

# Újdonságok az ENVI, INPHO, UASMaster szoftverek tekintetében

Kákonyi Gábor  
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# Exelis Value Centers

## C4ISR Electronics & Systems (C4ISR)

### Electronic Systems



#### Providing Customers With:

The ability to sense and deny multispectral threats to manned and unmanned aircraft, ships, submarines, ground vehicles and personnel.

### Geospatial Systems



#### Providing Customers With:

Next-generation imaging that integrates space, airborne and ground sensors into broader, coordinated systems with advanced data analytics.

### Night Vision & Communications Solutions



#### Providing Customers With:

Networked communications and night vision systems, test and support capabilities, and interference mitigation solutions.

### Aerostructures



#### Providing Customers With:

Precision composite manufacturing and assembly solutions for complex aerospace applications, including primary airframe and wing structures, and components for missiles, spacecraft and engines.

## Information & Technical Services (I&TS)

### Information Systems



#### Providing Customers With:

End-to-end, full life-cycle provider of mission-critical network development and sustainment solutions.



# ENVI Products

IMAGERY AND DATA  
BECOME KNOWLEDGE

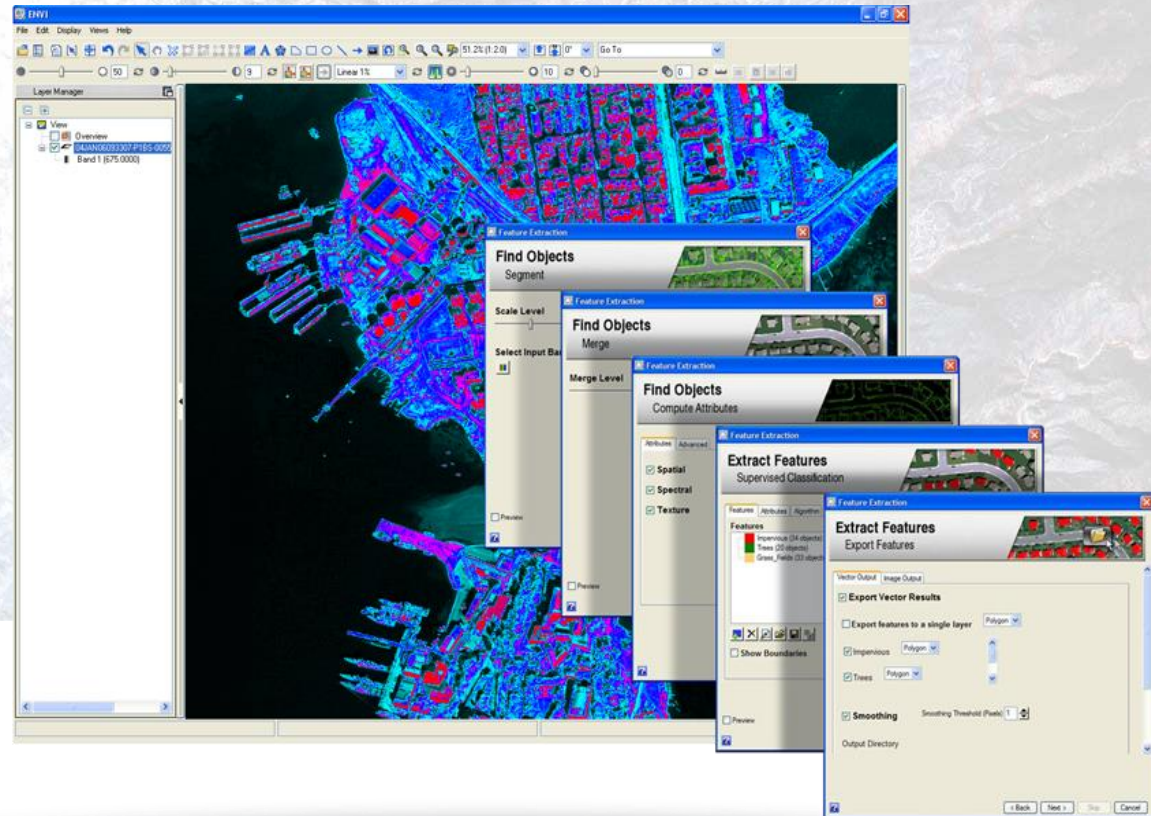
- > ENVI
- > ENVI | LiDAR
- > ENVI | SARscape
- > ENVI | Services Engine

# ENVI

IMAGERY AND DATA  
BECOME KNOWLEDGE

- > Add information from imagery to your GIS
- > **Automated workflows to get answers fast**
- > Easily navigate through menus and options
- > One solution for all the data types you use

## Automated workflows to get answers fast



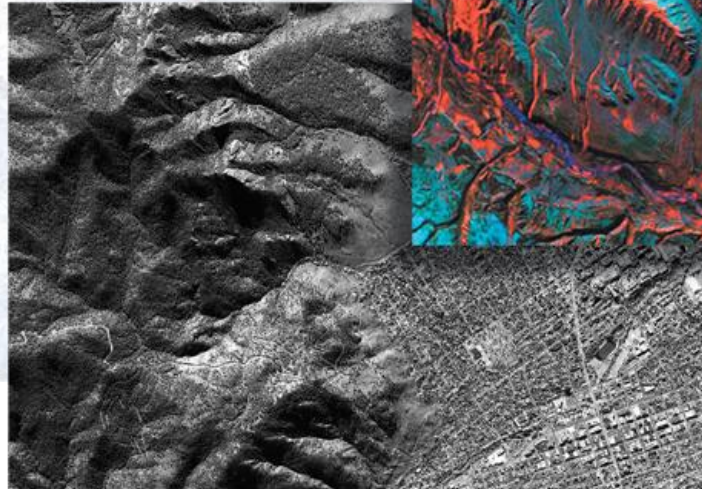
# One solution for all the data types you use

## ENVI

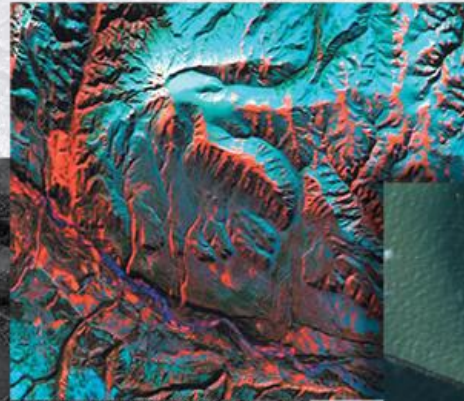
IMAGERY AND DATA  
BECOME KNOWLEDGE

- > Add information from imagery to your GIS
- > Automated workflows to get answers fast
- > Easily navigate through menus and options
- > **One solution for all the data types you use**

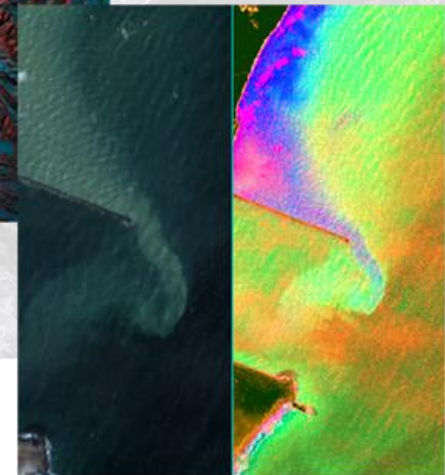
Panchromatic



Hyperspectral



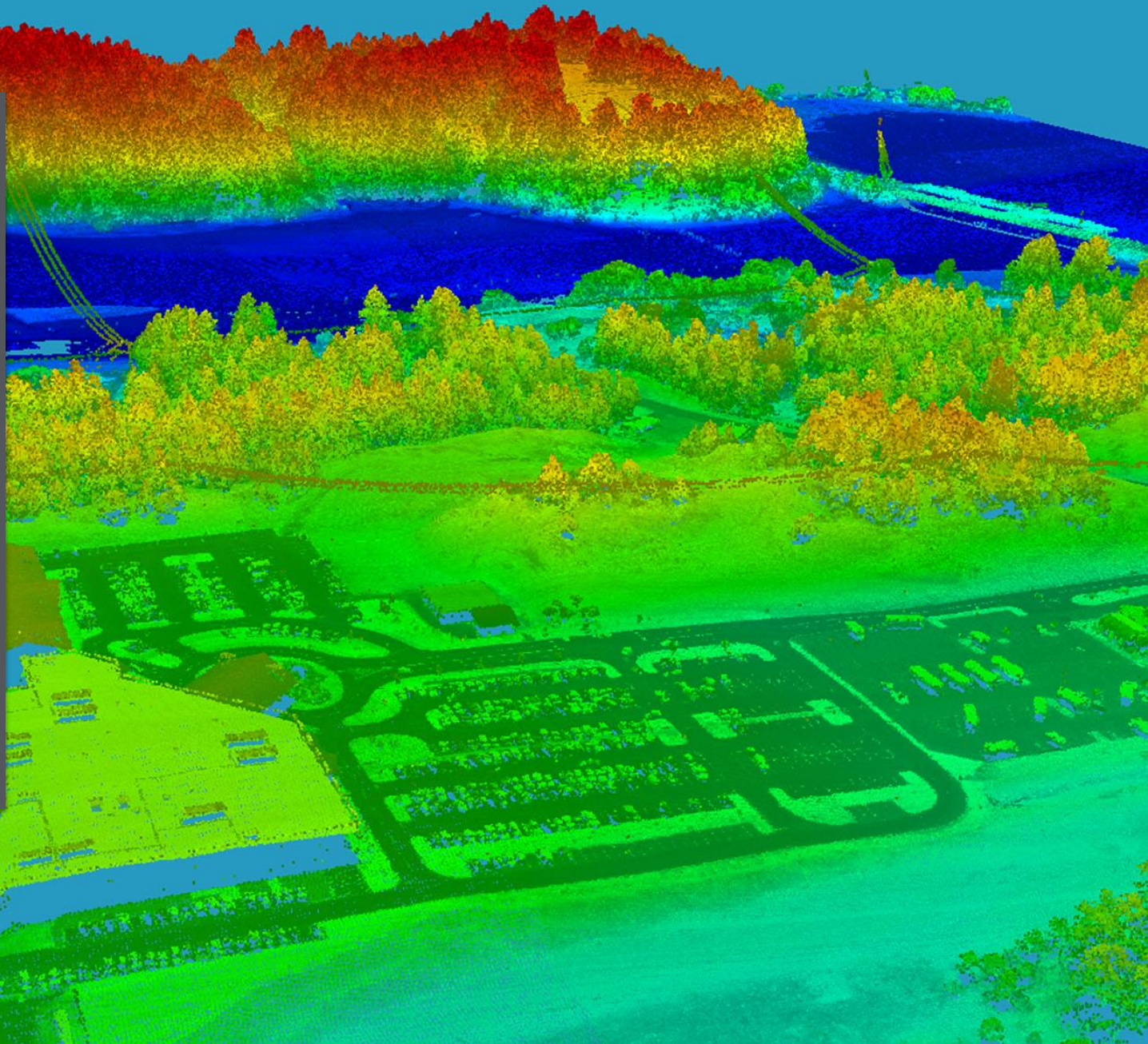
Multispectral



# ENVI LiDAR

IMAGERY AND DATA  
BECOME KNOWLEDGE

- > Prepare LiDAR Data for Geospatial Analysis
- > Identify & Extract 3D Features
- > Export Results to ENVI and ArcGIS



# ENVI Services Engine

ONLINE, ON-DEMAND,  
GEOSPATIAL AWARENESS

- > Configure seamlessly with your existing infrastructure
- > Create and publish web deployed image analysis tools
- > Consume ENVI from mobile, web, and thin clients
- > Get geospatial imagery where and when you need it

## ENVI Services Engine

### Create

### Deploy

### Access





# ENVI 5.2

## Újdonságok az 5.2-es verzióban

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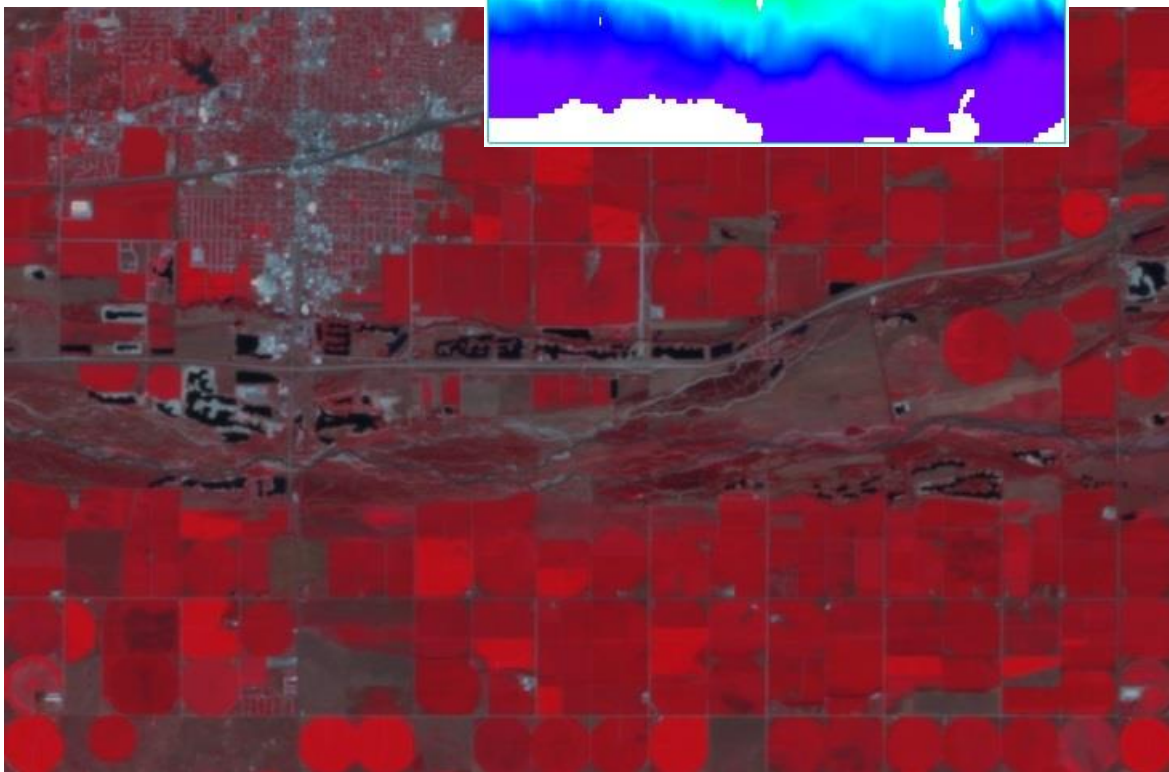
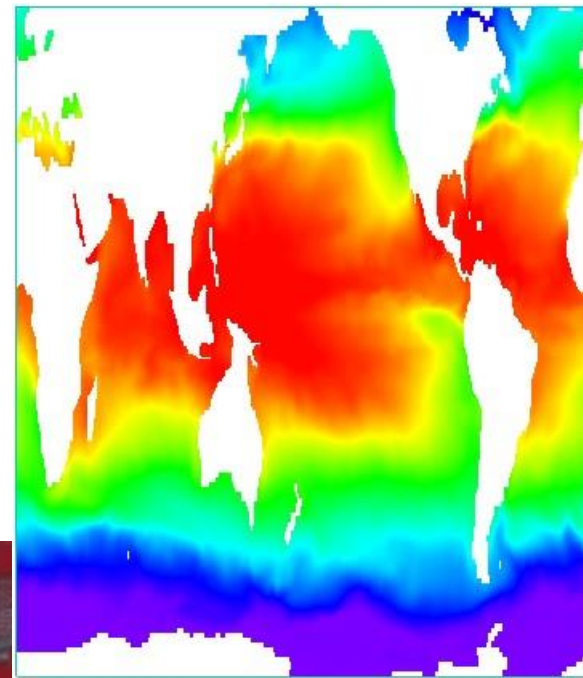
# ENVI 5.2 – Data Input

## > Format Input Support

- > GRIB-1/2
- > Multi-Page TIFF
- > NetCDF-4

## > Sensor Input Support

- > Alsat-2A
- > Deimos-1
- > Gaofen 1 (GF-1)
- > Proba-V
- > SkySat-1
- > WorldView-3
- > Ziyuan 1-02C (ZY-1-02C)
- > Ziyuan 3A (ZY-3A)

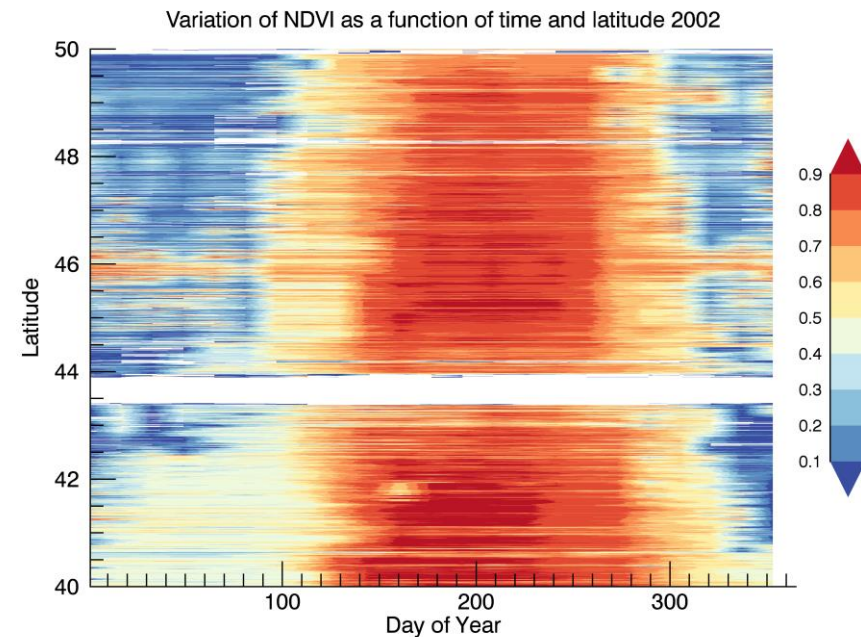
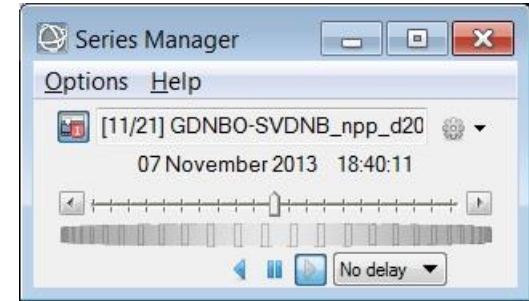


Deimos-1 image data courtesy of Airbus Defence & Space

# ENVI 5.2 – Spatio-Temporal Analysis

## > Time-Aware ENVI

- > Spatio-Temporal Analysis provides the ability to understand and predict Earth surface processes or human activities over space and time
- > Automatic ingest of “acquisition time” metadata for raster datasets
- > Ability to construct a stack of time-enabled rasters
- > View and animate a spatio-temporal series with time slider/wheel control
- > Raster animation (intra-file band & inter-file series/time)
- > Animation export to common video formats (.avi, .flv, .mp4, .webm, etc.)



# ENVI 5.2 – Display Tools

## > Full Motion Video Player

- > Support for FMV and Skybox (SkySat) video files-on-disk
- > Standard video playback controls (Play, Stop, Pause, Jump To Specific Time, Loop/Repeat, Time Slider, etc.)
- > Add/Save/Restore bookmarks, View at full resolution, Brightness control, Reverse color planes, Frame rate control
- > Full MISB compliant metadata support with additional functionality:
  - > Dynamic MISB metadata display, ArcGIS basemap, Current x,y location, Copy lat/lon, Rotate to north-up, Plot metadata fields, Google Earth export
- > Video frame export as static images:
  - > Export Individual Frame (i.e. grab a snapshot) to still image file-on-disk for exploitation within ENVI
  - > Export of a video file to a time-enabled raster series collection for spatio-temporal analysis

# FMV Player – MISB Metadata & Bookmarks

Full Motion Video: Video\_Clip\_2.mpg

Brightness Frame rate 1.0x

MISB Security Metadata	
Classification	UNCLASSIFIED//
Classifying Country	//CA
Coding Method	ISO-3166 Two Letter

MISB Metadata	
Event Start Time (µs)	0
Frame Center Elevation	1868.1146198511
Frame Center Latitude	41.120914198049
Frame Center Longitude	-104.85118198434
Generic Flag Data	0
Mission ID	ESRI_Metadata_Colle
Offset Corner Latitude P	41.120907331488
Offset Corner Longitude	-104.84909683884
Offset Corner Latitude P	41.119344044571
Offset Corner Longitude	-104.85133762638
Offset Corner Latitude P	41.120921064609
Offset Corner Longitude	-104.85306342189
Offset Corner Latitude P	41.122335576051
Offset Corner Longitude	-104.85103778658
Platform Call Sign	Firebird
Platform Designation	C208B
Platform Ground Speed	0
Platform Heading (deg)	228.04119930603
Platform Pitch (deg)	2.9218420982361
Platform Roll (deg)	-10.850690841675
Platform Tail Number	N97826
Sensor Horiz FOV (deg)	7.7674525044858
Sensor Vert FOV (deg)	4.3671320658177
Sensor Latitude (deg)	41.130384994266
Sensor Longitude (deg)	-104.86272746924
Sensor True Altitude (m)	2945.7845173776
Sensor Rel Azimuth (deg)	267.53125018791

19SEP2012 AUTO SPA EOW 71 AUTO 123  
 14:49:21  
 UTC-6:0  
 OFF NONE  
 ACFT 41.13047N 229° 25 26 27 28 29 TGT  
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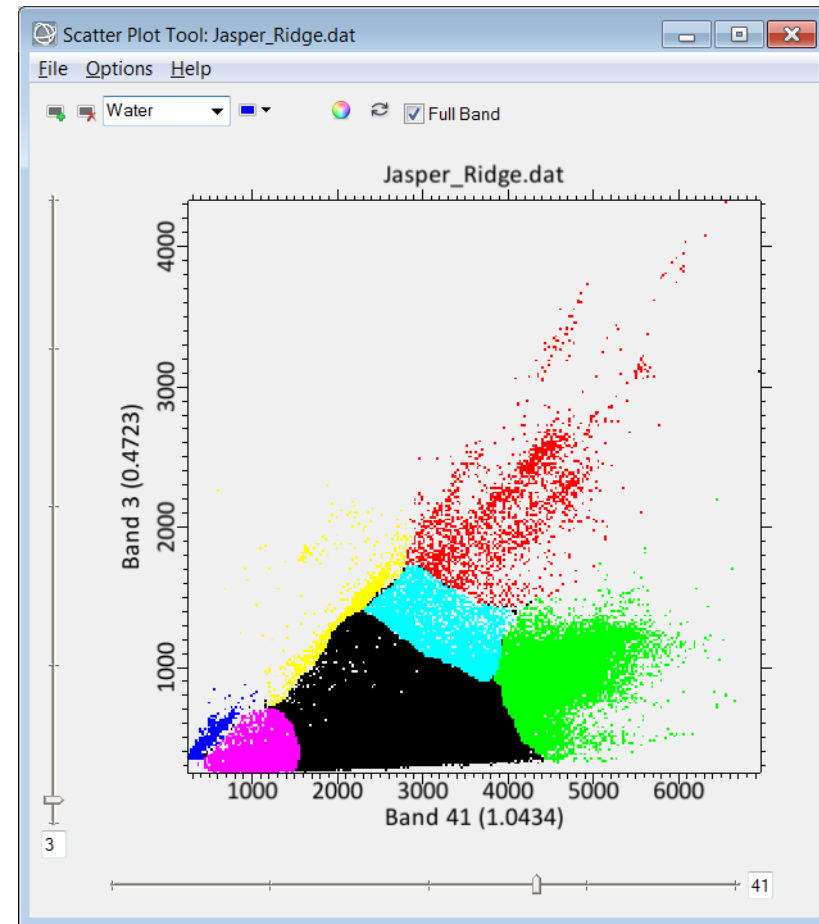
Time: 00:00:54 of 00:02:29 Pixel location: 953,540 Lat/Lon: 41.120920N, 104.851172W

- 00:00:23.84
- 00:01:06.32
- 00:01:28.71
- 00:02:21.89
- Delete Bookmarks
- Restore Bookmarks
- Save Bookmarks

# ENVI 5.2 – Interactive Analysis Tools

## > Completely new 2D Scatter Plot

- > Now matches all functionality available in Classic's 2D Scatter Plot
- > 2D scatter plot now has its own manipulator on the application toolbar
- > Uses modern graphical system with improved plotting quality & flexibility
- > Excellent performance when working with large images (e.g. dancing pixels)
- > Improved band selection methodology with interactive axis sliders
- > New "Dancing Layers" functionality where both the Scatter Plot and the Image window highlight the value that corresponds to the cursor location



# ENVI 5.2 – Interactive Analysis Tools

## > Completely new Feature Counting Tool

- > New table display of features with ability to Sort and list with Color text
- > Ability to turn Symbol, Label and Count on/off in the display
- > User control of Feature plotting properties with many new symbols
- > For georeferenced rasters geolocation is automatically gathered
- > Time metadata and optional Description field for each Feature
- > Feature Counting using a Grid option
- > Ability to save/export features to ENVI Feature Counting, Shapefile and GDB

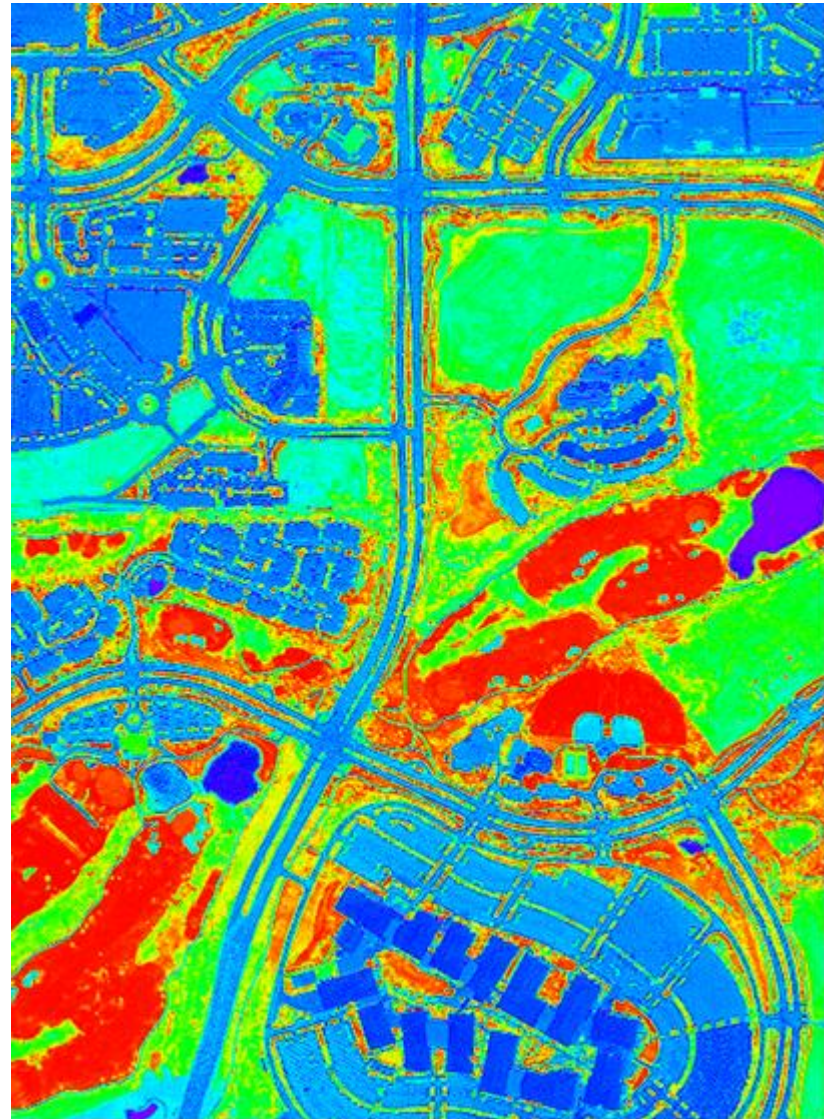


	Feature	Grid	Count	Latitude	Longitude	MGRS
29	Helicopter	A1	8	31.49875389	65.84034384	41RQQ697858837
30	Helicopter	A1	9	31.49862062	65.84008612	41RQQ697618835
31	Helicopter	A1	10	31.49840592	65.83981367	41RQQ697368833
32	Helicopter	A1	11	31.49828006	65.83953386	41RQQ697108832
33	Helicopter	A2	1	31.49780624	65.83877542	41RQQ696398826
34	Helicopter	A2	2	31.49766558	65.83852507	41RQQ696168824
35	Fuel Depot	A1	1	31.50007910	65.84206689	41RQQ699458852
36	Aircraft	A1	1	31.49868725	65.84074883	41RQQ698248836
37	Hangar	A2	1	31.49782845	65.84222152	41RQQ699678827
38	Hangar	A1	1	31.49805796	65.84241297	41RQQ699848830
39	Hangar	A1	2	31.49818382	65.84265597	41RQQ700078831
40	Hangar	B1	1	31.49831708	65.84290633	41RQQ700308833
41	Hangar	B1	2	31.49820603	65.84427593	41RQQ701618832

# ENVI 5.2 – Processing Tools

## > Spectral Indices

- > Simple tool that provides ability to compute 64 common spectral indices from EO/IR multi-band (MSI or HSI)
- > Computation of spectral indices where band ratios using two or more bands are used to accentuate the spectral differences between materials
- > Ability to dynamically Preview the processing result before execution
- > Implementation is multi-threaded with high performance processing
- > Examples: NDVI, RDVI, LAI, EVI, SAVI, SR/RVI, BAI, WorldView-specific, etc.



## ENVI 5.2 – Processing Tools

### > **NNDiffuse Pan-Sharpening**

- > Algorithm developed at RIT Digital Imaging and Remote Sensing (DIRS) Laboratory
- > Support for popular satellite sensor platforms (e.g. Landsat 8, SPOT, WorldView-2/3, Pléiades-1A/1B, QuickBird, GeoEye-1, EO-1 ALI, IKONOS, DubaiSat-1/2, NigeriaSat-2, etc.)
- > Implementation is multi-threaded with high performance processing
- > Excellent image quality with preservation of color and spectral fidelity
- > API for batch processing and ENVI Services Engine for server deployments







transforming the way the world works



# Trimble Geospatial

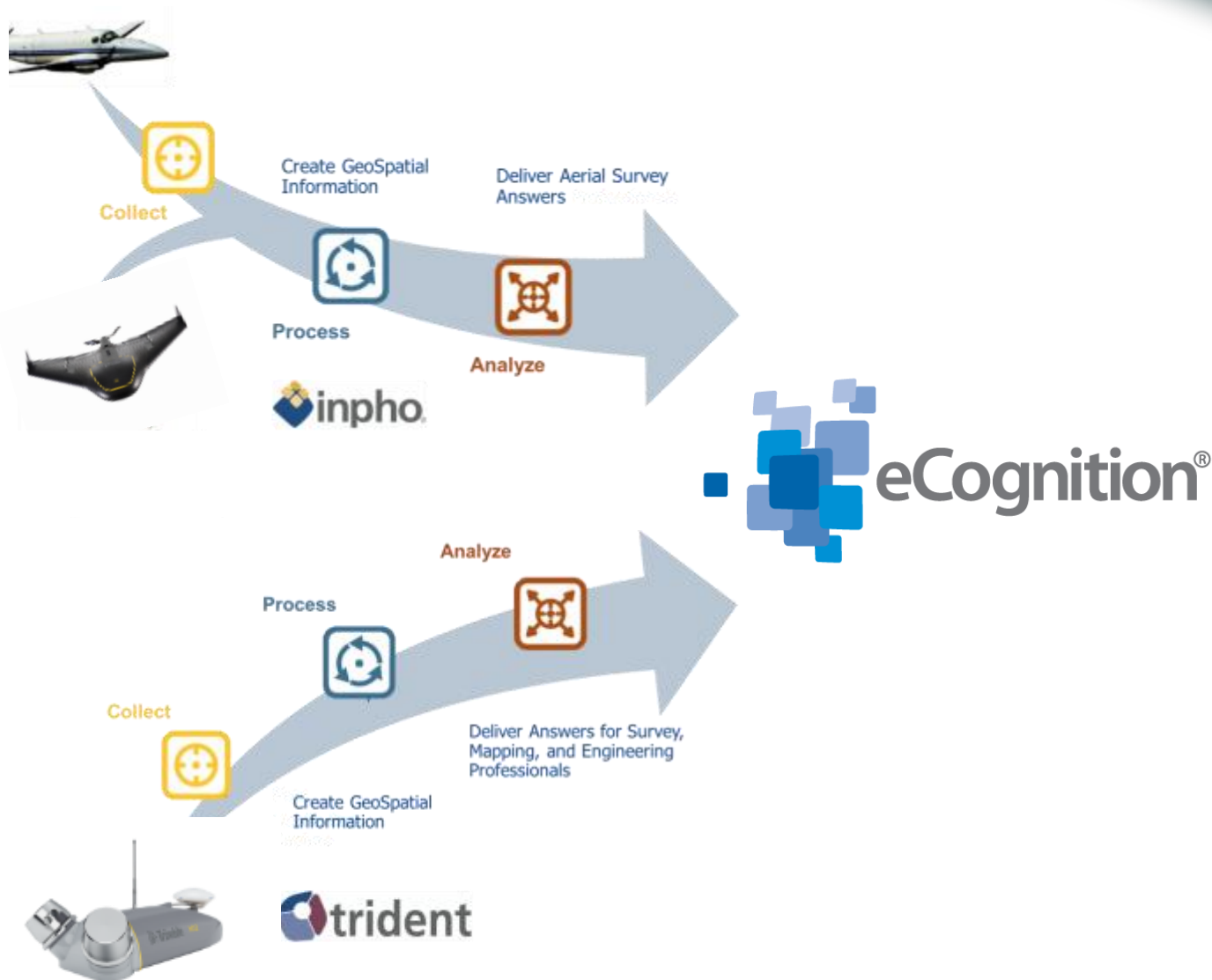
# transforming

THE WAY THE WORLD WORKS

- Company founded in 1978
- Publicly traded on the NASDAQ since 1990
- 2013 Revenue \$2.5 Bn; 6,700 employees
- Customers in 150+ countries
- Transforming industrial work processes through integrated positioning, communications and information technologies

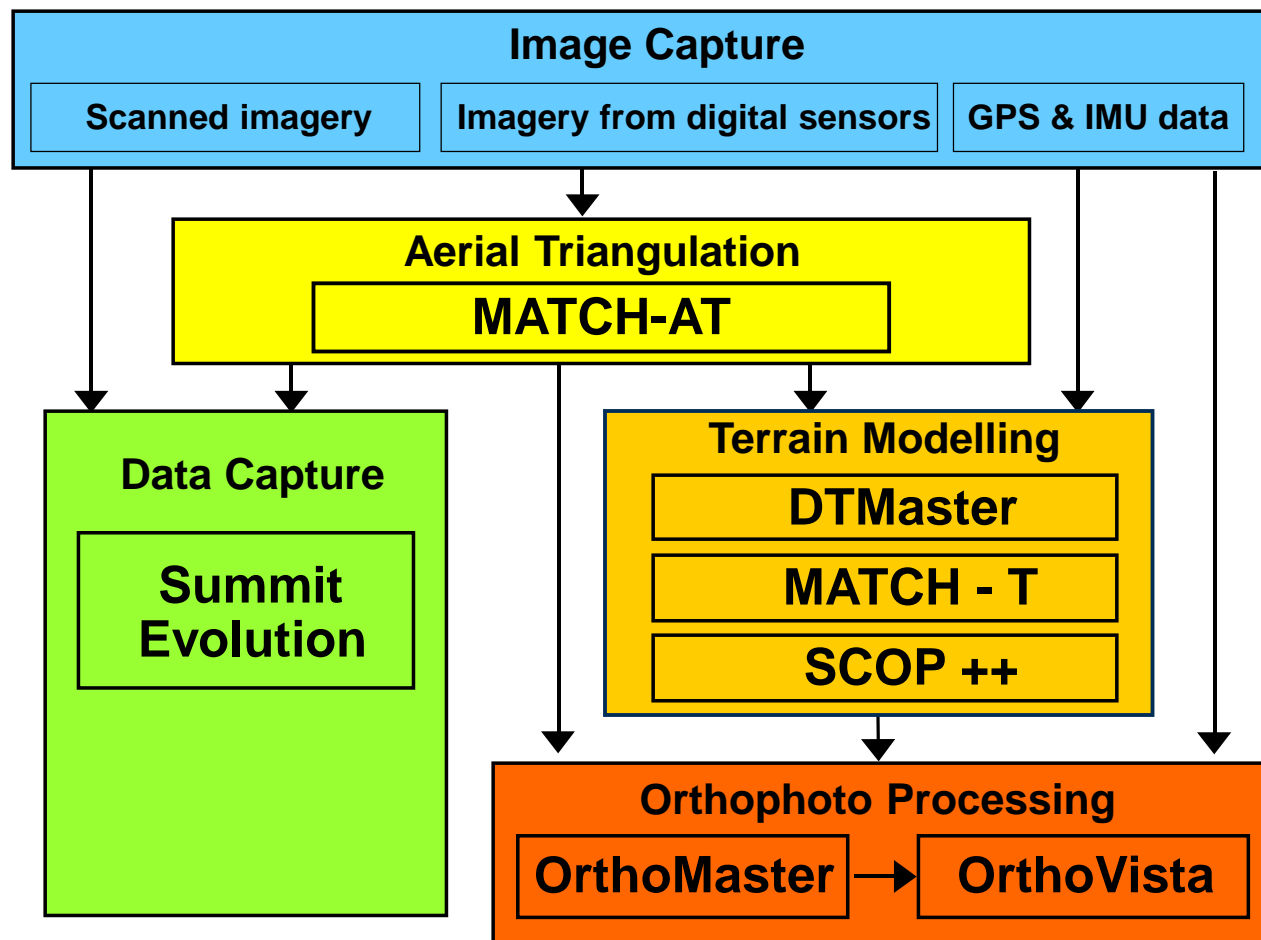


# Trimble Workflow

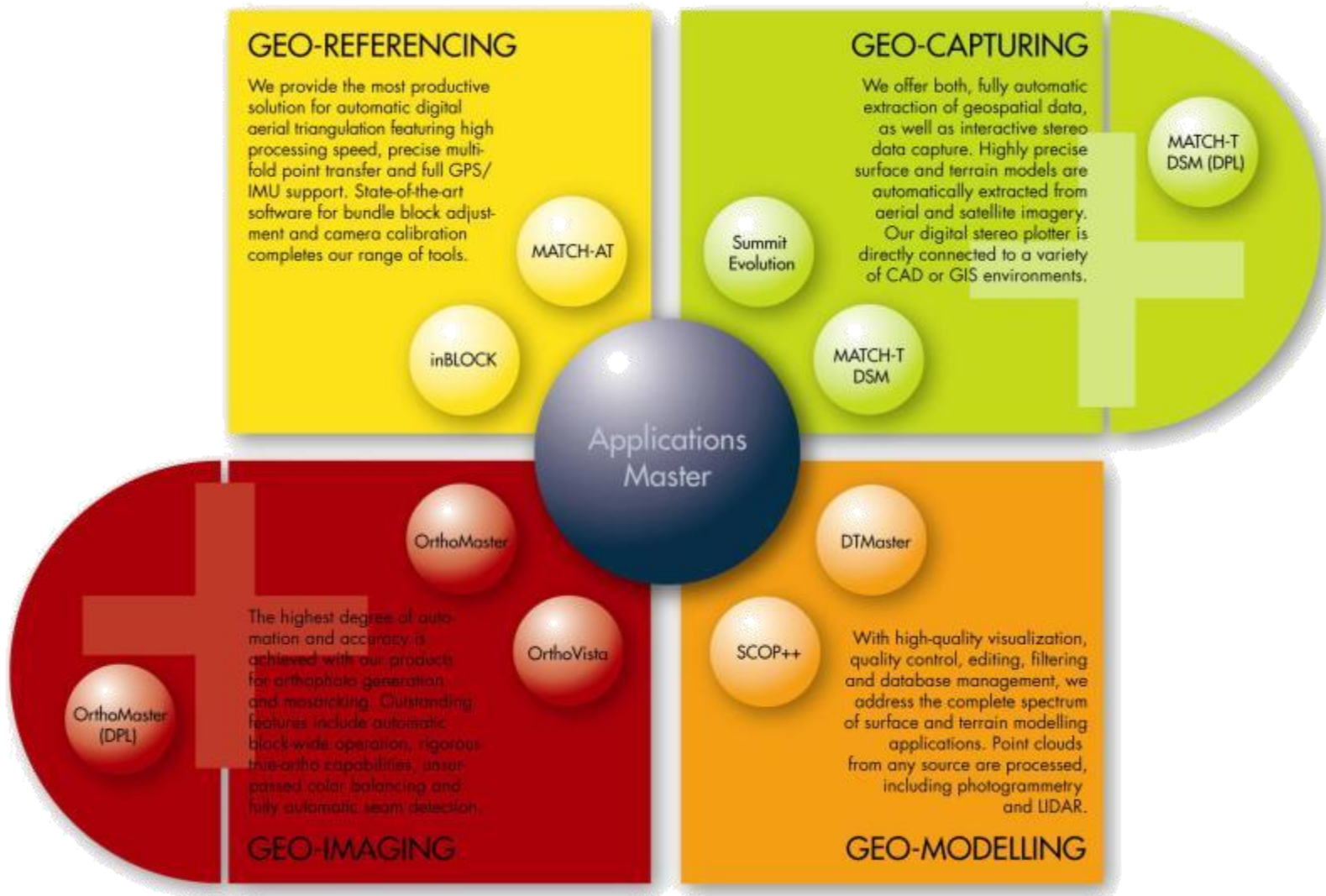


# Digital Photogrammetric Workflow

## Photogrammetric Workflow – The INPHO Approach



# INPHO's Modular System



# INPHO 6.0

- A new version 6.0 release is now available for all Inpho modules, UASMaster and SCOP++ (Hotfix).
- The new version includes a number of enhancements such as
  - a support for a wider range of data formats (input/output),
  - new automatic and interactive tools, and
  - satellite triangulation functionality

# INPHO 6.0

- **A new Satellite Triangulation functionality which is available inside MATCH-AT**
- **The new functionality offers users a full automatic georeferencing engine for positioning refinements of satellite data. From agriculture to wide area mapping, satellite scenes are available almost everywhere and are more and more commonly used.**

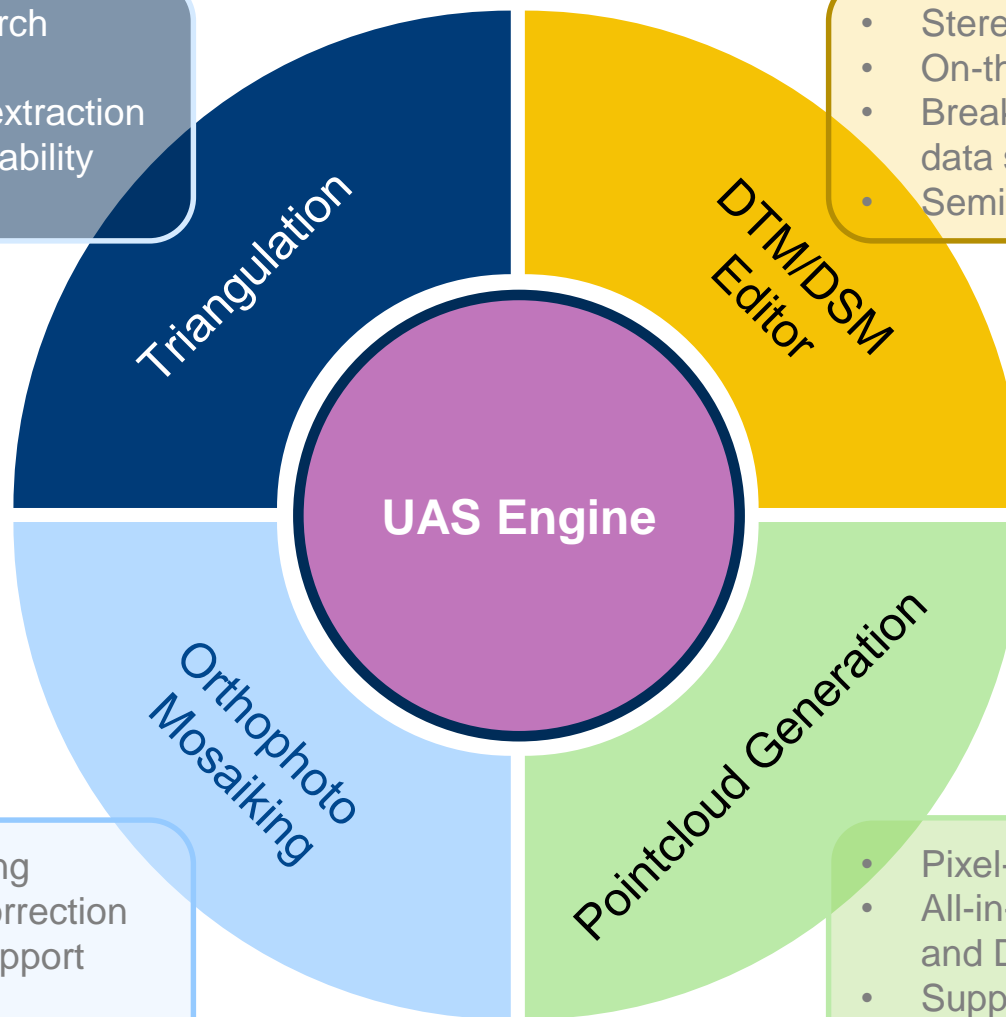
# INPHO 6.0

- **Better point clouds**
- **The demand of extremely dense point clouds with rich detail and high planimetric and vertical precision sets the standards for point cloud generation software. In version 6.0 MATCH-T as well as UASMaster benefit from a thorough revision of internal matching strategies. Surface models gain in accuracy with lower noise by keeping an extreme amount of detail. With only a little of extra computation time a much better result can be accomplished.**



# UASMaster

- Graphical Error Search Functionality
- Automatic tie point extraction with interactive operability



- Stereo editing
- On-the-fly data control
- Breakline and morphological data support for processing
- Semi-automatic editing tools

- Automatic Mosaicking
  - Radiometry correction
  - True-Ortho Support
- Automatic Seamline Generation

- Pixel-based and FB matching
- All-in-one solution for DTM and DSM generation
- Support of morphological data

# UASMaster 6.0 jellemzők

- Multi-camera support (cameras up to 40 MP)
- Better point clouds in version 6.0 MATCH-T as well as UASMaster benefit from a thorough revision of internal matching strategies.
- Georeferencing: 10 seconds per image
- • Point cloud matching: 3 seconds per image
- • Ortho mosaicking: 4 seconds per image
- • Reprojection error typically less than 1 pixel
- • Height accuracy about 1–2 pixels

# Köszönöm a figyelmet!

- [www.geoiq.hu](http://www.geoiq.hu)
- Tel: +36 30 931 0626.