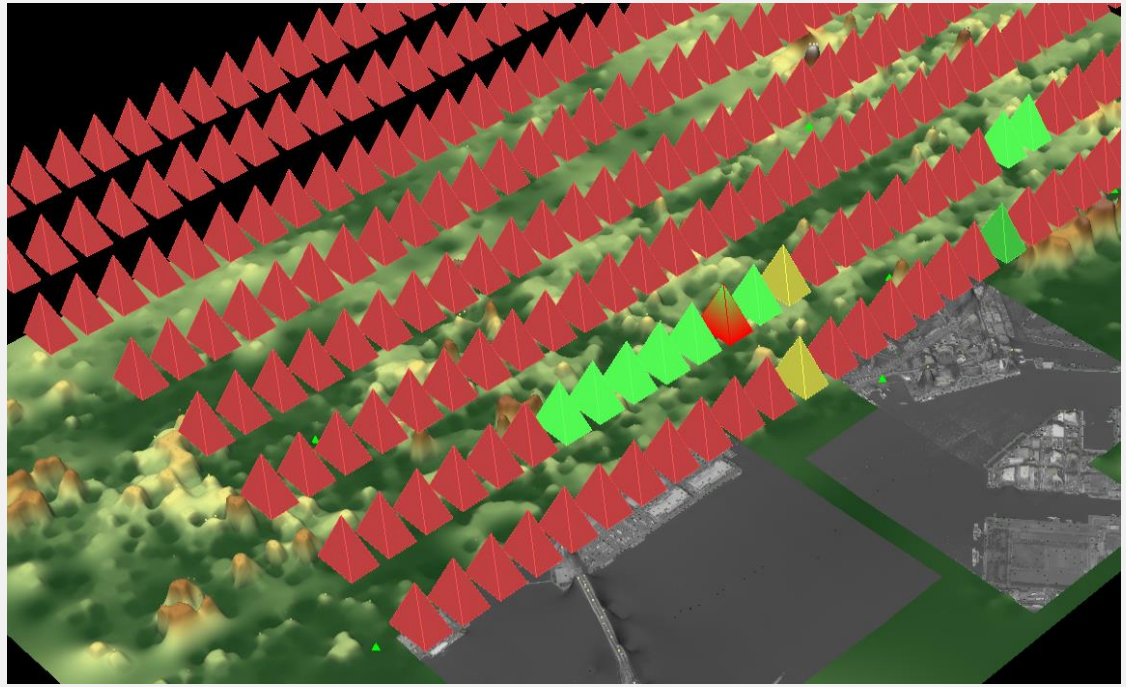
Visual Analytics – Large Block Visualization



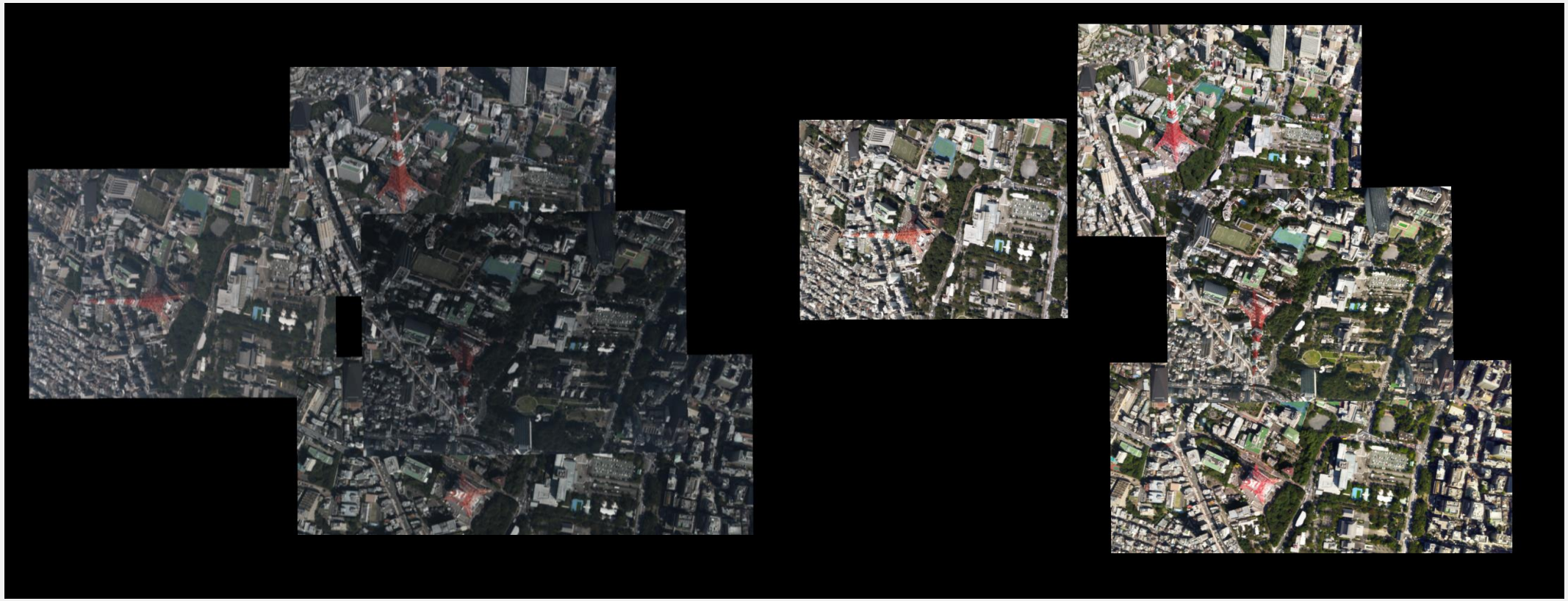


Visual Analytics – Built-in Terrain and Image Visualization





Simultaneous nadir/oblique color balancing



Raw

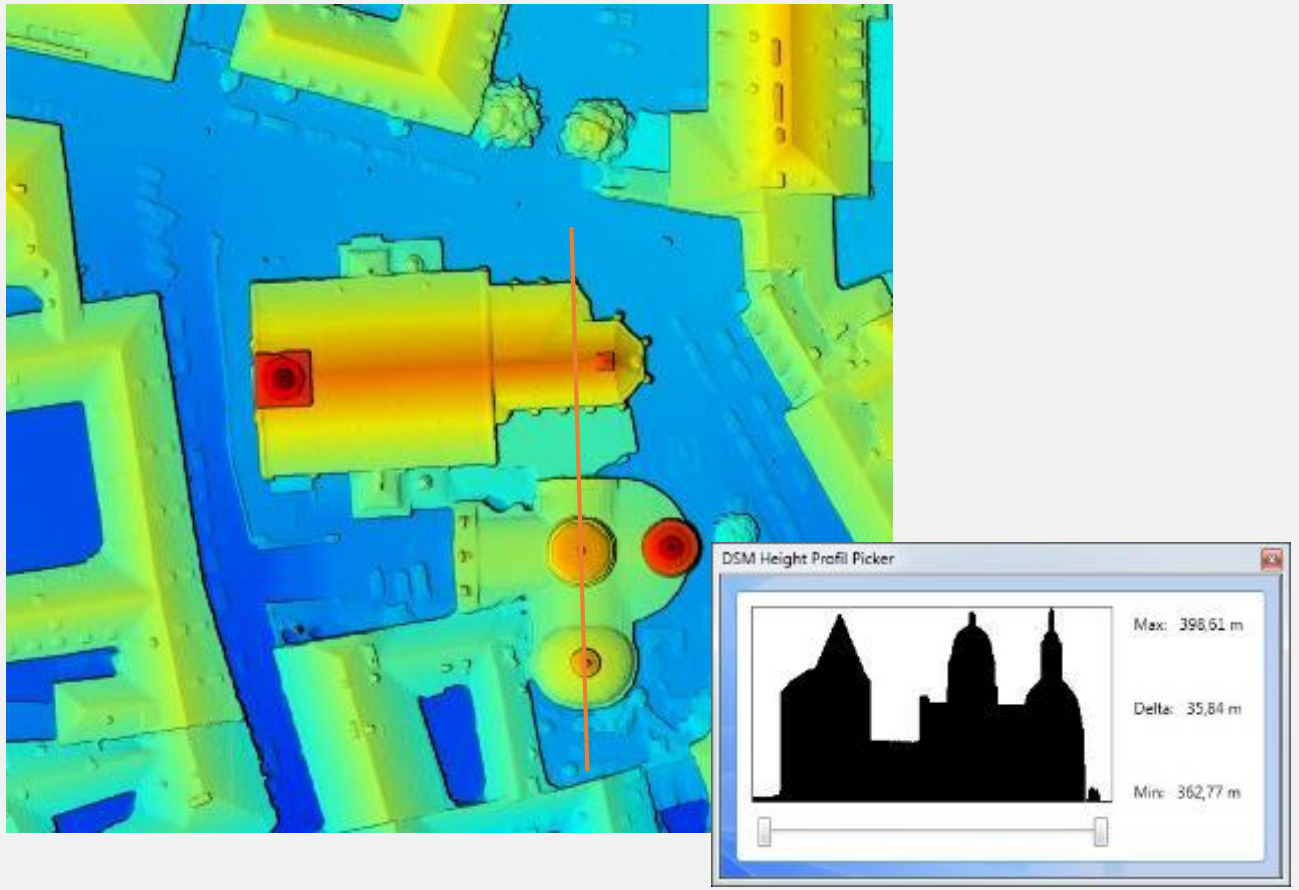
Balanced

Powerful dehazing of nadir/oblique images

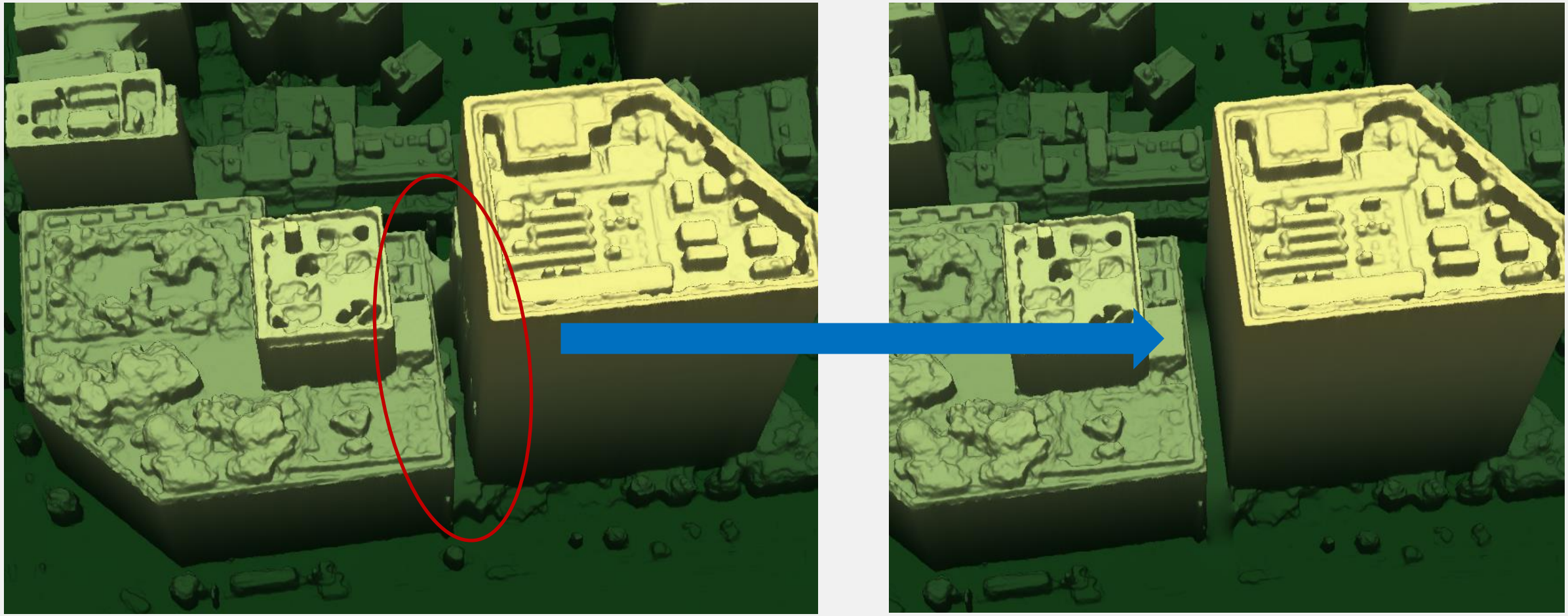
Automatic dense image matching

3D Point Cloud (RGB, RGBI, CIR)

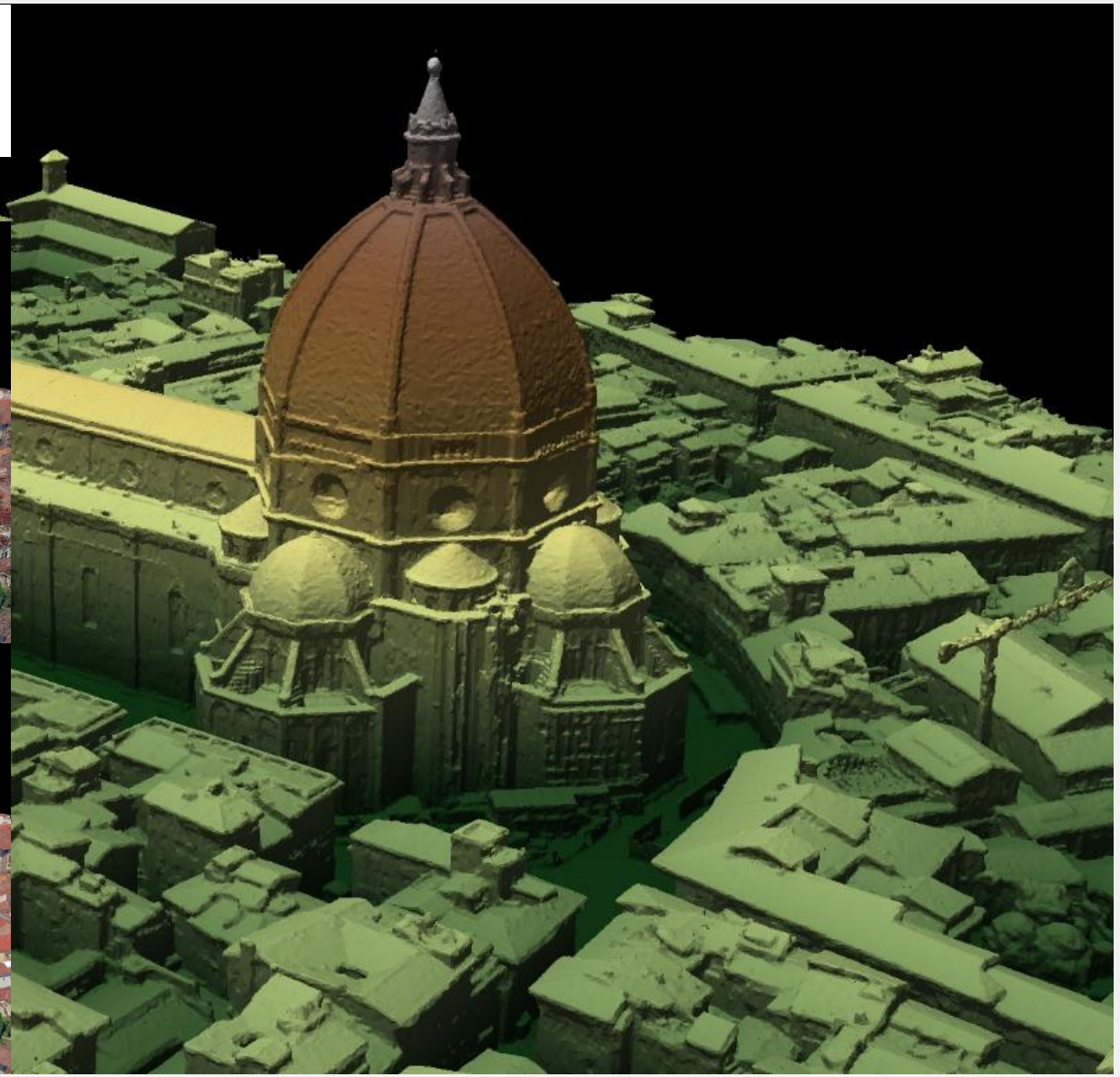
Digital Surface Model (DSM)



Innovative 3D Editor

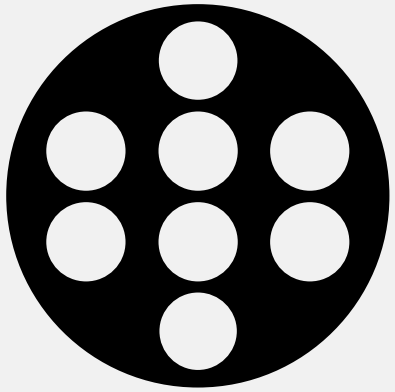


Precise 3D reconstruction: Point cloud, DSM/DTM, 3DTIN



Precise 3D reconstruction: 3DTIN

Precise 3D reconstruction:
3DTIN with undercuts



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