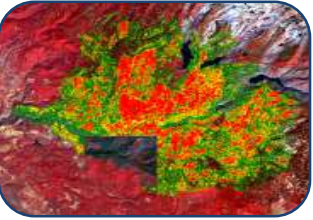# KÉPFELDOLGOZÁS, FOTOGRAMMETRIA, ENVI, ECOGNITION, INPHO, UASMASTER ÚJDONSÁGOK 2019-BEN

KÁKONYI GÁBOR, GEOIQ IMAGING KFT.

www.geoiq.hu   Tel: +36309310626

HARRIS® TECHNOLOGY TO CONNECT, INFORM AND PROTECT™
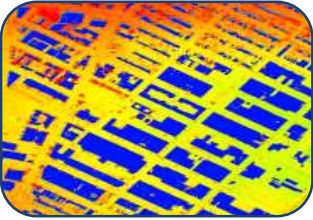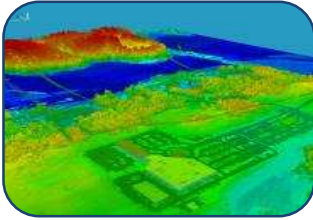
Analytics to Answers with ENVI + IDL Platform

ENVI

Photo-grammetry
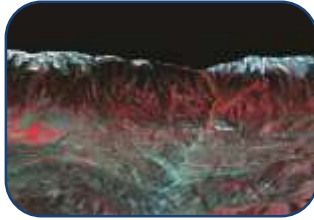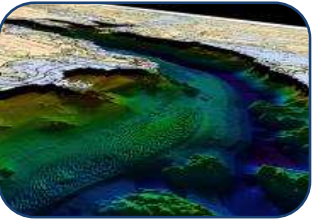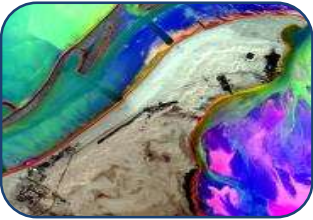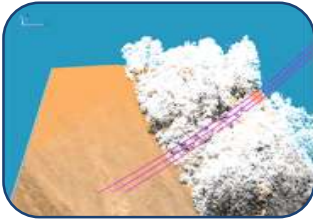
Feature Extraction

DEM Extraction

Atmospheric Correction

SARscape Suite of Tools

NITF Data
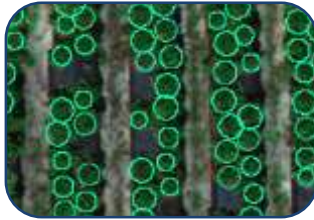
Crop Science

ENVI Engine
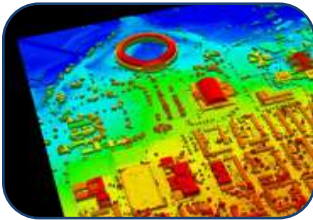
ENVI OneButton

IDL Extensibility

We are continuously updating our products to bring you answers that you can trust…

ENVI - The leader in image science

Planned defense merger *"Harris Corporation and L3 Technologies to Combine in Merger of Equals to Create a Global Defense Technology Leader"* L3 Harris Technologies, Inc., will be the 6th largest defense company in the U.S. and a top 10 defense company globally, with approximately 48,000 employees and customers in over 100 countries .

ENVI can be deployed and accessed from the desktop, in the cloud, and on mobile devices, and can be customized through an API to meet specific project requirements.

ENVI Capabilities Overview

ENVI image analysis software uses scientifically proven analytics to deliver expert-level results. Businesses and organizations choose ENVI because it integrates with existing workflows, supports today's most popular sensors, and can easily be customized to meet unique project requirements.
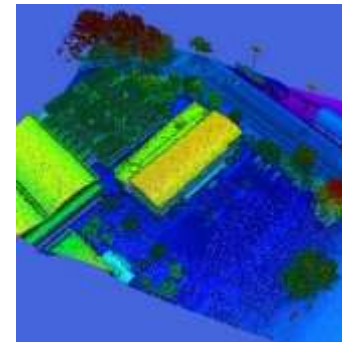
ArcGIS® Integration

▪

Workflows and automated tools open in the ArcToolbox® and results can be pushed directly to ArcMap, run as GP tools in ArcGIS Pro, or ArcGIS Online

Workflows

▪

ENVI workflows automate popular image analysis tasks such change detection, anomaly detection, viewshed analysis, and many more.

Extensible

▪

Combine multiple tools, including image analysis functionality, to create new custom image analysis capabilities based on desired outcomes.
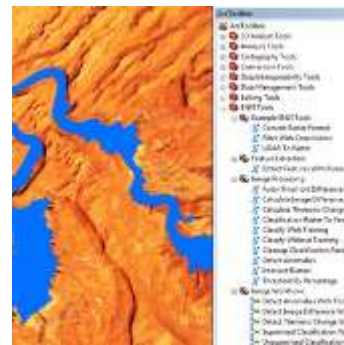
Data Support

▪

ENVI works with any size data set and has automated tools to quickly and easily prepare big and small imagery for viewing and further analysis.

New Earth Observation Satellite Support

FormoSat-5 Panchromatic

Pan-sharpened

Formosat-5 is an Earth observation satellite operated by the National Space Organization of Taiwan

Alsat-1B is an Algerian satellite for agricultural and disaster monitoring

Analysis-ready PlanetScope Reflectance Data support

MIE4NITF: Time-Series Enabled NITF Imagery

View and analyze time series of images for change detection, tracking patterns and movement, and activity-based intelligence.

MIE4NITF promises HD resolution, high frame rates, and rich metadata content.
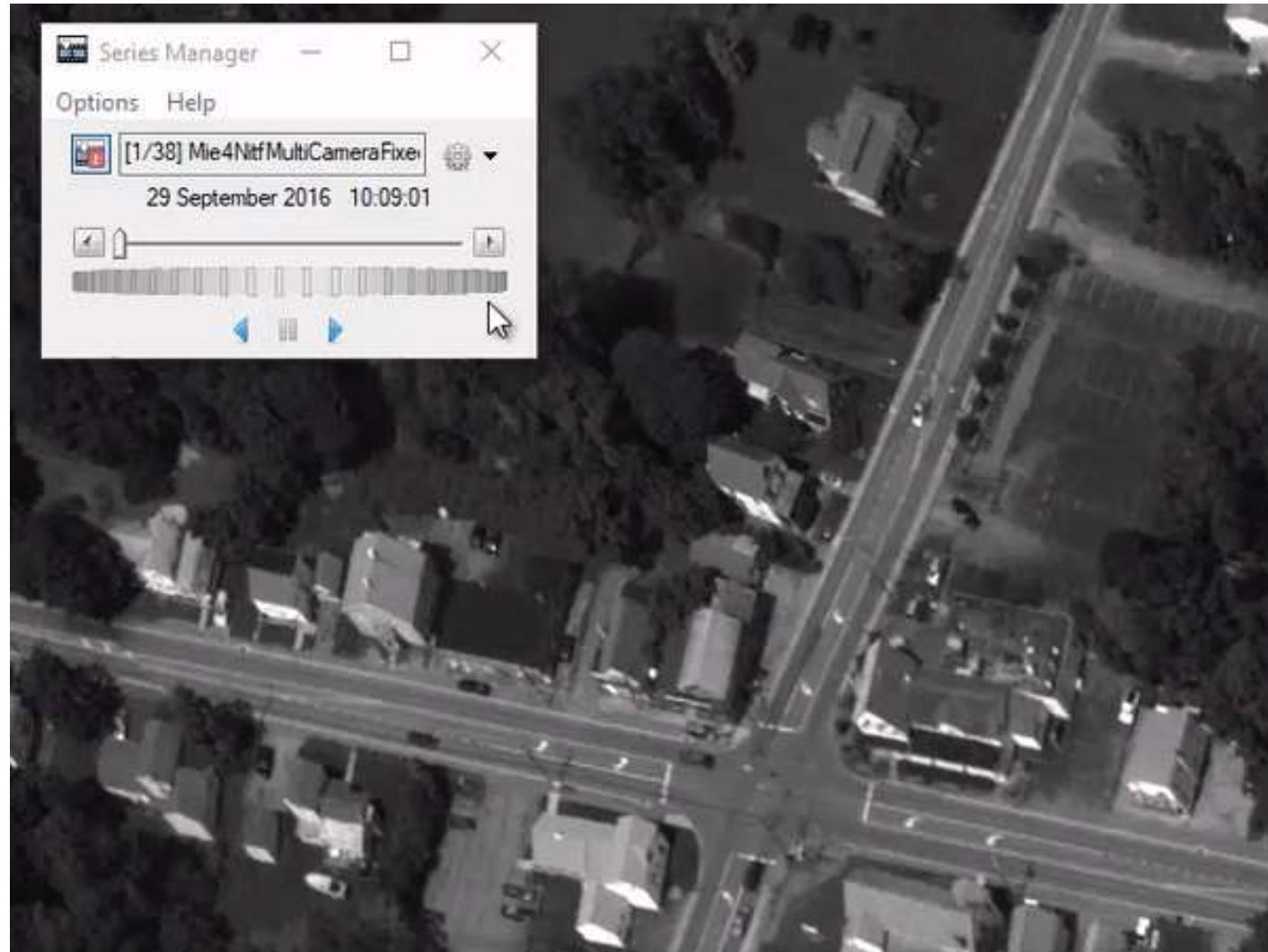
ENVI is one of the first commercial software products to support the newest standard, MIE4NITF.

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Topographic shading allows the user to more readily inspect and identify characteristics and anomalies in 3D data.

This level of resolution, combined with unique illumination angles, makes it easy to identify roads, trails, and streams.

Color-blended hillshade image of a subset of the DEM at 1/9-arc-second resolution.

New Topographic Shading Tool

- Blend topographic features with a DEM: slope, aspect, profile convexity, plan convexity, longitudinal convexity, and more

- Choose a predefined color ramp or create your own.

- Can use red/green/blue (RGB), hue/lightness/saturation (HLS), or hue/saturation/value (HSV) color models

- Use a HLS color model for the DEM instead of the default RGB color model.

- The HLS and HSV models create highlights and shadows and give the blended image a glossy or "wet" effect.

Multi-directional hillshade image of the Appalachian DEM subset, 45º elevation, Gaussian stretch applied.

New Open Street Maps Capability in ENVI

Download, open, and display OpenStreetMap vectors within ENVI.
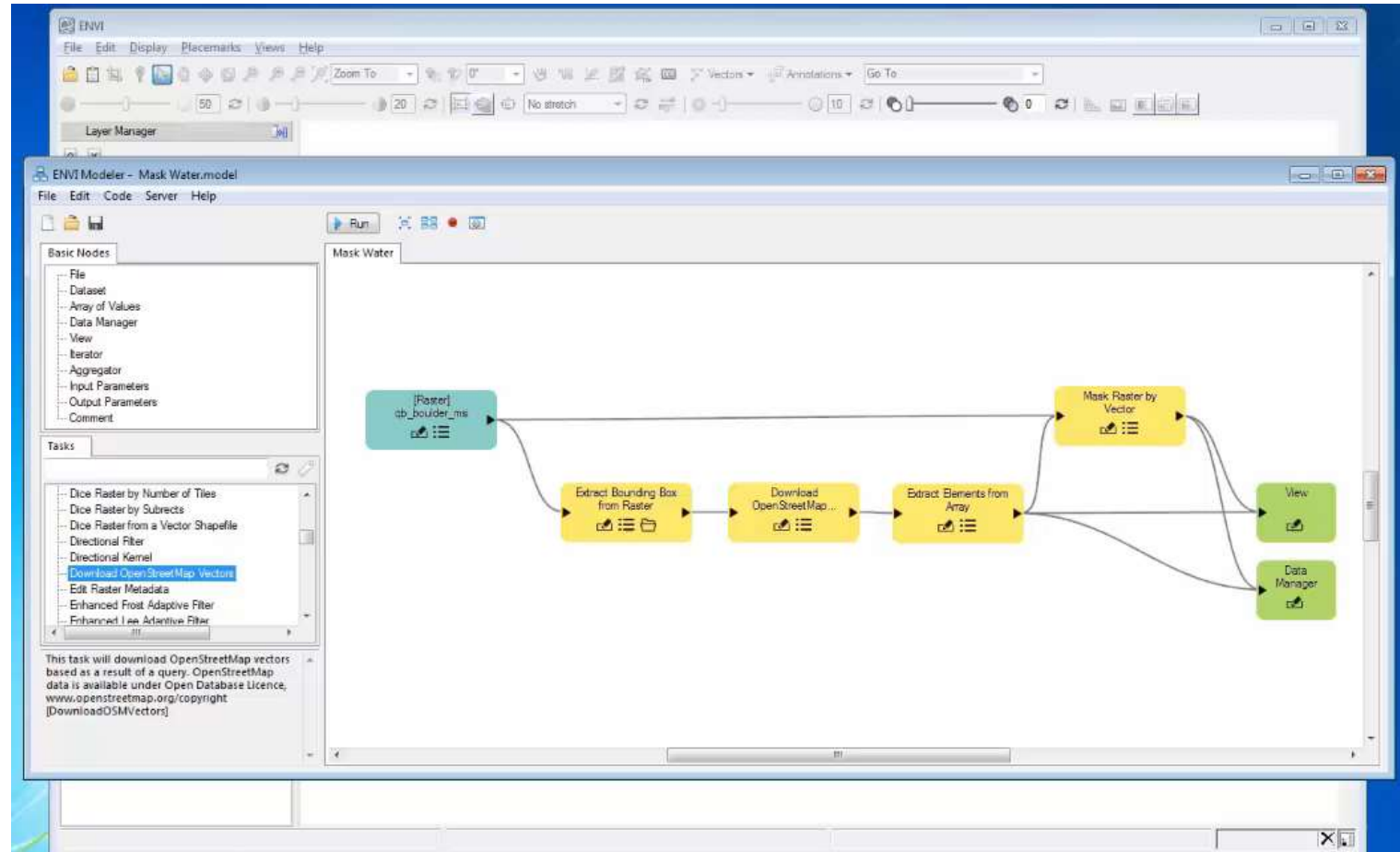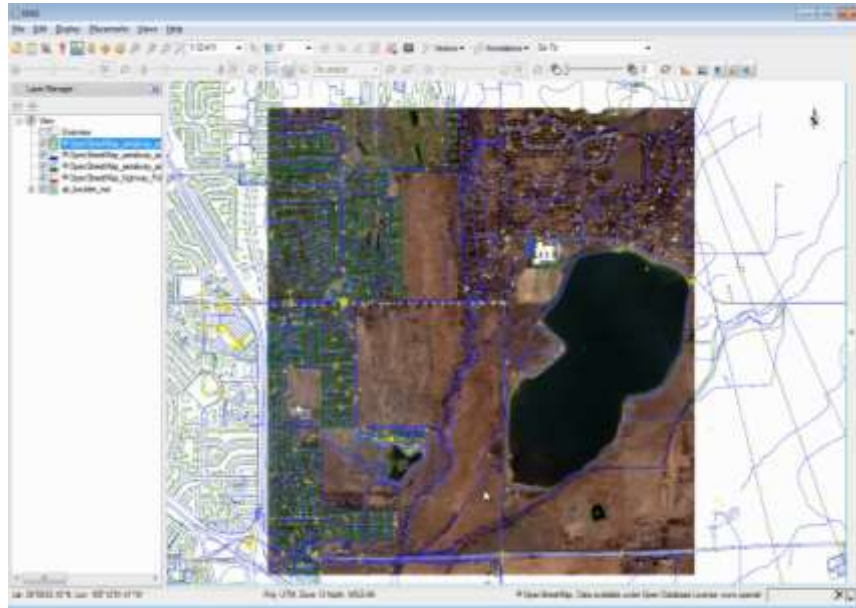
Use vectors for water features and mask out water in a scene.

New Contour Lines in ENVI
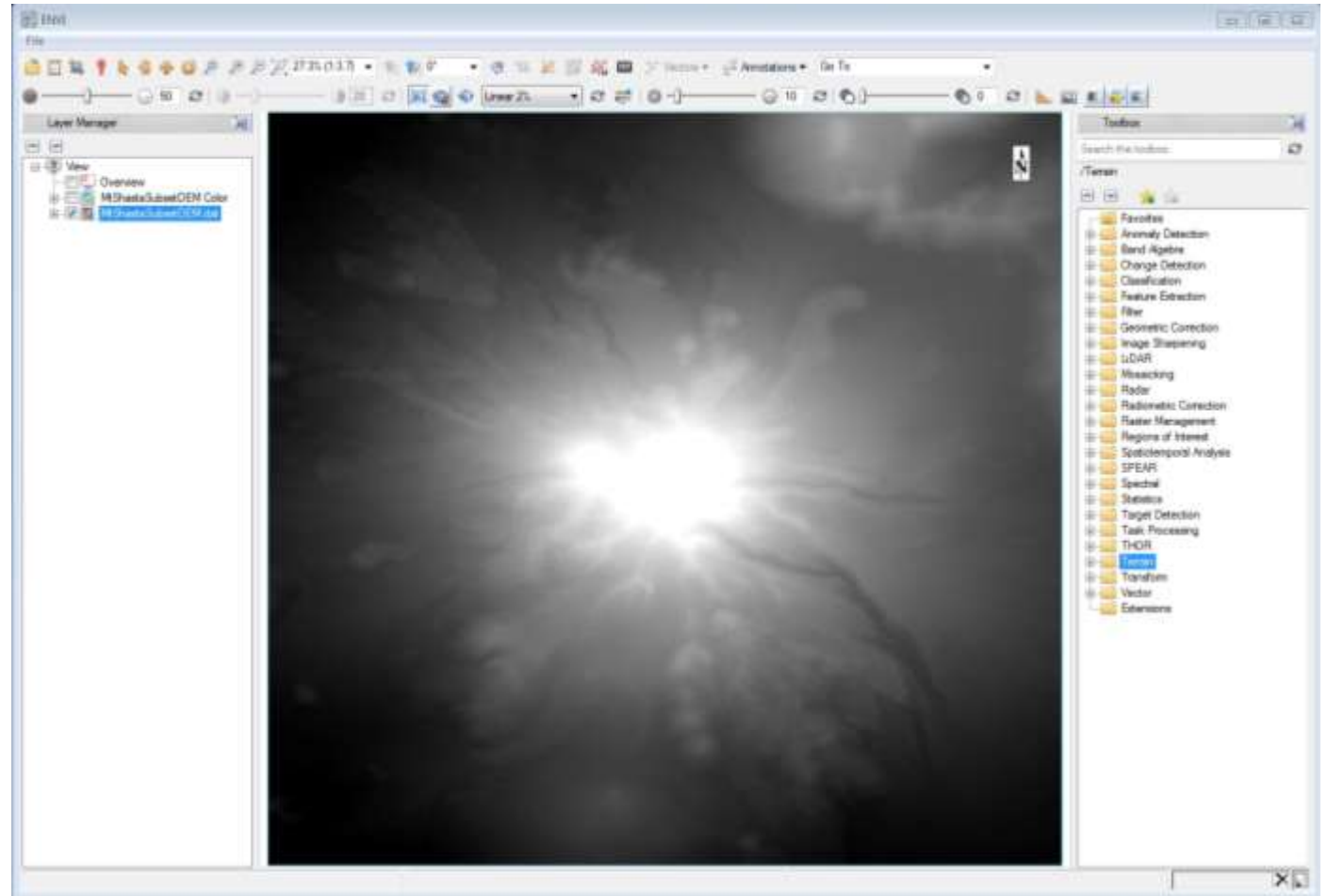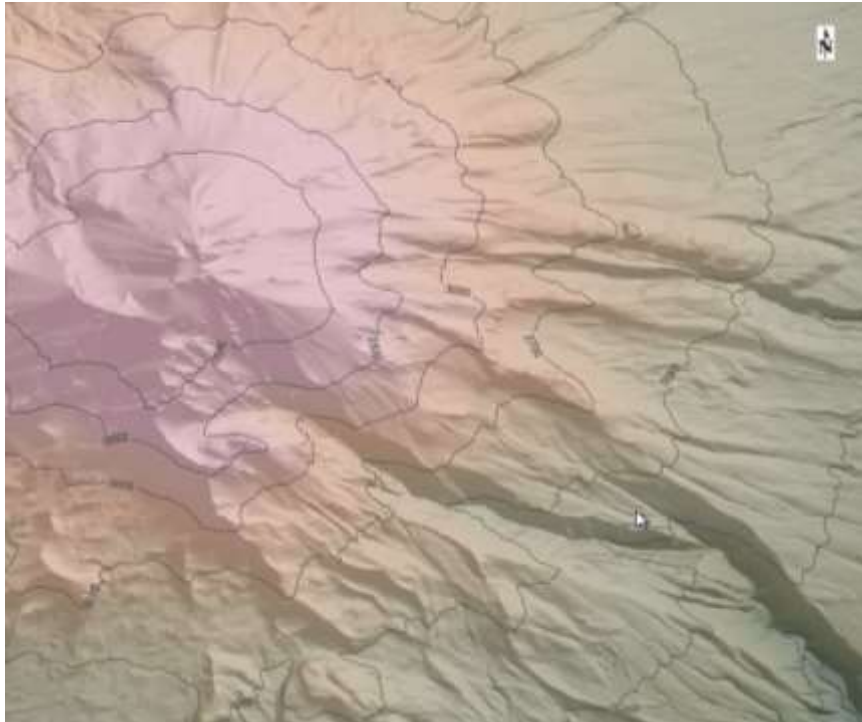
Use the New Contour Layer menu option to display contour lines on a single-band image.

HARRIS®

- SARTask API enables end-to-end analytic workflows that run on desktop, ENVI Modeler, enterprise networks or the cloud
- Sensor Independent Complex Data (SICD) standardization support for SAR data
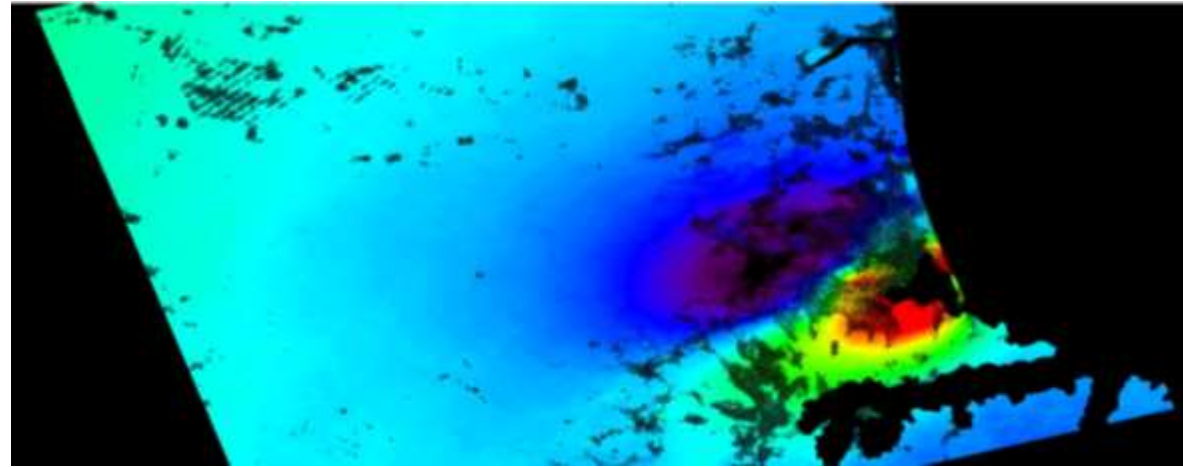
Other new ENVI modules coming soon

- *Opticalscape 5.4.2:* Automated Bundle Adjustment and 1-step DSM & mosaic generation
- *ENVI Crop Science:* 1.1.1 - Curved Rows support
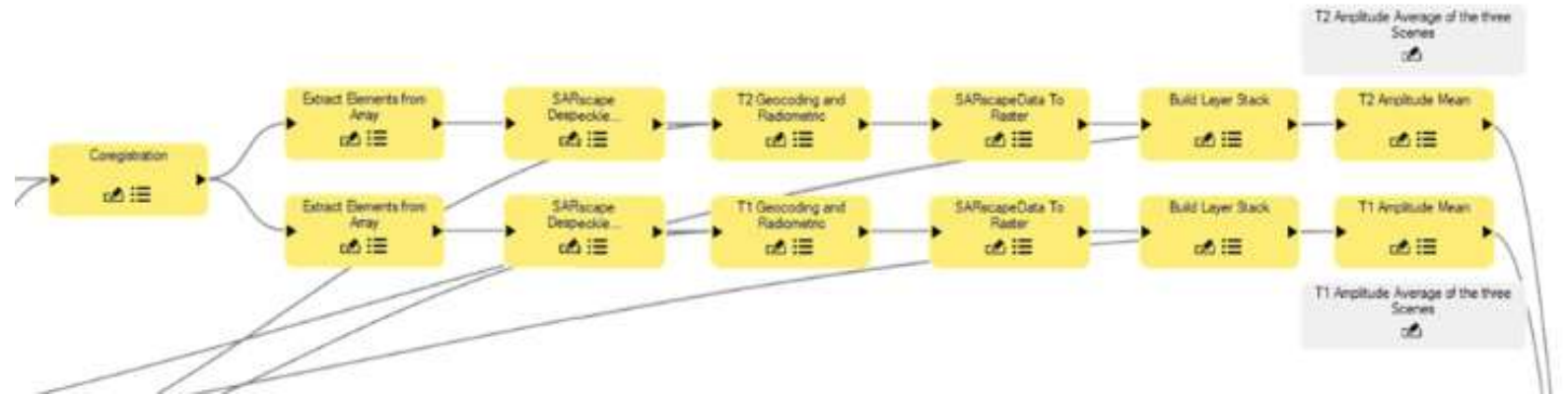
Portion of a SAR workflow in the ENVI modeler for averaging amplitude values in pre/post event data to determine change around airports.

Modern analytic methods in the new Machine Learning framework in IDL

- Softmax
- SVM
- K-means
- Neural Network (Feed Forward FFNN)

Other analytic tools are included

- Autoencoder
- Confusion matrix & Metrics about a classifier applied to test data
- Partition and shuffle
- Normalizers & Optimizers
- Activation functions
- Kernels
- Loss functions

```
; Read data
read_seeds_example_data, data, labels, $
  N_ATTRIBUTES=nAttributes, N_EXAMPLES=nExamples, $
  N_LABELS=nLabels, UNIQUE_LABELS=uniqueLabels

; Shuffle data
IDLmlShuffle, data, labels

; Normalize data
Normalizer = IDLmlVarianceNormalizer(data)
Normalizer.Normalize, data

; Partition data
Part = IDLmlPartition({train:80, test:20}, data, labels)

Classifier = IDLmlSupportVectorMachineClassification(nAttributes, uniqueLabels)

Loss = Classifier.Train(part.train['data'], LABELS=part.train['labels'])
confMatrix = IDLmlTestClassifier(Classifier, part.test['data'], $
  part.test['labels'], ACCURACY=accuracy)
Print, 'Model accuracy:', accuracy

; Classify the first example
Print, Classifier.Classify(data[*,0])
```

Example code that trains a Support Vector Machine (SVM) classifier in IDL

IDL Package Manager (IPM) makes it easier for developers to share IDL code in open ecosystems

- Publish to github
- Create, install, update, and remove IDL packages, which are zipped files & folders
- Packages can contain IDL pro code, IDL save files, and/or IDL DLMs
- New IDL_PACKAGE_PATH preference, and the IDL path is automatically updated

Previous releases provided the building blocks that enable integration

- IDL Python bridge was the initial Python integration that paved the way
- ENVI Py is used in the Esri ArcGIS integration
- GSF Py enables Python code with GSF

IPM-ready libraries are now available

- ipm, /install, 'https://github.com/csalvaggio/IDL_RIT_Salvaggio'
- ipm, /install, 'https://github.com/hadfieldnz/idl-motley'
- ipm, /install, 'https://github.com/hadfieldnz/idl-roms'
- ipm, /install, 'https://github.com/mankoff/kdm-idl'
- ipm, /install, 'http://packages.idldev.com/idldoc.zip'
- ipm, /install, 'http://packages.idldev.com/mgunit.zip'

ArcGIS Integration Updates

Harris and Esri are close partners to bring trusted ENVI analytics into ArcGIS

The ENVITasks API enables ENVI analytics to run in ArcGIS Pro

ENVI Modeler makes it very easy to create and publish custom ENVI workflows to ArcGIS

ENVIPy leverages the ArcGIS Python support for this integration
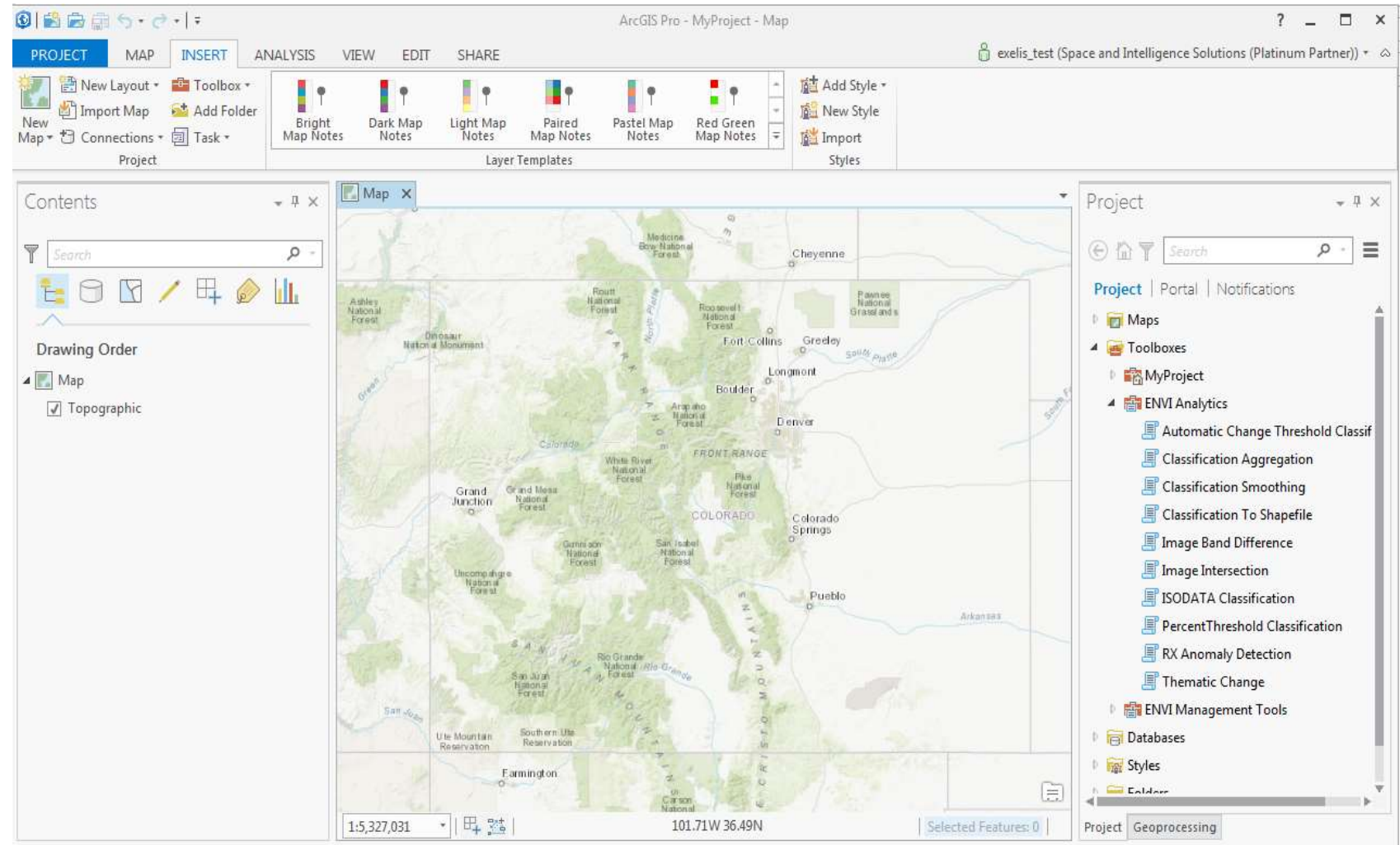
Support for ArcGIS 10.6

HARRIS

Connect parameters directly to View and Data Manager nodes

Filter by Tag button
- Search for tasks by category

Find Similar Tasks
- When publishing a task, enter a list of tags to categorize the task by function

Input Parameters node
- Provides additional options for display name, description, and order of individual parameters
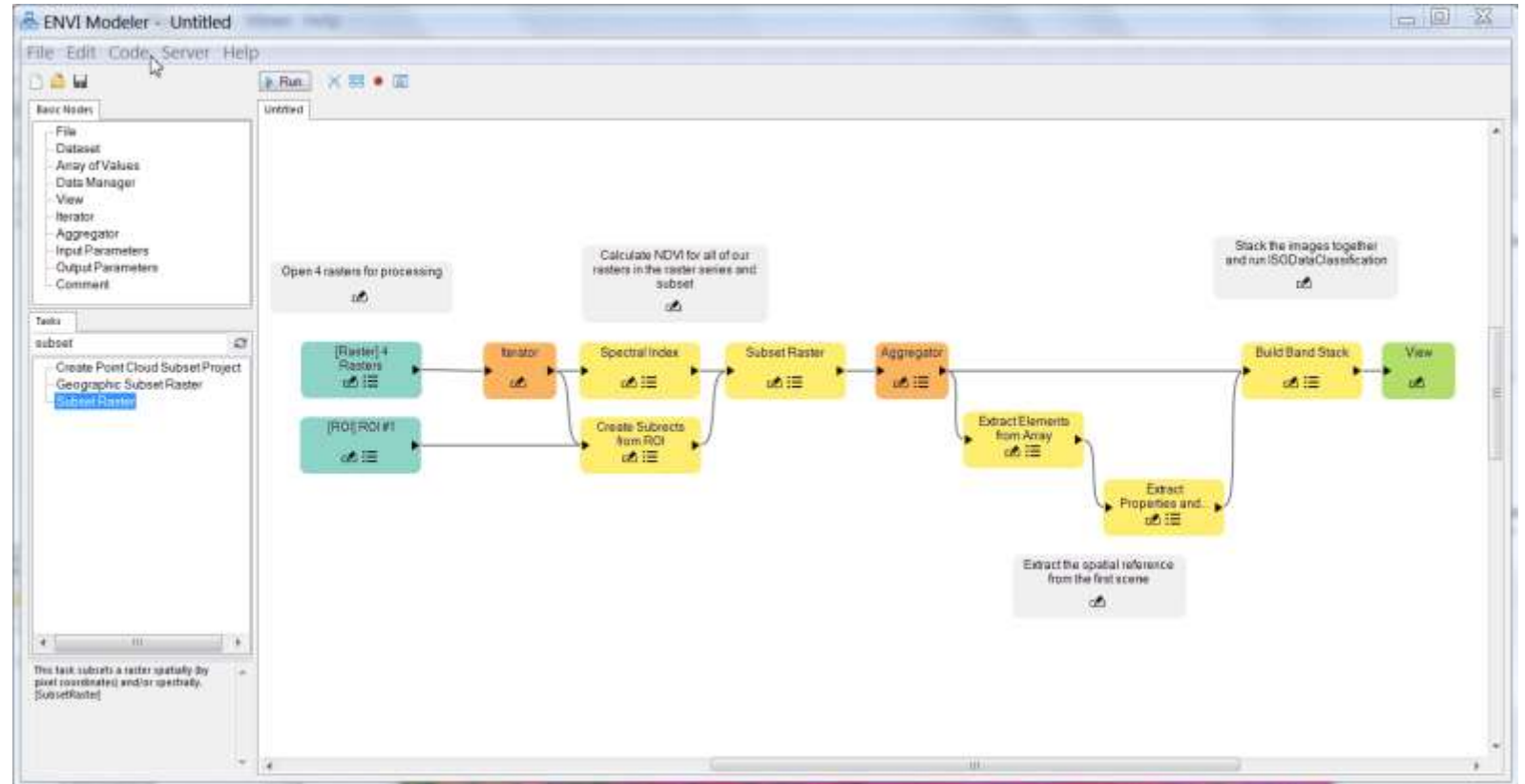
ENVI Modeler provides visual workflow modeling and programming that makes your analysis even more flexible and efficient. It bridges your desktop processing with enterprise/cloud deployment.

New ENVI Tutorials

Getting Started with ENVI

Running ENVI Analytics in ArcGIS Pro

Sentinel-3 Marine Data

Image Change Tutorial was updated to use Sentinel-2 imagery of a flood in Peru in 2017
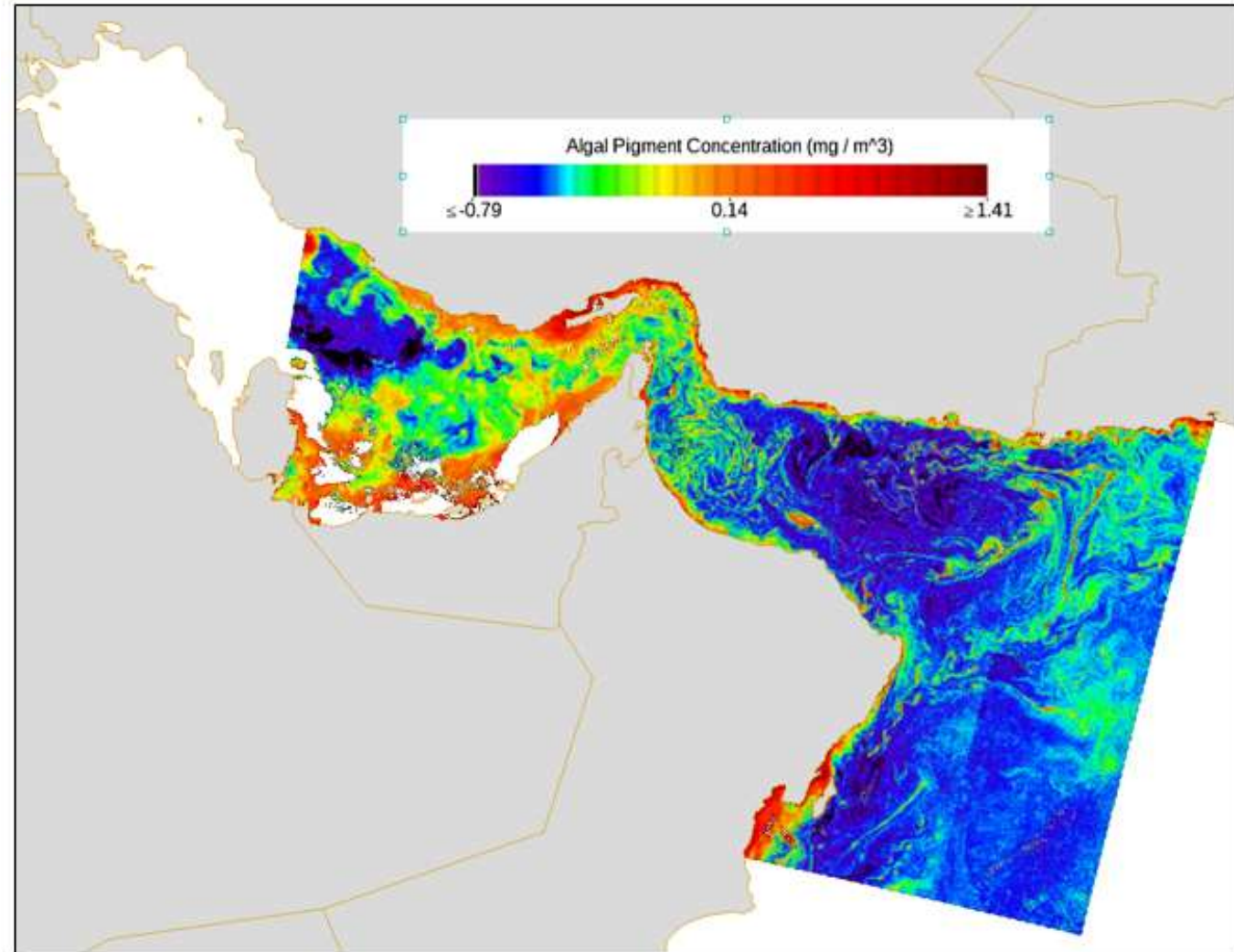
Image from Sentinel-3 Marine Data tutorial

Kákonyi Gábor, GeoIQ Imaging kft. www.geoiq.hu Tel: +36309310626

Inpho és UASMaster újdonságok 2019-ben

The Idea

is a photogrammetry software designed to transform

Image Raw Data to Spatial Information

i.e. Point Clouds, Surface Models, Orthophoto Mosaics, Georeferenced Images

Inpho Roadmap 2018

UASMaster 9.0 ✓
- Georeferencing for close range & UAV/Mobile/Helicopter flights/data
- High-end point cloud support (dense matching)
- Simplified/automated project setup
- **Release date: 23th March**

UASMaster 9.0.1 & 9.0.2 ✓
- Bug fixes (Dense Matching improvements)
- **Release date: 18th June & 26th July**

Inpho Suite 8.0.8 ✓
- Bug fixes
- **Release date: 8th August**

Inpho Suite 9
- State-of-the art Dense Matching and TrueOrtho generation for Aerial Frames imagery, optionally Mesh output
- Editing of dense matching data w.r.t. to partial updates of TrueOrtho product (round trip workflow)
- **Release date: Q4 (Intergeo Announcement)**

UASMaster 9.1
- Mesh generation
- iXM-100 camera support (102,06 Mpix [11664x8750])
- **Release date: Q4 (Intergeo Announcement)**

Q1 2018	Q2 2018	Q3 2018	Q4 2018

INTERGEO
(16-18 Oct 2018)

DIMENSIONS
(05-07 Nov 2018)

Trimble.

Inpho Version 9 Highlights

- **Inpho Suite version 9** combines classical photogrammetric capabilities with modern 3D workflows

- Release Date: Q4 2018 (Intergeo Announcement)

- Includes new module **MATCH-3DX** and **MATCH-3DX Meshing Add-on**:
  - **Semi Global Matching** (SGM) techniques enable photogrammetrists to reach a new level in quality and precision for the generation of large scale dense point clouds
  - **True Orthophoto** capability ensures that each image pixel is directly related to the surface height, simplifying mapping and the overlay of GIS data, especially for urban mapping applications
  - **Meshes** enable non-professionals to easily navigate and understand the real world environment

Semi Global Matching — True Orthophoto — Photorealistic Textured Meshes — MATCH-3DX

Trimble.
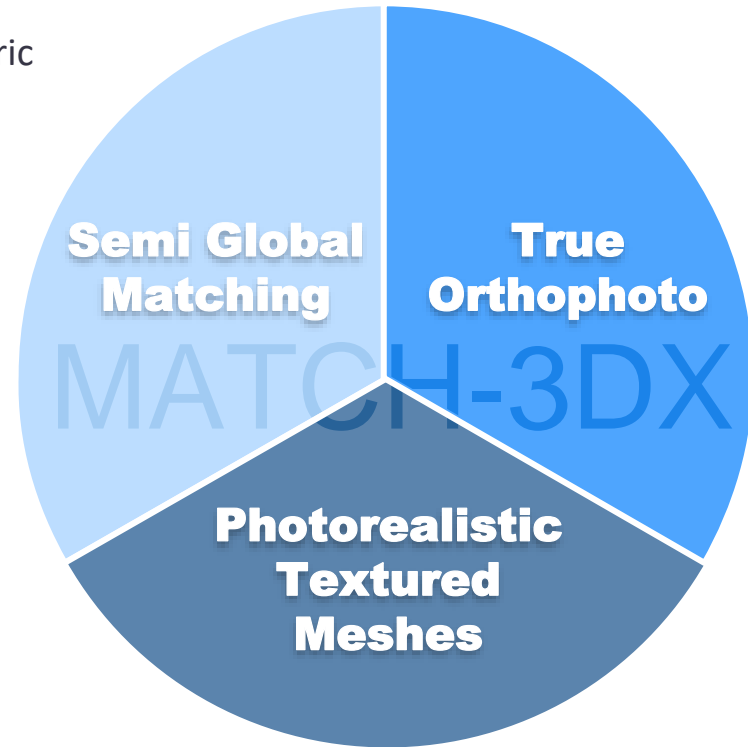
Inpho Version 9 Highlights

- Inpho Suite version 9 combines all Orthophoto generation workflows in a single software environment:

  - **True Orthophoto** generation based on aerial (frame) imagery (via MATCH-3DX)

  - **Classical Orthophoto** generation based on aerial and satellite imagery (via MATCH-3DX or MATCH-T)

- With the new MATCH-3DX Meshing Add-on, photogrammetrists can generate highly accurate, **photorealistic textured Meshes** that enable non-professionals to easily navigate and understand the real world environment

- The 3D textured meshes provide an efficient data type for use within industry leading GIS systems and web-based 3D visualization services -- often used for 3D city modeling, construction simulation and gaming applications

  UASMaster 9.1 allows the generation of textured meshes

Textured Mesh

Trimble

General Enhancements in Inpho version 9

- Module: ApplicationsMaster
  - Update and support of new Coordinate Systems

- Module: MATCH-AT
  - Adjustment: Extension of GNSS observation from 25000 to 50000
  - Large blocks can now be processed with camera calibration

- Module: OrthoVista/OrthoMaster
  - JPEG & TIFF image loading improvements
  - Display of DTM grids in feet is now correct

- Module: DTMaster
  - new tool option "best-fit stereo": Mainly implemented for high overlapping images
  - Extended open Stereo View Options – Image pair selection for better height adaption
  - improved LAS file and layer statistics

- … and more