

TU Delft welcomes on behalf of the co-organizers the participants in the seminar

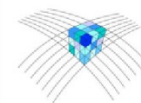
Management of massive point cloud data: wet and dry (2).



December 8th, 2015

10.00-17.00 hours

Berlage zalen



OGh
Ordnings
Gebruik
Hulp

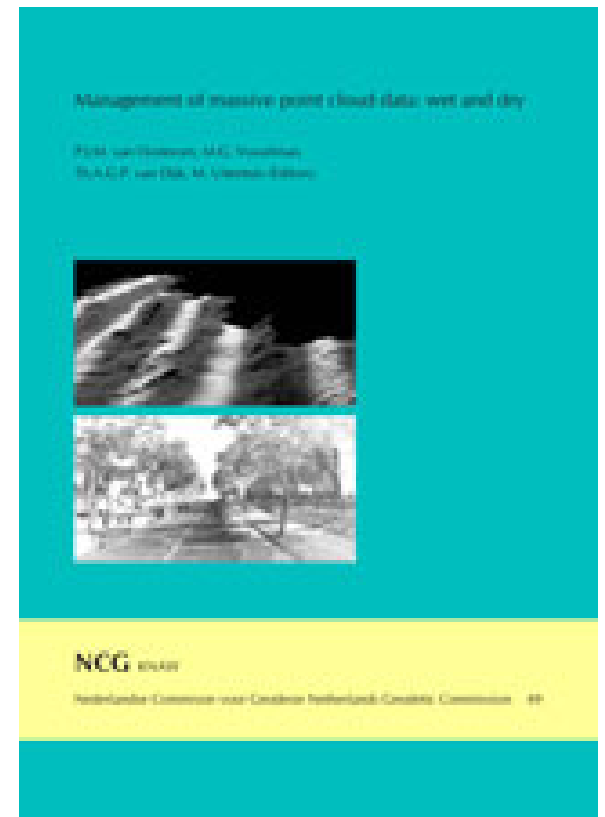
TU Delft

netherlands
eScience center


TU Delft

Management of massive point cloud data: wet and dry (2)

- Location: Oracle Nederland BV, Rijnzathe 6, 3454 PV De Meern
- First edition: 26 November 2009
- More than 6 years ago...
- Collaboration NCG and OGH
- Resulted in publication:
<http://www.ncgeo.nl/phocadownload/49NCGGroenPointClouds.pdf>
- Same organizers: thanks for the support
- Some of the same speakers (new results), and several new speakers
- Enjoy, share, and learn!



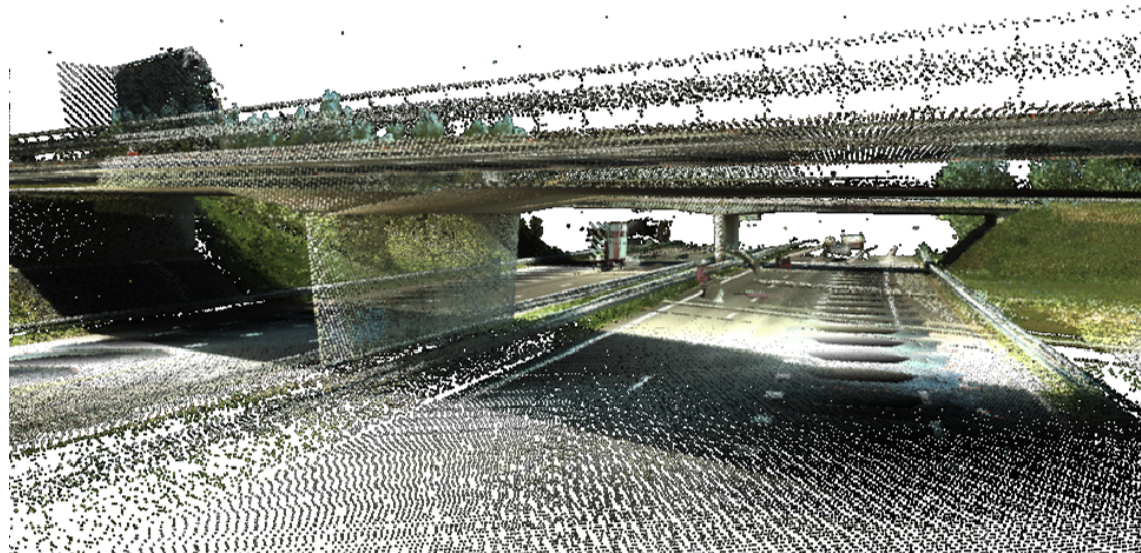
NL eScience Point cloud project final activity

- TU Delft:
 1. GIS technology
 2. TU Delft, Library, contact with research & education users, dissemination & disclosure of point cloud data
 3. 3TU.Datacentrum, Long-term provision of ICT-infra
 4. TU Delft Shared Service Center ICT, storage facilities
- NL eScience Center, designing and building ICT infrastructure
- Oracle spatial, New England Development Centre (USA), improving existing software
- Rijkswaterstaat, data owner (and in-house applications)
- Fugro, point cloud data producer
- CWI, Amsterdam, MonetDB group

→ <http://pointclouds.nl/>

Acknowledgements

- The massive point cloud research is supported by Netherlands eScience Center, the Netherlands Organisation for Scientific Research (NWO) (project code: 027.012.101)



Programme, before lunch

10:00 SESSION 1

1. **Rogier Broekman** (Hydrografische Dienst) and **Niels Nijhuis** (Caris): From point cloud to bathymetric digital elevation model
2. **Wilbert Brink** (Fugro): Overview of techniques to collect subsea point cloud data
3. **Edward Verbree** (TU Delft): Connecting indoor and outdoor - Insight through explorative point clouds (MSc Geomatics Synthesis project)

11:00 COFFEE/TEA BREAK

11:30 SESSION 2

4. **Romulo Gonçalves** (NL eScience Center): LiDAR data exploration boosted by a column-store
5. **Albert Godfrind** (Oracle): Oracle support options for point clouds
6. **Theo Tijssen** (TU Delft): Point cloud data management benchmark: Oracle, PostgreSQL, MonetDB, and LAStools
7. **Oscar Martinez Rubi** (NL eScience Center): The AHN2 3D web viewer and download tool

12:50 LUNCH

Programme, after lunch

13:50 SESSION 3

8. **Oscar Martinez Rubi** (NL eScience Center): The AHN2 3D web viewer and download tool
9. **Martin Kodde** (Fugro): Massive point cloud processing in the cloud
10. **George Vosselman** (University of Twente): Automated extraction of 3D building models and street furniture from point clouds
11. **Xuefeng Guan** (Wuhan University, China): Parallel streaming Delaunay triangulation for LiDAR

15:10 COFFEE/THEA BREAK

15:40 SESSION 4

12. **Wiebe de Boer** (Deltares): Point clouds in the Delta
13. **Milan Uitentuis and Mark Terlien** (IntellinQ): Managing and processing massive amounts of maritime point cloud data with GeolinQ
14. **Bart De Lathouwer** (OGC): Reporting from the OGC Point Cloud DWG

16:40 CLOSING DISCUSSION/PROPOSITIONS

17:00 DRINKS

A lot of future work (even after our project...)

- Massive point cloud data management, which list:
 - Multi-user testing (based on collected use patterns)
 - Discrete LoD testing (perspective views)
 - Investigate continuous LoD
 - 3D Webviewer/download tool, add more countries (“OpenPointCloudMap”, with upload facility)
- nD-PointCloud (submitted H2020 FET Open): <http://nd-pc.org>



OpenPointCloudMap

- 3D Webviewer/download tool will be operational after project:
 - 3TU.Datacentrum will host service
 - Fugro will do functional maintenance
- OpenPointCloudMap, pilot next phase will select data cases from:
 - more countries (UK, Denmark, etc.)
 - include time series of point clouds
 - add different data sets, (local) higher density, different attributes
 - point cloud from different nature: wet and dry
 - dense matching stereo, PS-InSAR, MBES,..
- Possible new functionality:
 - play with point cloud layers (on/off, styling)
 - compare point cloud (differences), temporal/other animation
 - redesign architecture (distributed serving/standardized protocols)

→Participate with data, get in contact

Propositions

- The free lines of sight (pointless space) between the observation platform and the observed point cloud of a surface give more information about the environment than the reconstructed surface

Propositions

- Developing standards for accessing and publishing point clouds. PDAL is a great step forward but the next step is now to get the tool developers to implement it (lastools ?)

Propositions

- Consider how LiDAR data and Satellite data (non-point cloud) both co-exist. Soon we will have tons of data from Copernicus, how such data should/could be combined with LiDAR data

Propositions

- You can better use a file and not a DBMS for managing point clouds
- AHN3 should also have RGB
- More efficient to do dense stereo matching than Lidar data acquisition: point density is higher, you also get RGB, and areal images are obtained annually anyhow

Interested?

- Join OGC's Point Cloud DWG
<http://www.opengeospatial.org/projects/groups/pointclouddwg>
- More reading (besides 3D GeoInfo keynote paper in Springer book) van Oosterom, P., Martinez-Rubi, O., Ivanova, M., Horhammer, M., Geringer, D., Ravada, S., Tijssen, T., Kodde, M., Gonçalves, R.: *Massive point cloud data management: Design, implementation and execution of a point cloud benchmark*. Computers and Graphics 49, 92 – 125 (2015).
- Presentations of seminar 8 dec'15, Delft NL: *"Management of massive point cloud data: wet and dry (2)"* will be on-line (at NCG, OGh, and pointclouds.nl websites)
- Try our 640.000.000.000 points web-based 3D pointcloud viewer yourself at <http://ahn2.pointclouds.nl> (comments welcome)
- 3D GeoInfo/3D Cadastres, 18-21 October 2016, Athens



It is our great pleasure to invite you all to the Joint 3D Athens Conference 2016, Greece

3DGeinfo

11th 3D Geoinfo Conference
20-21 October 2016
<http://3dgeoinfo.com>

3D Cadastres

5th International Workshop on 3D Cadastres
18-20 October, 2016
<http://www.gdmc.nl/3dcadastres/>