# sim<sup>2</sup>ctive

**Dense DSM Generation Using the GPU** 

**Dr. Philippe Simard** President SimActive Inc.

# **About SimActive**

- Leading developer of photogrammetry software for over 10 years
- ► Continually innovating with the Correlator3D<sup>™</sup> product
  - ▶ First GPU powered AT and DSM engines in the industry







sim<sup>2</sup>ctive













 Actively built upon GPU expertise, optimizing code for subsequent DSM releases









#### 2. Sensitivity

- Radiometry differences between images
- Camera calibration
- Exterior orientation

#### 3. Density

More points leads to longer processing time

sim<sup>2</sup>ctive

# **SimActive Top-Down Approach**

Idea: test solutions and check whether they solve the correlation problem

# sim<sup>2</sup>ctive





# Parallelization

#### Parallelization with standard PCs is simple, intuitive and scalable

	Cluster Solution	Standard PC	simactive
Upgrades	Costly, difficult	Easy, affordable	
Maintenance	IT support required	Low maintenance	
Hardware	Specialized	Standard	
Cost	Expensive	Manageable	

ve

#### **Results**

#### Large-Format Sensor

Image GSD	0.10 m
Image Size	200 MP
DSM Resolution	0.30 m
DSM Accuracy	0.10 m
Processing time	7.9 min/frame
RMSE	0.11 m
Bias	0.04 m



# Results

#### Satellite Sensor

Image GSD	0.50 m
<b>DSM</b> Resolution	1.50 m
DSM Accuracy	0.28 m
Processing time	15 min/frame
RMSE	0.73 m
Bias	0.57 m



ve

## Results

#### **UAV Sensor**

Image GSD	0.05 m
Image Size	20 MP
DSM Resolution	0.15 m
DSM Accuracy	0.06 m
Processing time	10 sec/frame
RMSE	0.08 m
Bias	0.03 m





# <section-header><list-item><list-item><list-item><list-item><list-item><list-item>