

## Breakout Session 1 (6 groups)

### 1. Is the benchmark important for all 3 groups, NMCAs, academia and industry?

YES

- to know methods/tools to achieve the expected results
- for industry => 'state-of-the-art'

...

Commercial Software late, no competition, hesitates

Academia: Assess algorithms, test data

NMCA: local test areas + final conclusion

...

Industry:

- helpful for commercial software choice
- no benchmark so far

NMCA

- efficiency of the processing

...

AC. Yes, need for reference data sets

IN. Yes, but goal specified => standards

MA. Yes, but larger scale => production speed

...

Yes,

- decision support for implementation
- comparison of methodology
- own resources are limited
- in-depth information about algorithm and data

...

What is meant by 'benchmark'

- NMCAs – good-benefits most
- Academia – good
- Industry – good
- For all 3: good collaboration, inter-relationship, working-groups

## 2. Which role SGM/dense image matching will play in near future?

- Replace LIDAR
- 3D textured datasets
- ...
- Dominant, 3D City, Driver Assistance, Canopy Models, Close range, 3D Change
- ...
- Updating of surface model
- Orthophoto production
- All in 1 Photogrammetrie
- ...
- Future: large scale DSM production
  - and true ortho
  - and change detection (all at low costs)
- ...
- It will play an important role!
  - new quality layer for different analysis
  - automated Orthophoto production
- ...
- role in enabling new products to sell (NMCAs)
- more provision of ground truth and conformity
- improve current issues (shadows?)
- stereo/multi-view (redundancy) approach
- Assemble & consolidate benefits and drawbacks to vendors and users

### 3. Have the datasets for the current benchmark be well chosen?

YES, but missing

- Low GSD + high overlap
- High GSD + high overlap
  - ⇒ vary height parameters

...

No forest, mountains, rural, more overlap in flight  
⇒ new data, low res but high overlap

...

- glaciers areas
- bigger areas
- focus on rural (not city-based) areas

...

2 sets (goals) needed < precision  
< speed

+ infrared?

+ wood areas

+ mountains

state-of-the-art imagery?

...

This should be improved:

- different landscape types
- data type (influence of bit depth, image compression)
- camera systems

...

- Data quite challenging
- Not enough open terrain
- No ground truth (Terrestrial LS), ROOFS?

#### 4. Are the current results meeting the expectations?

- no qualitative results
- no results of commercial solutions
- ...
- No quality figures + standard, criteria catalogue
- Cost? Results meet expectations
- ...no qualitative comparison between different software results
- unknown goal
- no assessment, small datasets are not representative
- ...
- quality: yes, but 1) noise 2) shade area 3) high overlap needed
- speed: no for large scale
- .....
- Quantitative assessment is needed
- .....
- Validation? Consistency of results. Best practice. Re-define the benchmark.

## 5. Which measures are adequate to assess the 3D reconstruction by dense image matching?

- dense GCP
  - GCP in 'difficult' locations
  - ALS/TLS reference data
  - ...
  - Runtime, geometric accuracy, good for true ortho
  - City modelling LOD2, spot ground truth
  - ...
  - trees/forest – field measurement good but not possible therefore =>
  - stereo manual measurement
  - relative accuracy between different software results
  - LIDAR data of superior quality
  - cities - terrestrial measurement
  - ...
  - quality of processing (AT!)
  - quality of ortho (true .. )
  - ...
  - Depends on the application
  - ...
  - Needs more comparisons with other data (building footprints for example):
    - terrain models
    - derived data (roofs)
    - filtered laser scanning
  - Can the same tools be used (filtered laser scanning)
- More assessment of rural areas + forestry. PLUS complex geometries.

## 6. Any idea for improving the current benchmark?

- Recommendations for user:
  - fair comparison on quality
  - fair comparison on run-time
- ...
- Independent assessment, Provide results publicly, multi-temporal datasets, max. 4 datasets
- ...
- start management structures
- thorough planning
- additional datasets
- communication of industry & software vendors
- use the approach of ISPRS benchmarking
- definition of use cases (alike to INSPIRE)
- ...
- dialogue to be improved (IN,AC,MA)
- time line clarified
- investment/marketing
- standards
- larger sets
- ...
- Standardized parameters for comparison
- stereo-vision middle bury homepage
- ...
- State very clearly the definitions
- Ranking of requirements
- Absolute vs. Relative benchmark