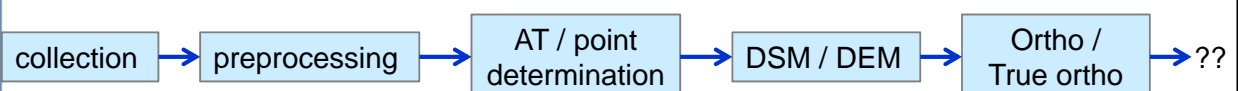


*Dieter Fritsch's Wrap-Up (Summary)*

1<sup>st</sup> Topic: "Digital Mapping Camera Evolution"

- State-of-the-Art & New Developments
  - Digital sensors are more & more embedded in workflows
  - High-end DCs: ADS80 / DMCII 140/230/250 / UltraCam Eagle
  - Is there a pixel race – the more the better? (> 20000 across-track)
  - Medium format DCs: IGI DigiCAM (Quatro, PentaCAM) / RCD30 / Trimble's 80Mpixel
  - Further camera systems: IGI IR camera
- Geometry / Radiometry
  - Photogrammetry still geometry-biased / geometry-centered
  - still classical processing pipelines / pipelines improved





## The Photogrammetric Week Series 53<sup>rd</sup> Photogrammetric Week, Sept. 5-9, 2011



- Radiometry just used for texturing, nothing more
- Potential of radiometry for feature extraction shall be investigated in future, don't wait another 10 years
- Online GNSS data processing
  - "Golden Age" of online positioning, 120+ satellites in 5-10 years to come
  - Online services like OMNISTAR / IALA / FAFS / StarFire provide near real-time positioning (down to cm range)
- UAVs are complementary to classical aerial photogrammetry
  - Ready for mapping missions
  - Small-size projects (stamp-wise photogrammetry)
  - Still missing: legal regulations for heavier payloads



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- Power-line Mapping / RADAR
  - Existing missions of TerraSAR-X / Tandem-X delivering global DEMs with 12m spacing P 2/1m z-accuracy
  - Basic data set of the future for DEM fusion
  - Open DEM Initiative (like Open Street Map?)



## The Photogrammetric Week Series 53<sup>rd</sup> Photogrammetric Week, Sept. 5-9, 2011

### 2<sup>nd</sup> Topic: "Point Cloud Generation and Processing"

- Dense Image Matching/Semi Global Matching is changing the game in photogrammetry (H. Hirschmüller)
- Accuracy depending on base-to-height ratio & number of image ray intersections (N. Haala)
- Industry has already adopted Dense Image Matching in SW packages, e.g. Xpro, Match-T (new generation), computing time no issue anyway as # of cores is increasing
- Problem (of photogrammetry): Cannot penetrate vegetation
- LiDAR has made huge progress (A. Carswell/J. Hyypä), radiometric calibration of intensities, may be combined with MS camera systems & Hyperspectral camera systems → quality info extraction of point cloud attributes



## The Photogrammetric Week Series 53<sup>rd</sup> Photogrammetric Week, Sept. 5-9, 2011

### 2<sup>nd</sup> Topic: "Point Cloud Generation and Processing" cont.

- Full waveform echos are used in every day applications, deliver the best point clouds (A. Ulrich)
- You can't recover information that has been lost!
- Merging point clouds is not yet solved (L. Graham)
- Maintain independent points, don't use TINs. Consider basics of signal processing
- Dual-output LiDAR doubles pulse & scan rate (ALS70+) Point Density Multiplier (R. Roth) – 2 complete scan heads in 1 single scanner
- Panel discussion (has been recorded in MP3) → minutes?





## The Photogrammetric Week Series

### 53<sup>rd</sup> Photogrammetric Week, Sept. 5-9, 2011

#### 3<sup>rd</sup> Topic: "Towards 3D Augmented Worlds"

- 3D Models using crowd-sourced photos (→ Volunteered 3D Modeling) are impressive (Rome in 24h, the world in 6 days) → Spotwise 3D modeling → CV has reinvented photogrammetry again
- Radiometric/dynamic Scene Modeling still a challenge (J.-M. Frahm)
- 3D Multimedia Content by terrestrial LiDAR, structured light scenes, photos → Glasgow School of Art / Historic Scotland
- Amazing 3D objects: Dublin Castle / Schönbrunn Palace / St. Kilda / Rosslyn Chapel / Mount Rushmore (L. Wilson)
- Cycloramas as add-ons to classical photogrammetry: 2D/3D Cycloramas are simple to measure & navigate, stereo visualization, overlay of 2D/3D plans → combination of mobile LiDAR & panoramic imagery



## The Photogrammetric Week Series

### 53<sup>rd</sup> Photogrammetric Week, Sept. 5-9, 2011

#### 3<sup>rd</sup> Topic (cont'd)

- Computer Vision techniques processing UAV imagery automatically, huge potential (Ch. Strecha) → Future of UAVs?
- Is necessary in critical situations (stadiums, monitoring, etc.)
- DSM as enabler of Very Advanced 3D Landscape Models, Very impressive 3D visualizations & animations of mountains, regions → 3D modeling meets public sensing
- Combination of photogrammetry & CV methods for the benefit of digital preservation → low-cost sensor system can deliver high density point cloud / highly accurate point cloud

