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Scalability for Large Photogrammetry Projects

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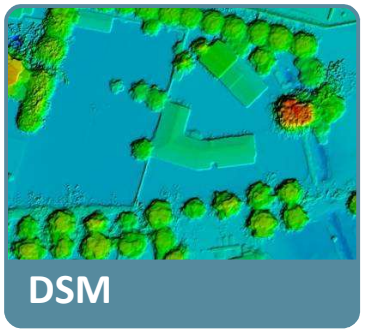
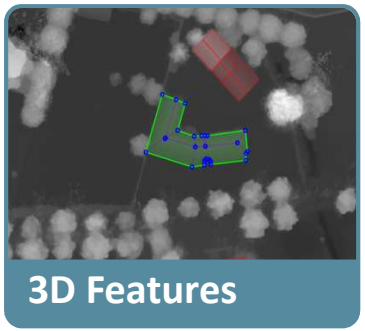
About SimActive

- Founded in 2003, SimActive is the developer of Correlator3D™ software, a patented end-to-end photogrammetry solution
- SimActive has been selling Correlator3D™ to leading mapping firms and government organizations around the world
- Correlator3D™ is a fast, accurate and robust, best-in-class production software





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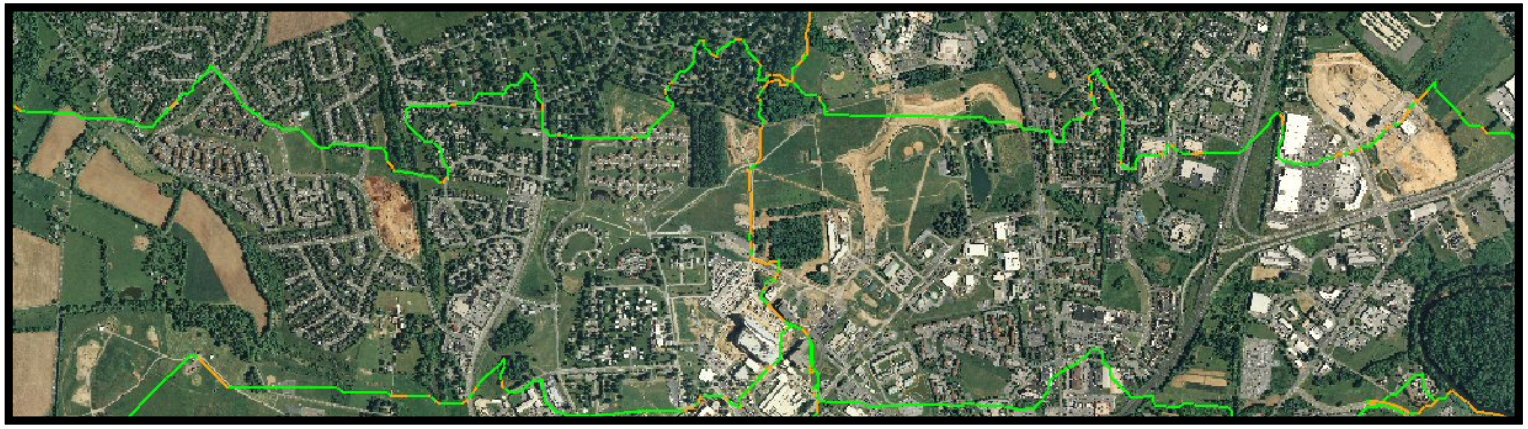
Challenges

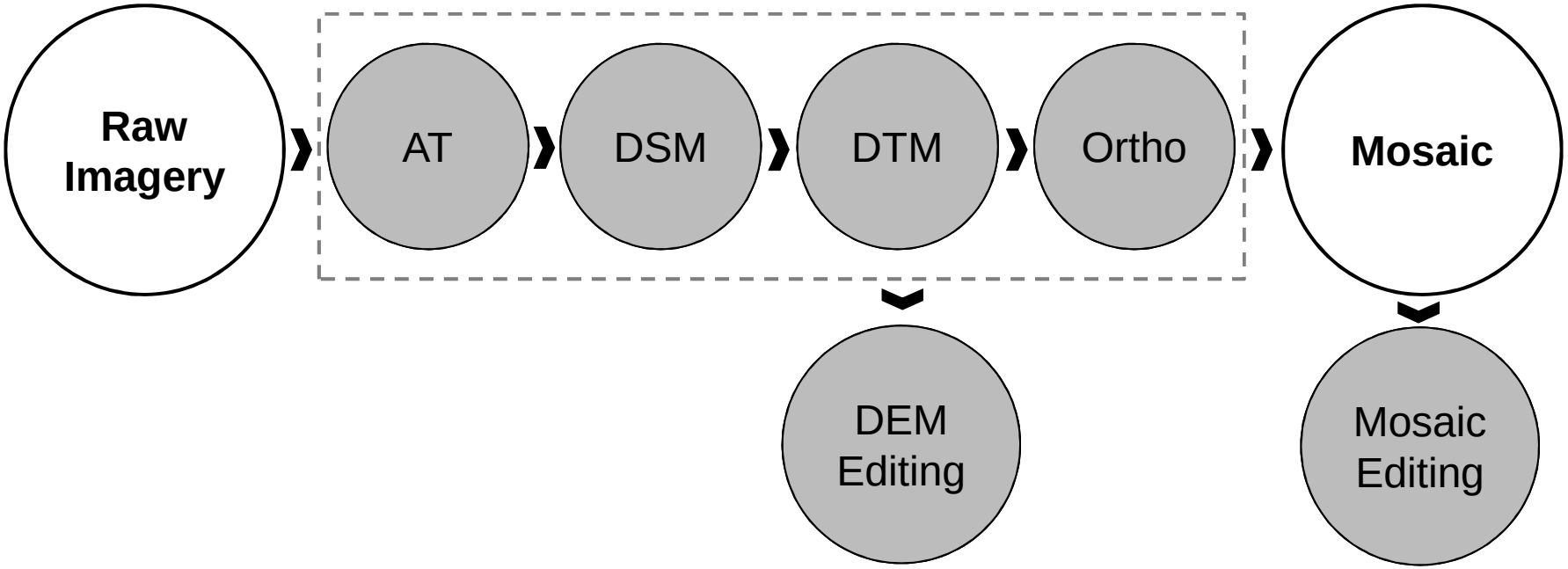
- Rapid development of infrastructure needs up-to-date mapping
- Thousands of large format aerial images required for typical urban areas
- Relatively easy to acquire, but difficult to process quickly to build elevation models and orthomosaics



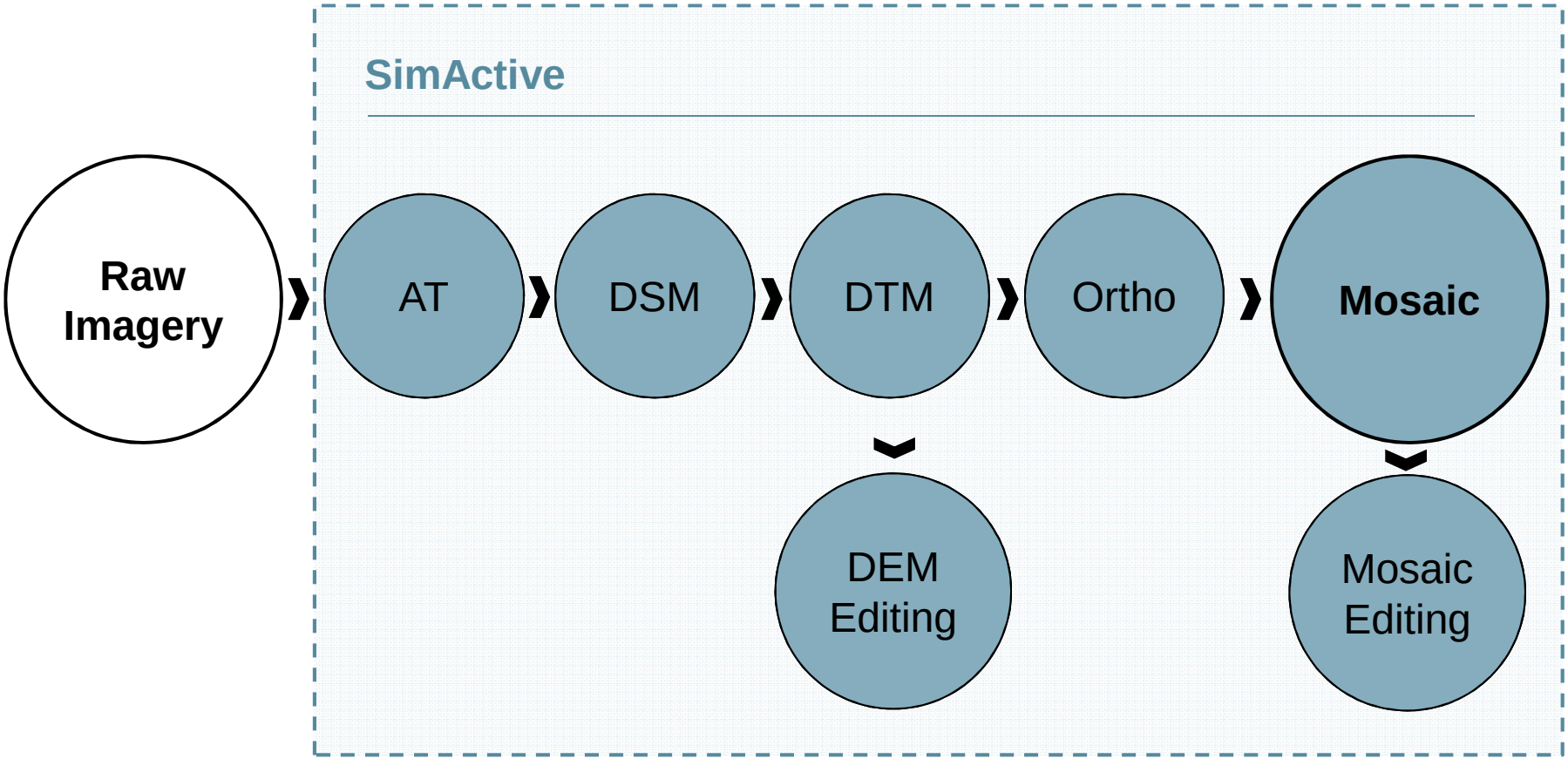
Typical Project

Number of Images	5,000
Total Area Covered	5,000 km^2
Image GSD	10 cm
Frame Size	200 MP
Image Size	800 MB
Raw Data	4 TB
DSM	150 GB
Orthomosaic	1.5 TB

Automated Workflow



Correlator3D™ Software



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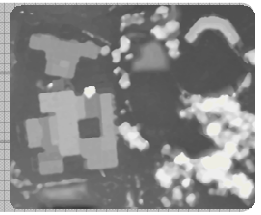
Correlator3D™ Modules

IMAGERY	
Aerial	**Satellite**
Microsoft Ultracam	GeoEye
Intergraph Z/I DMC	Worldview
UAV	ALOS Prism
RCD30	IKONOS
ADS80	SPOT
VM A3	Cartosat
Scanned Films	RADARSAT - 2

PROCESSING MODULES

- **Aerial Triangulation**
- **DSM Generation**
- **DTM Extraction**
- **DEM Editing**



- **Orthorectification**
- **Mosaic Creation**
- **Mosaic Editing**

- **Feature Extraction**

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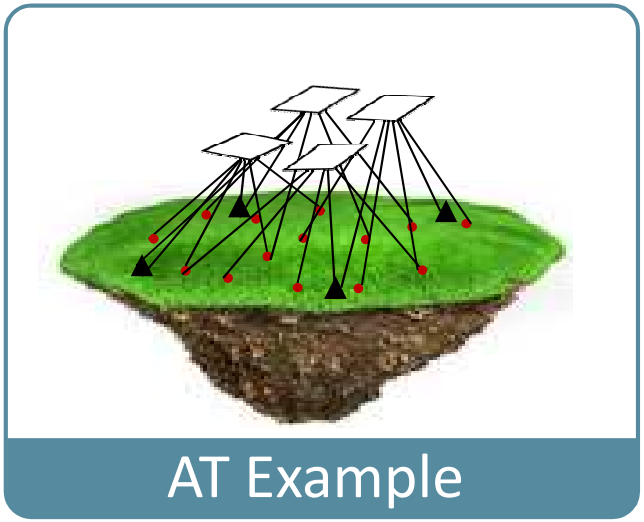
Correlator3D™ Workflow

Step 1: Aerial Triangulation

Workflow

- Inputs: GPS, camera, images
- Outputs: Adjusted EO, calibrated camera



AT Example

Correlator3D™ Benefits

- Robust and precise adjusted EO from stereo imagery
- Rapid processing using GPU and multi-core CPUs
- Advanced algorithms with unique minimization techniques support large blocks
- Intuitive and easy to use

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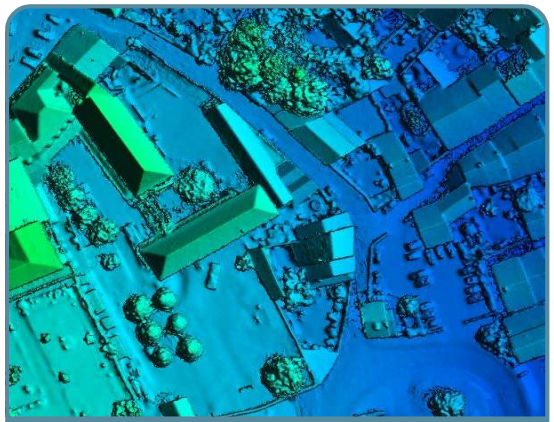
Correlator3D™ Workflow

Step 2: DSM Generation

Workflow

- Inputs: EO, camera, images
- Output: Dense DSM



DSM Example

Correlator3D™ Benefits

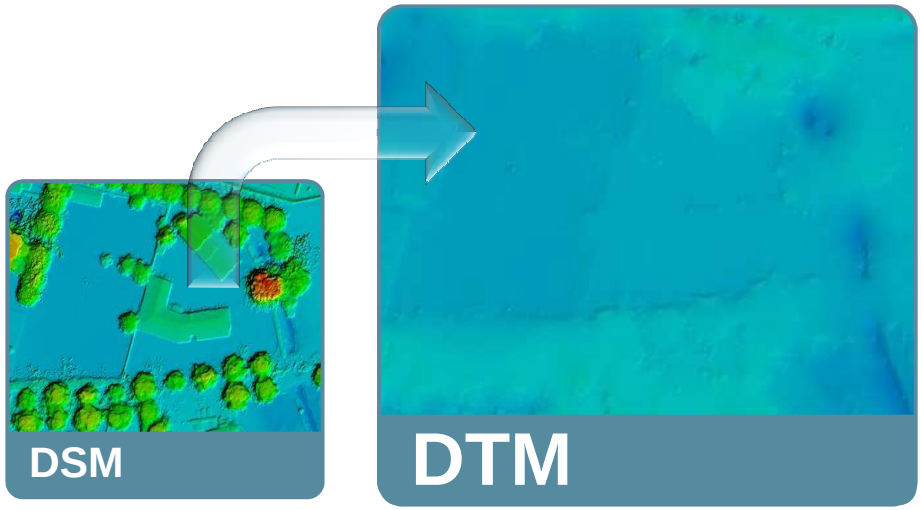
- High resolution dense DSM generated from stereo imagery
- Fast processing using GPU
- Patented algorithms with advantages of multi-ray approach without heavy processing requirements

Correlator3D™ Workflow

Step 3: DTM Extraction

Workflow

- Inputs: DSM
- Output: DTM



Correlator3D™ Benefits

- Automatic filtering of DSM to extract DTM
- Unique algorithms for identifying ground

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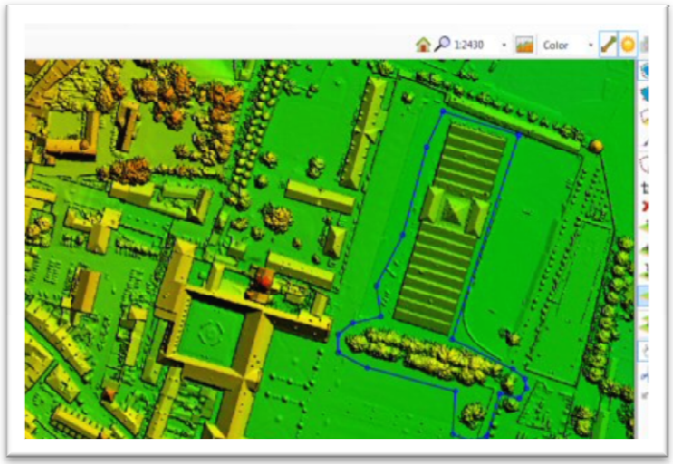
Correlator3D™ Workflow

Optional: DEM Editing

Workflow

- User interacts with DEM



Correlator3D™ Benefits

- Features powerful monoscopic editing functions
- Highly intuitive user interface

Correlator3D™ Workflow

Step 4: Orthorectification

Workflow

- Inputs: DTM, EO, camera, images
- Output: Orthos

Correlator3D™ Benefits

- Fast production of individual orthos
- Generation of true orthos

Correlator3D™ Workflow

Step 5: Mosaic Creation

Workflow

- Inputs: Individual orthos
- Output: Orthomosaic

Correlator3D™ Benefits

- Fully automated merging of unlimited number of orthos
- Smooth and seamless mosaics
- Advanced algorithms for color adjustments and automatic seamlines

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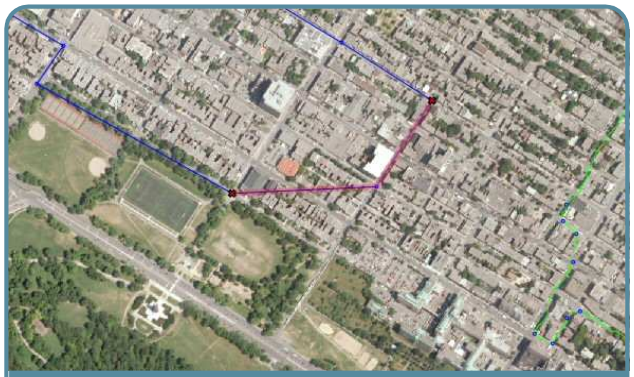
Correlator3D™ Workflow

Optional: Mosaic Editing

Workflow

- User performs seamline or color changes



Modifying Seamlines

Correlator3D™ Benefits

- Simultaneous multi-user seamline modifications
- Highly intuitive visual interface
- Real-time updating of final mosaic
- Smooth interaction with data

Processing Time

Images	GSD	Frame Size	Standard PCs
5,000	**10 cm**	**200 MP**	**5**

Project at a glance

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Quality Statistics

Results	
GSD	10 cm
Ground Control Points	158
AT RMS Pixel Error	0.36 pixels
DSM ΔZ RMSE	12.2 cm
Orthomosaic ΔX RMSE	11 cm
Orthomosaic ΔY RMSE	10.5 cm

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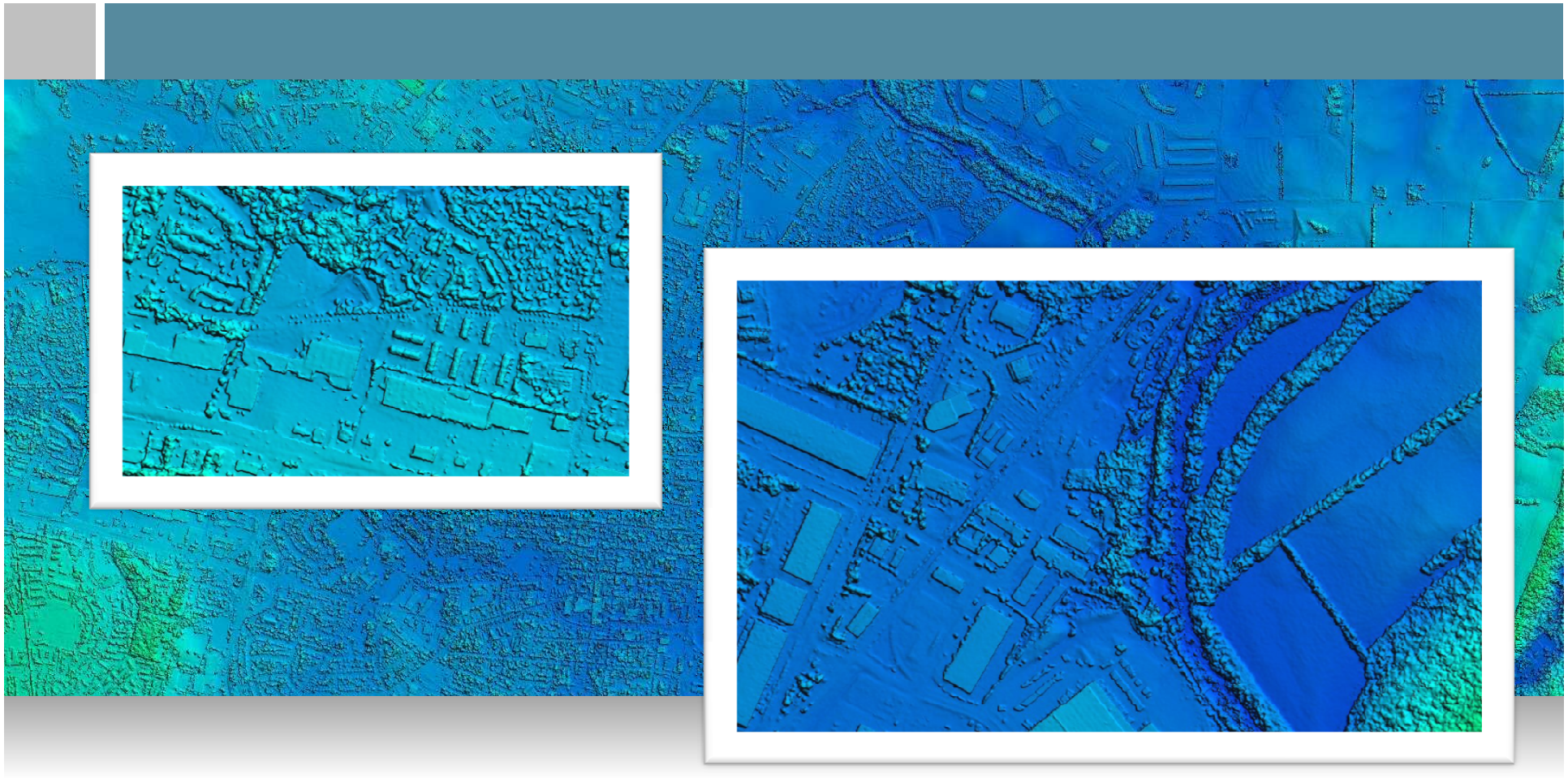
DSM Sample



Highly dense DSMs through unique autocorrelation and filtering techniques

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Orthomosaic Sample

Seamless and color-balanced mosaics generated using highly intelligent algorithms

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Conclusion

- Massive DEMs and orthomosaics can be generated within days only
- Correlator3D™ advantages
  - Highly precise results based on advanced algorithms
  - Unsurpassed speed through GPUs and multi-core CPUs
  - Easy to use, highly automated processes
  - Only standard PCs required for maximum performance

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