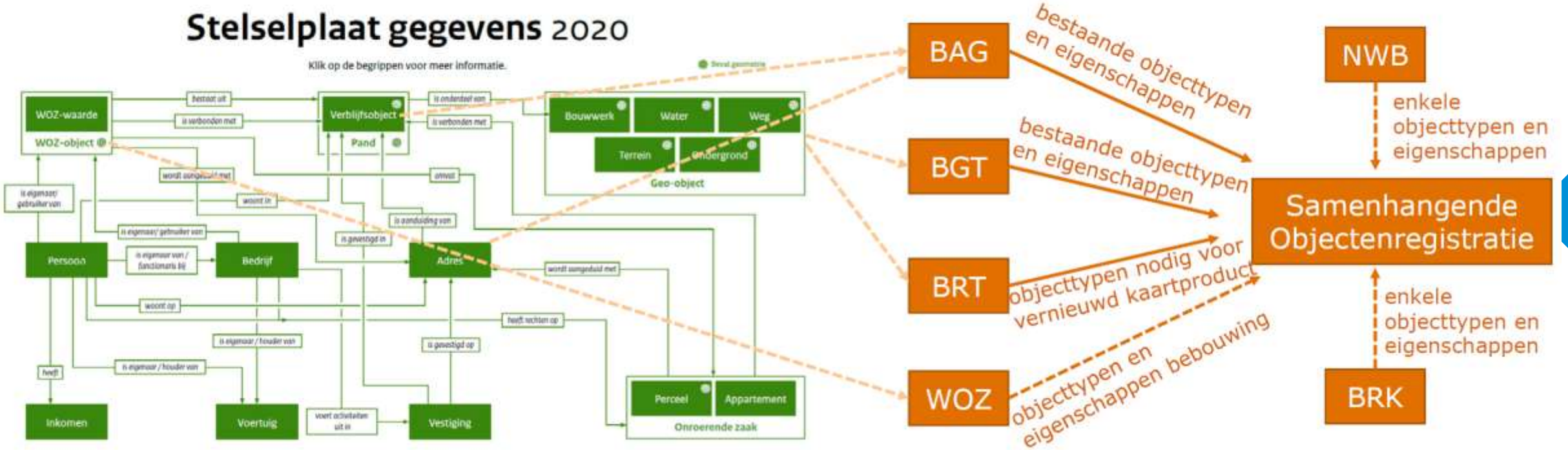
GEODELTA

Point Clouds as a Base Layer

Martin Kodde
30 October 2023

How do we get geo-information of the right quality?


Stelselplaat gegevens 2020
Klik op de begrippen voor meer informatie.
WOZ-waarde
WOZ-object
Verblijfsobject
Pand
Bouwwerk
Water
Weg
Terrein
Ondergrond
Geo-object
Persoon
Bedrijf
Adres
Perceel
Appartement
Onroerende zaak
Inkomen
Voertuig
Vestiging
BAG
BGT
BRT
WOZ
bestaande objecttypen en eigenschappen
bestaande objecttypen en eigenschappen
objecttypen nodig voor vernieuwd kaartproduct
objecttypen en eigenschappen bebouwing
NWB
enkele objecttypen en eigenschappen
Samenhangende Objectenregistratie
enkele objecttypen en eigenschappen
BRK

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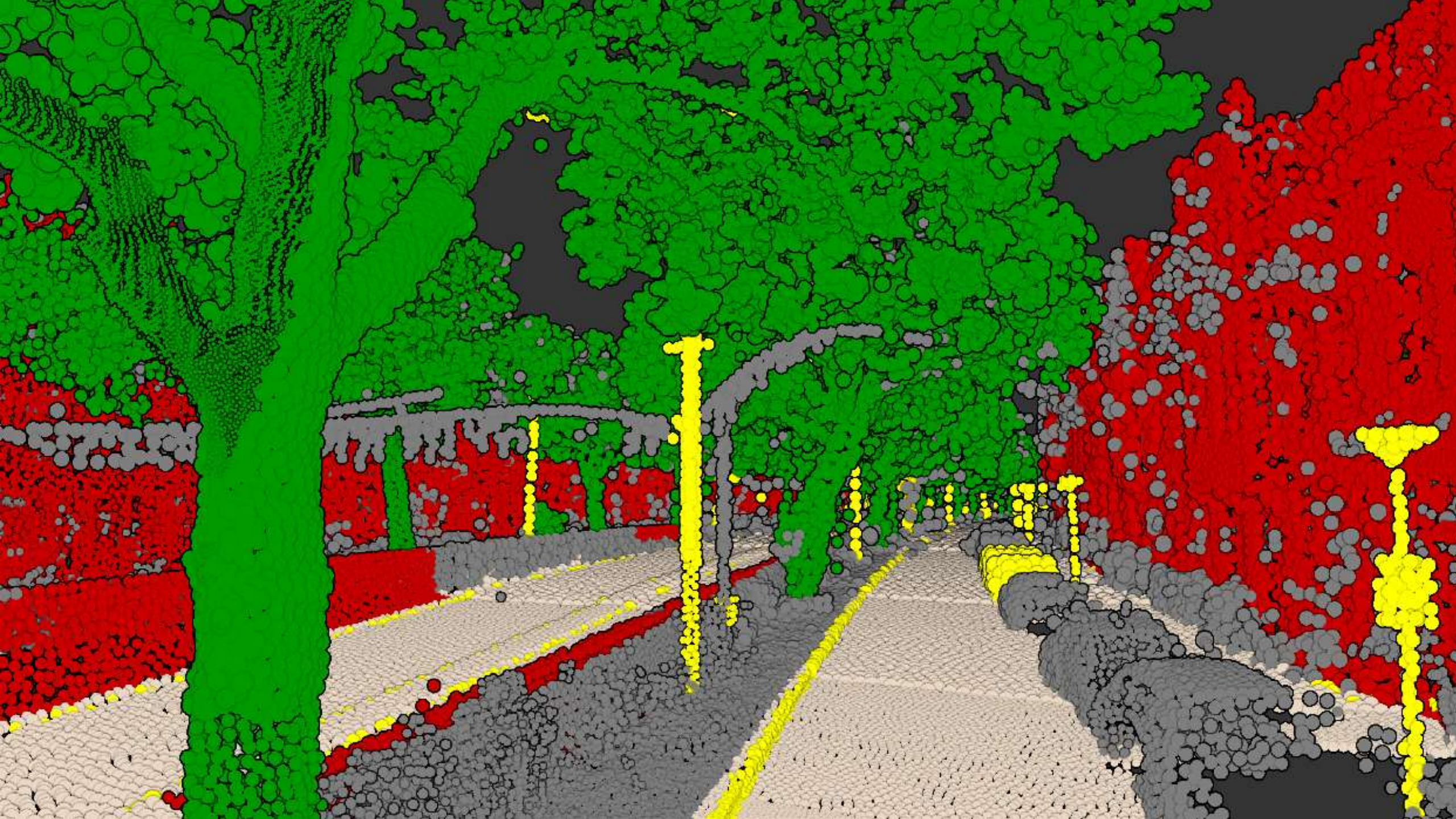

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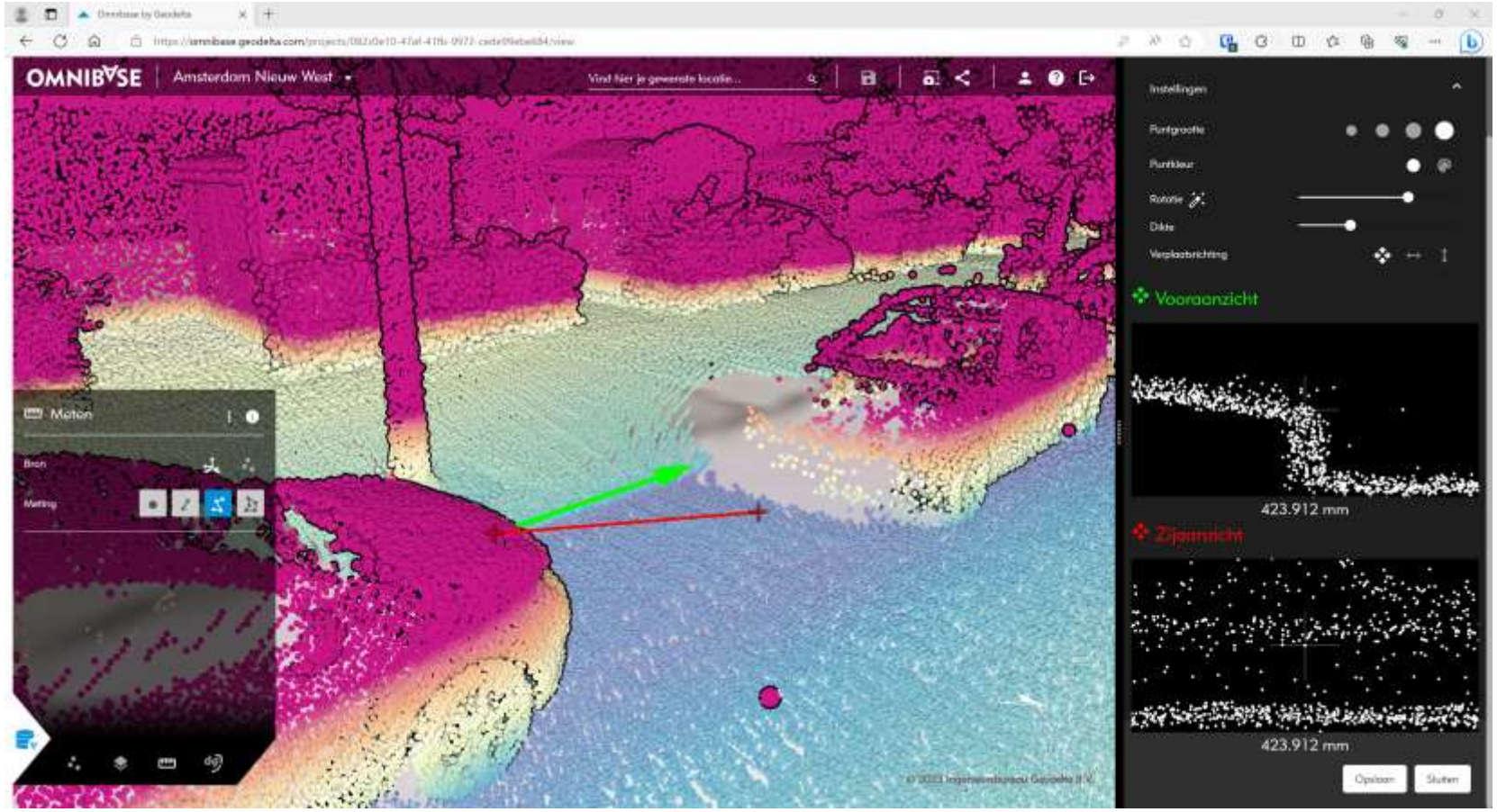
Omnibase



- Online environment for using (very large) point clouds and images.
- Designed for 3D mapping and deformation analysis.
- The foundation for the Point Cloud Base Layer (Basisvoorziening puntenwolken)

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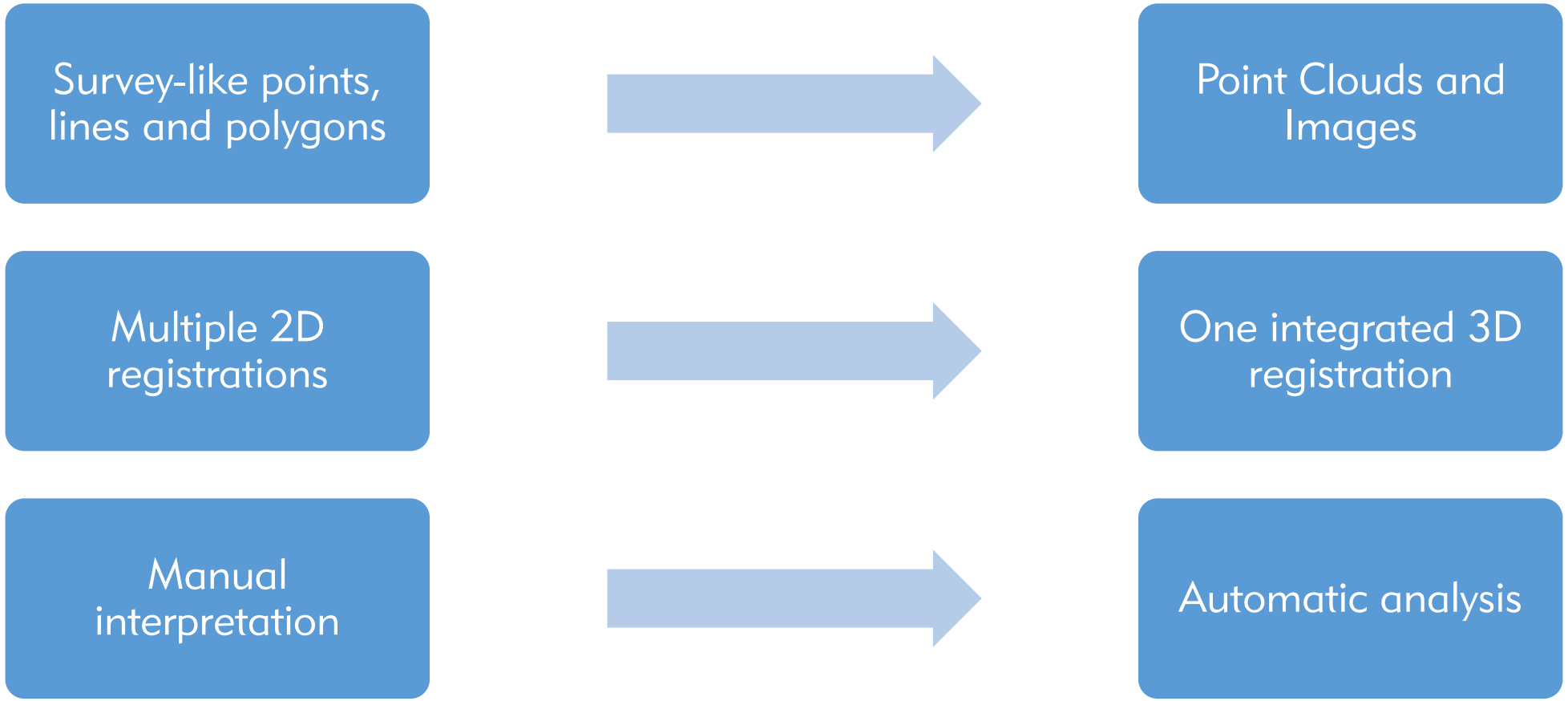
Three developments



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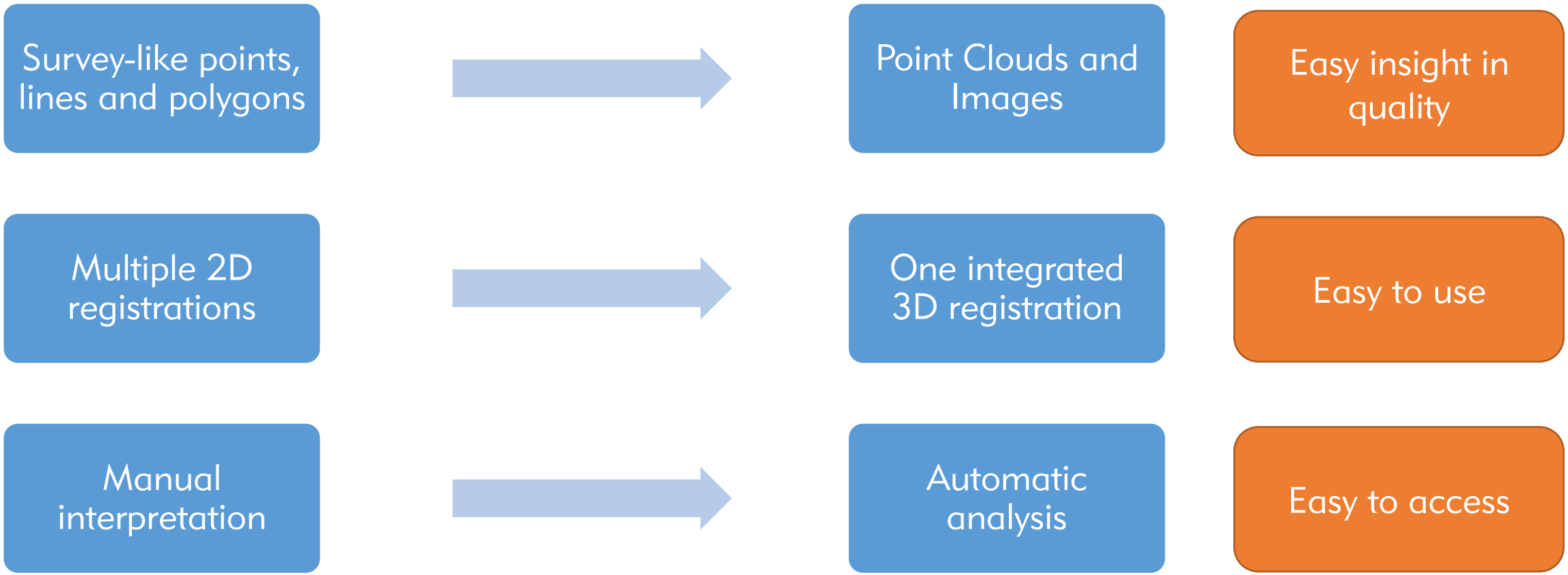
Three developments



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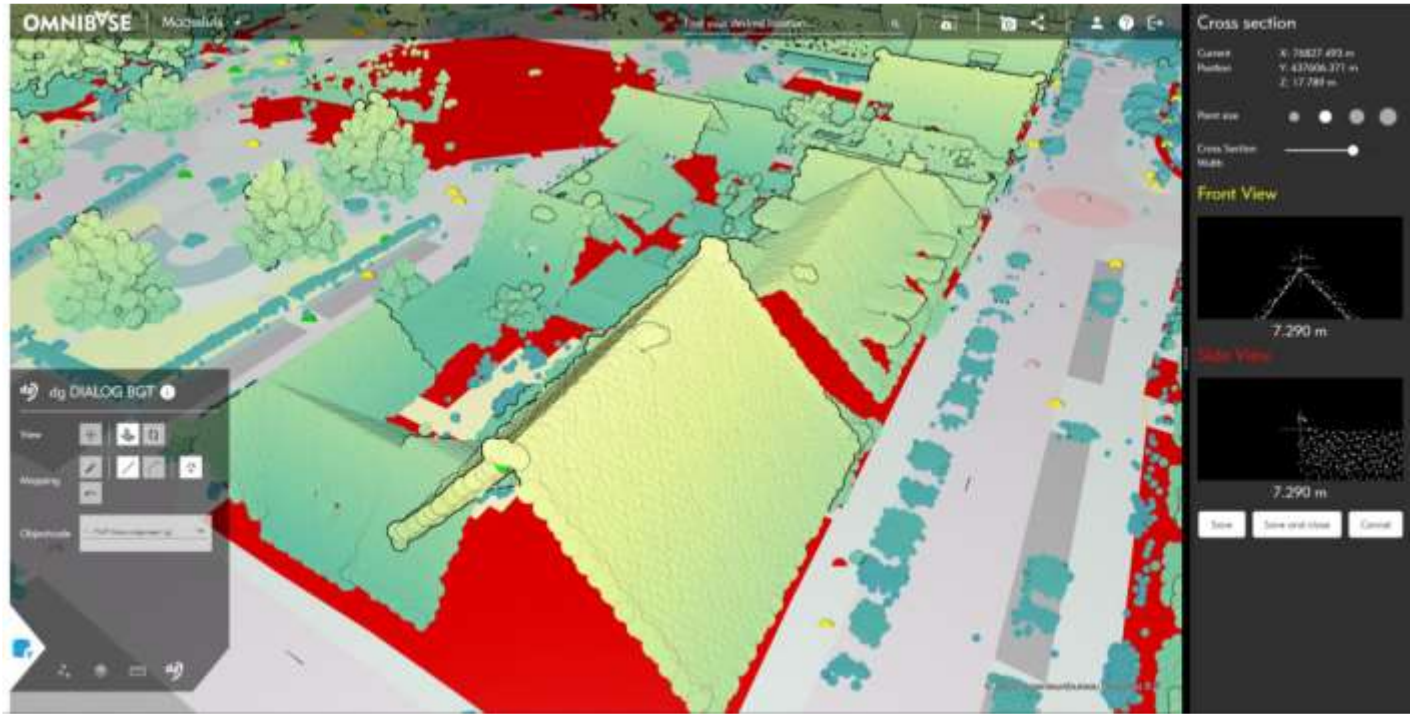
Easy insight in quality

Easy to use

Easy to access



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Easy insight in quality

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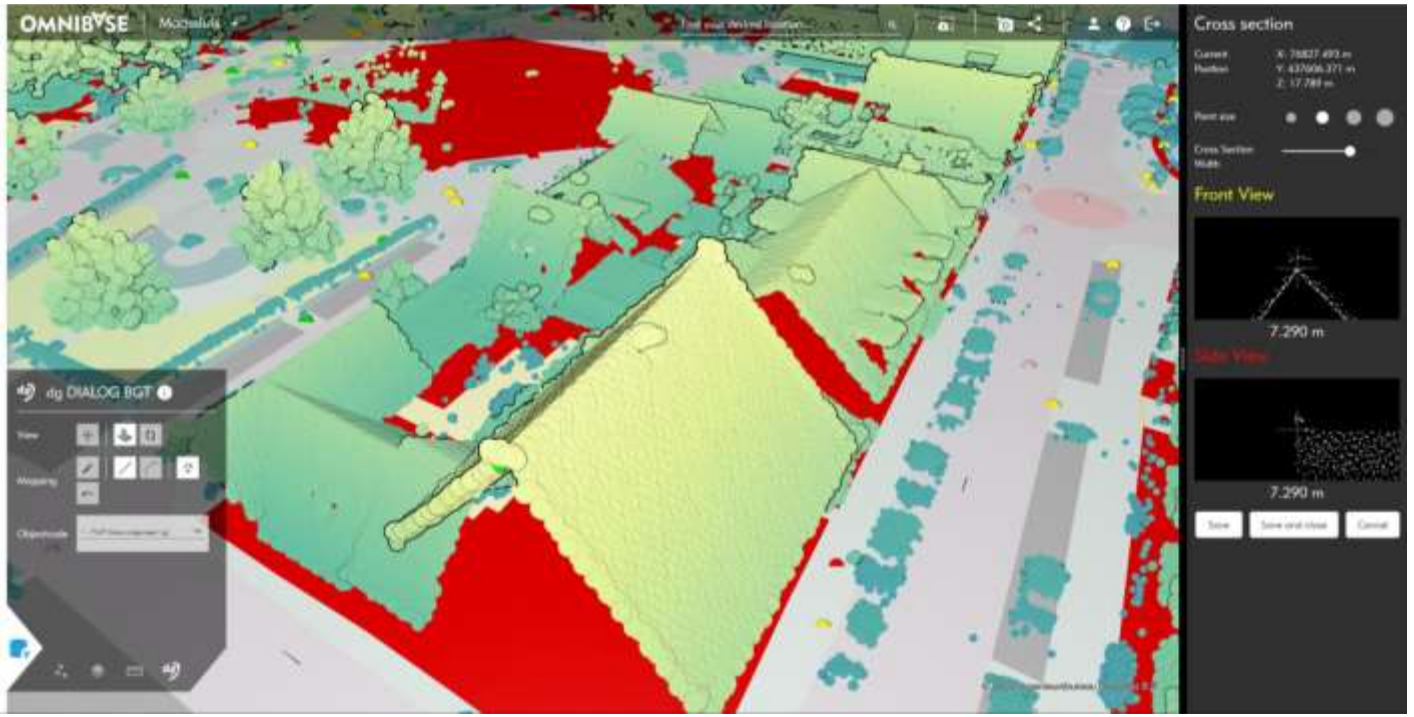
Easy to access

?



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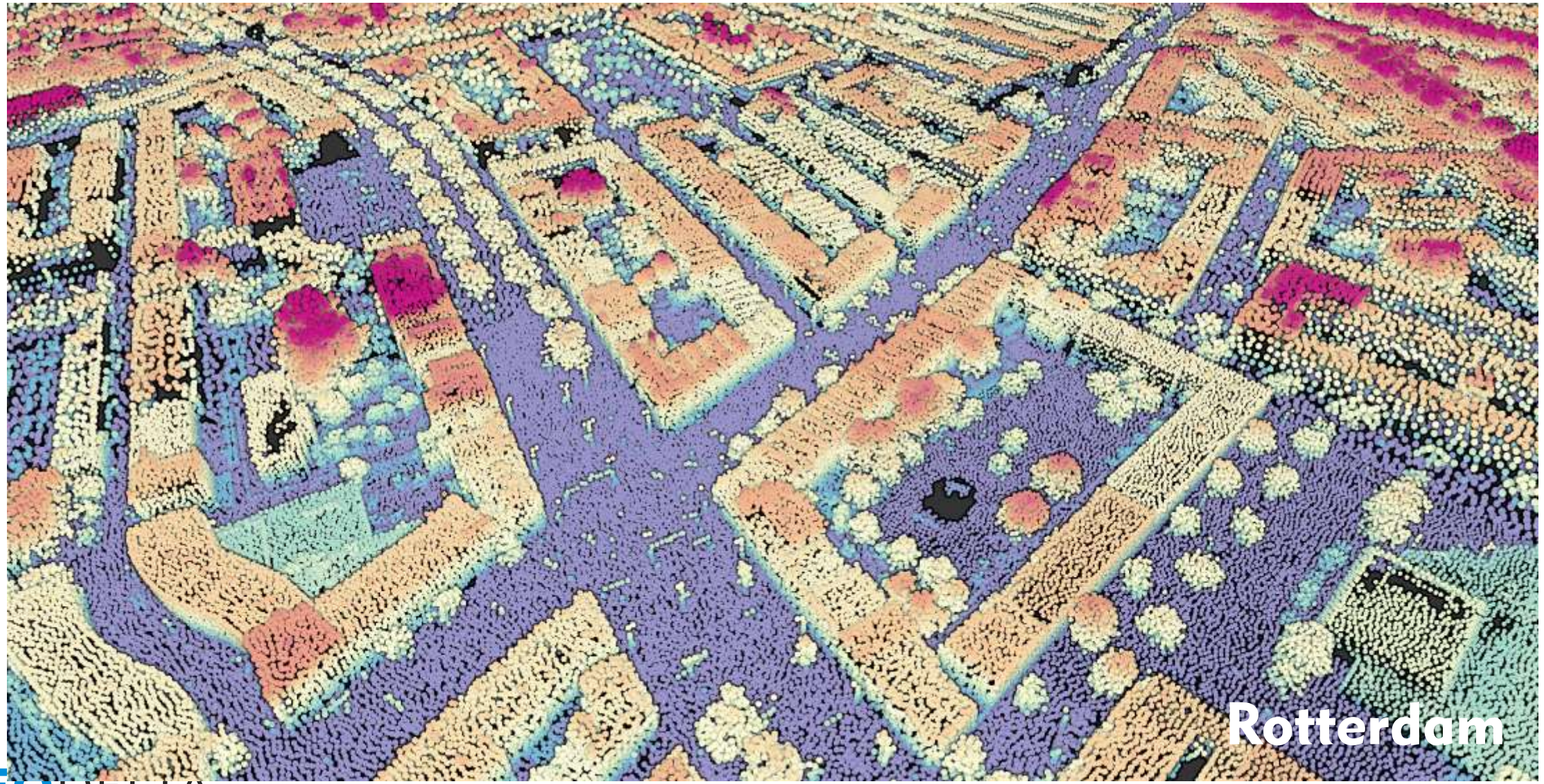
The Hague


Nicola
The Hague

AHN4



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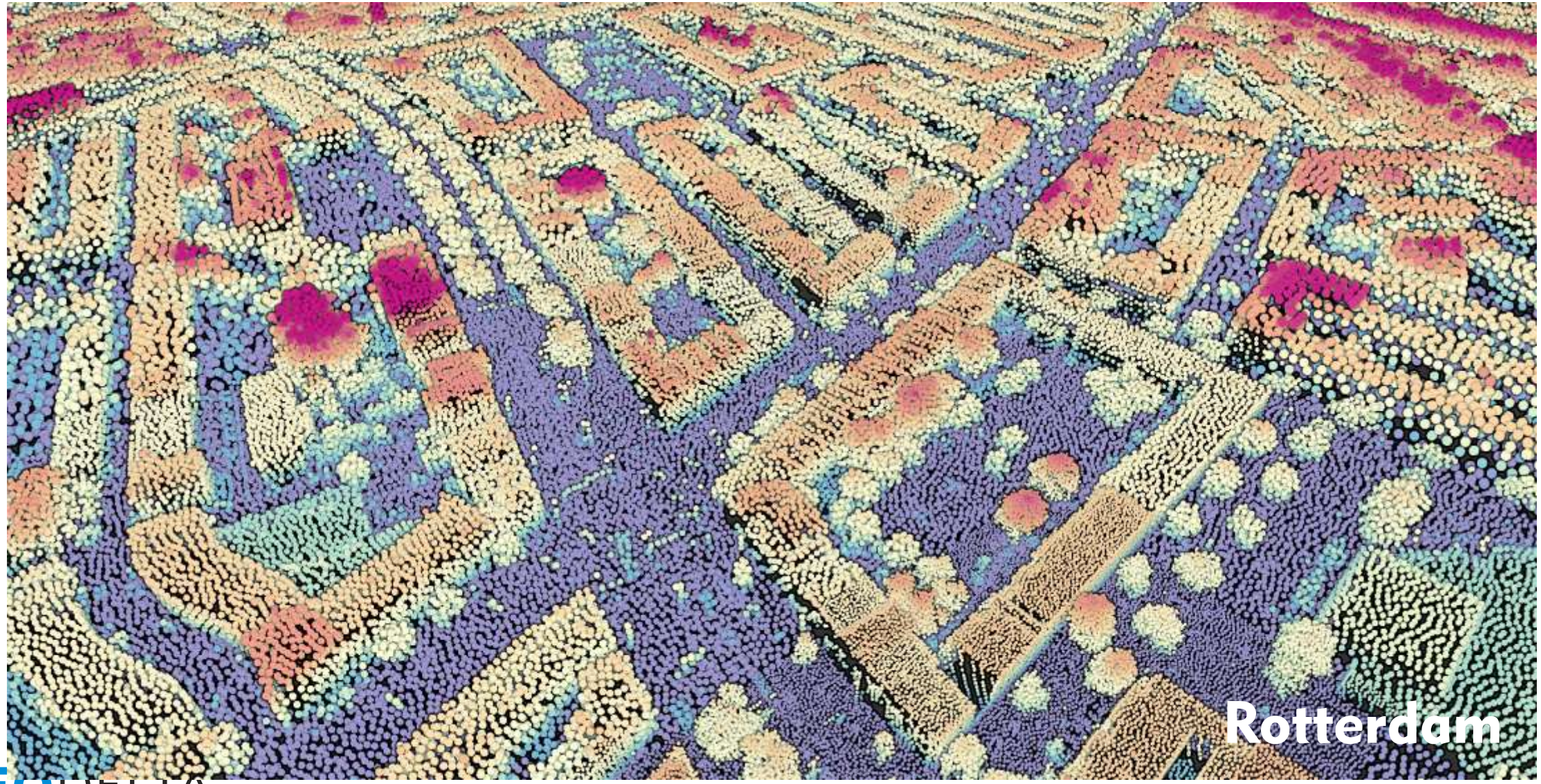
Airborne Laser Scanning 2021



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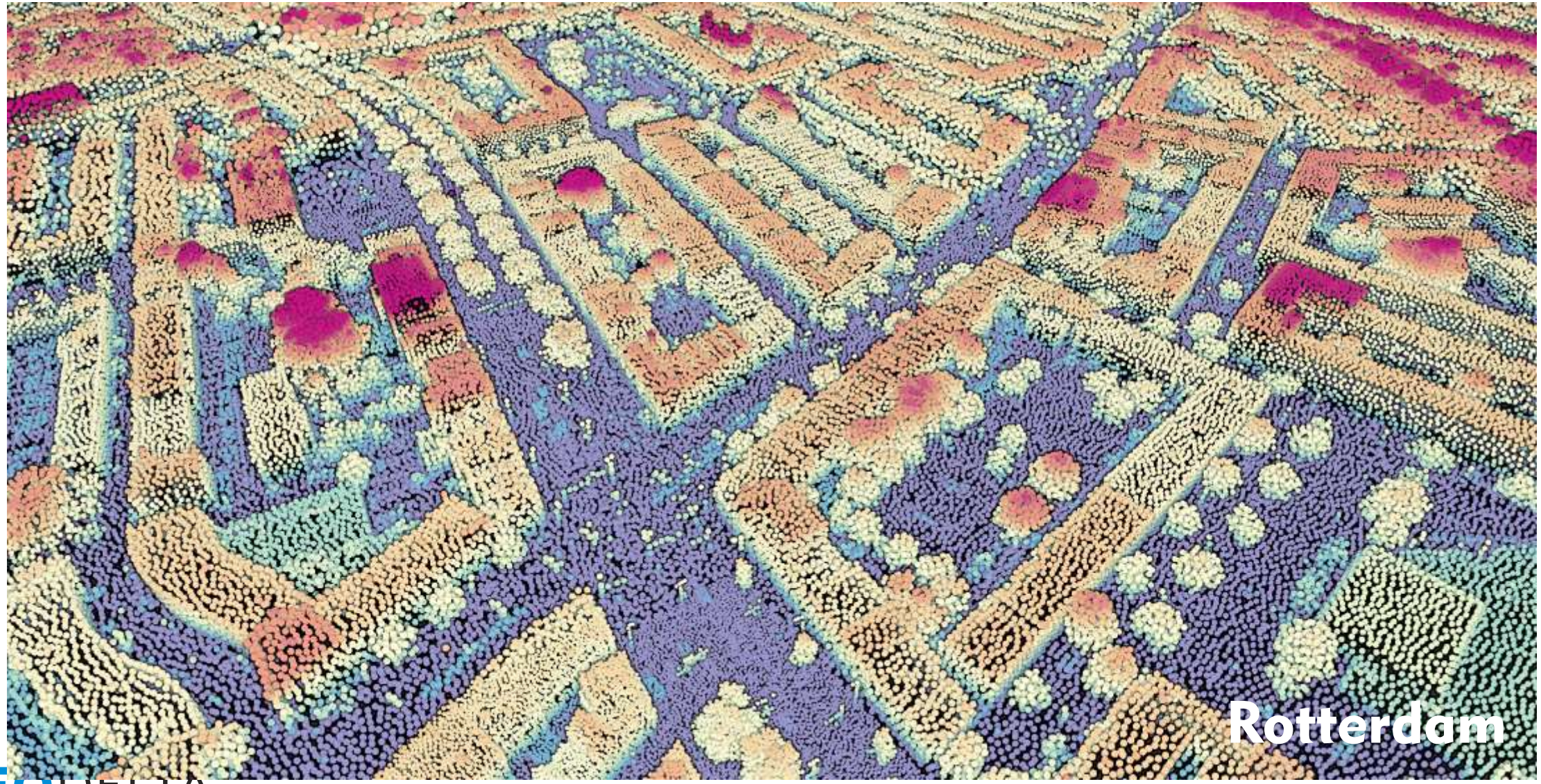
Airborne Laser Scanning 2022



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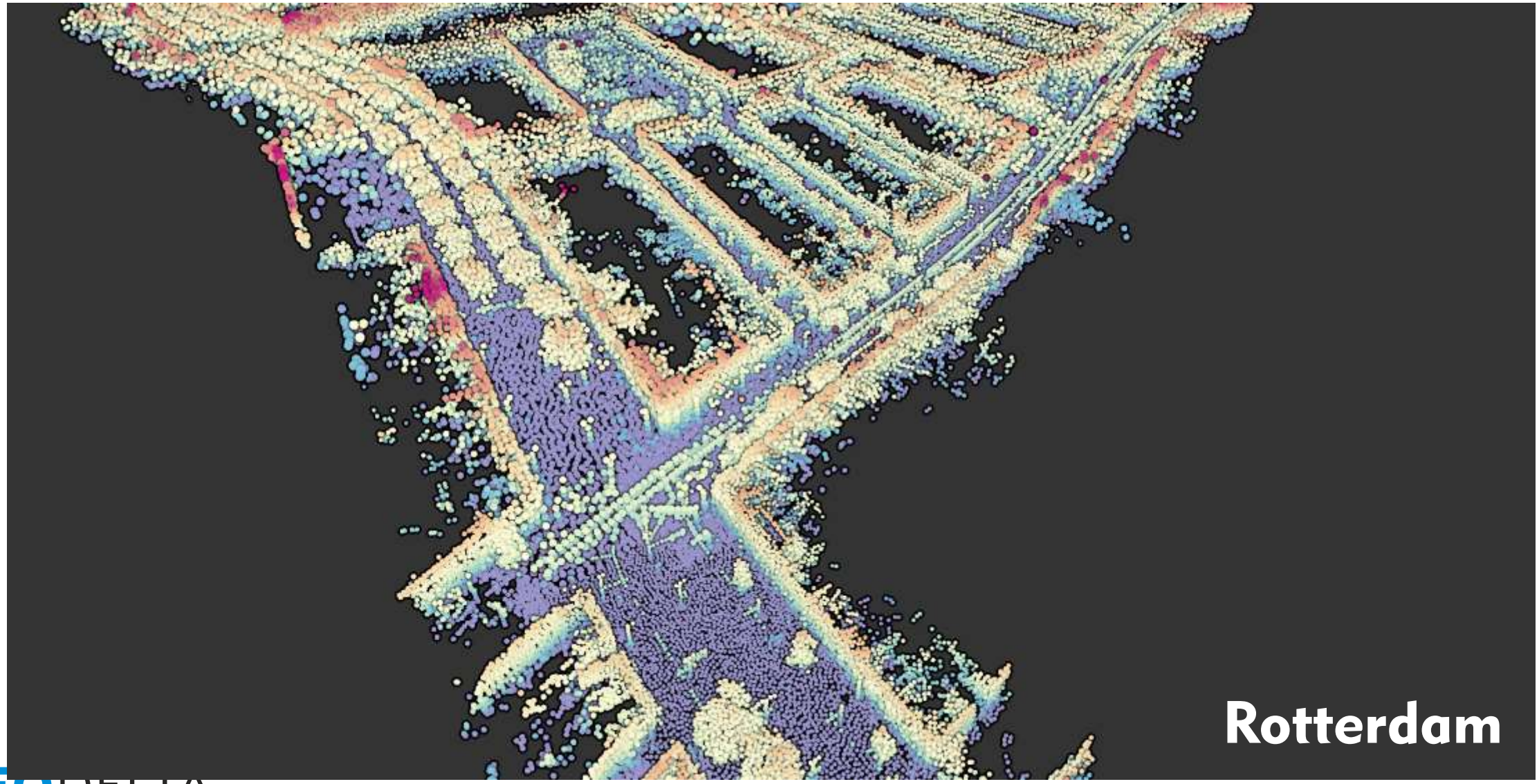
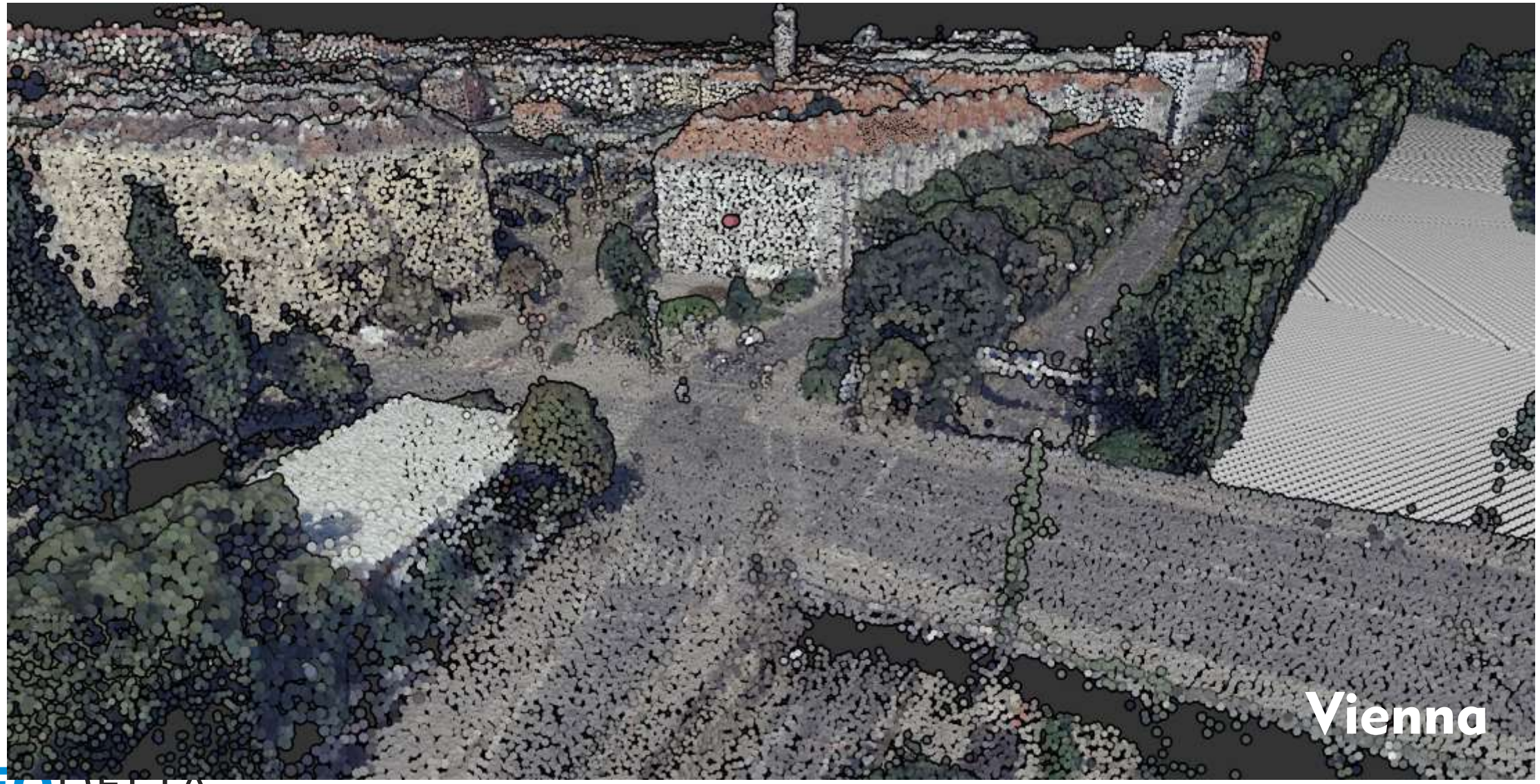
Mobile Laser Scanning

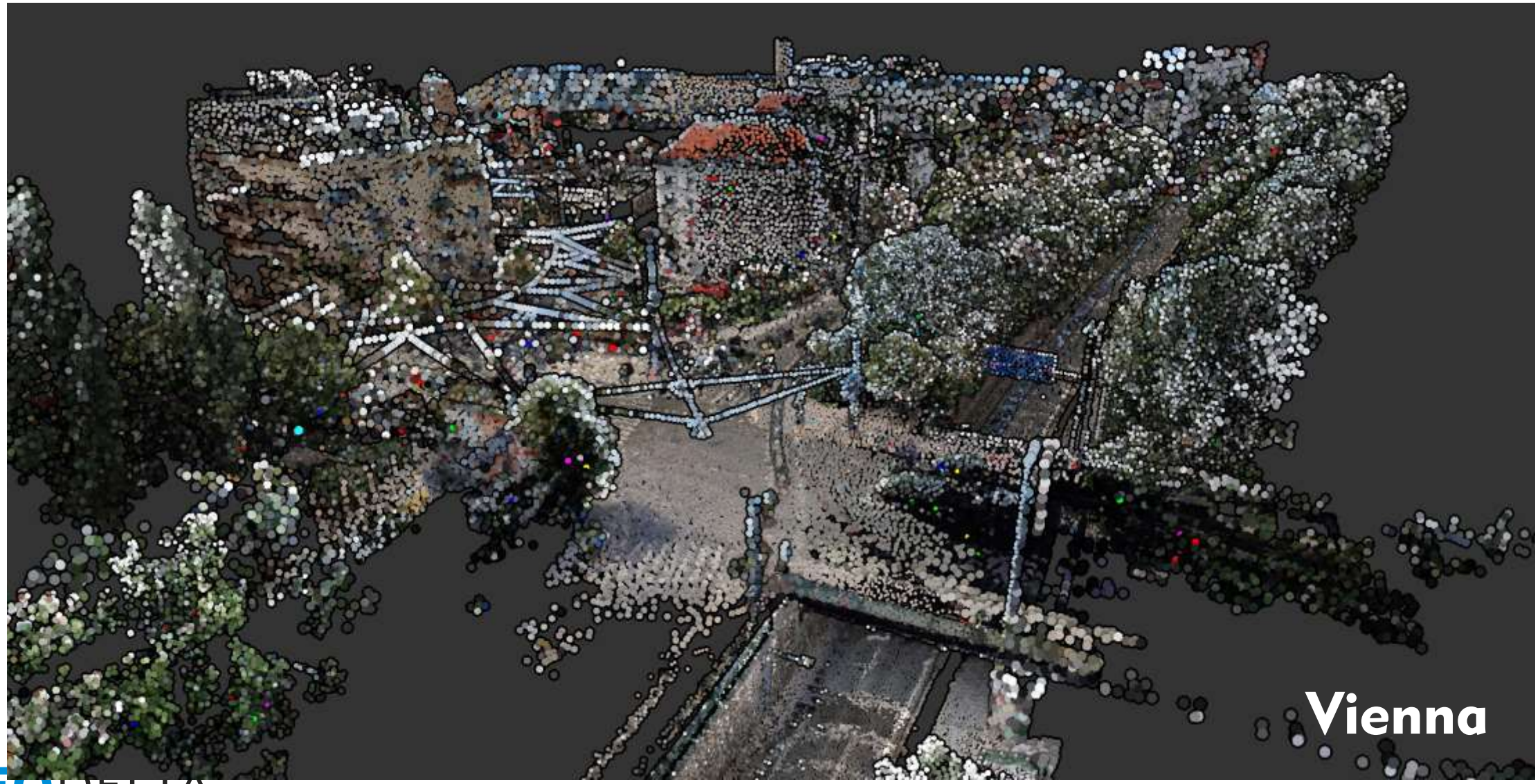


Airborne Laser Scanning

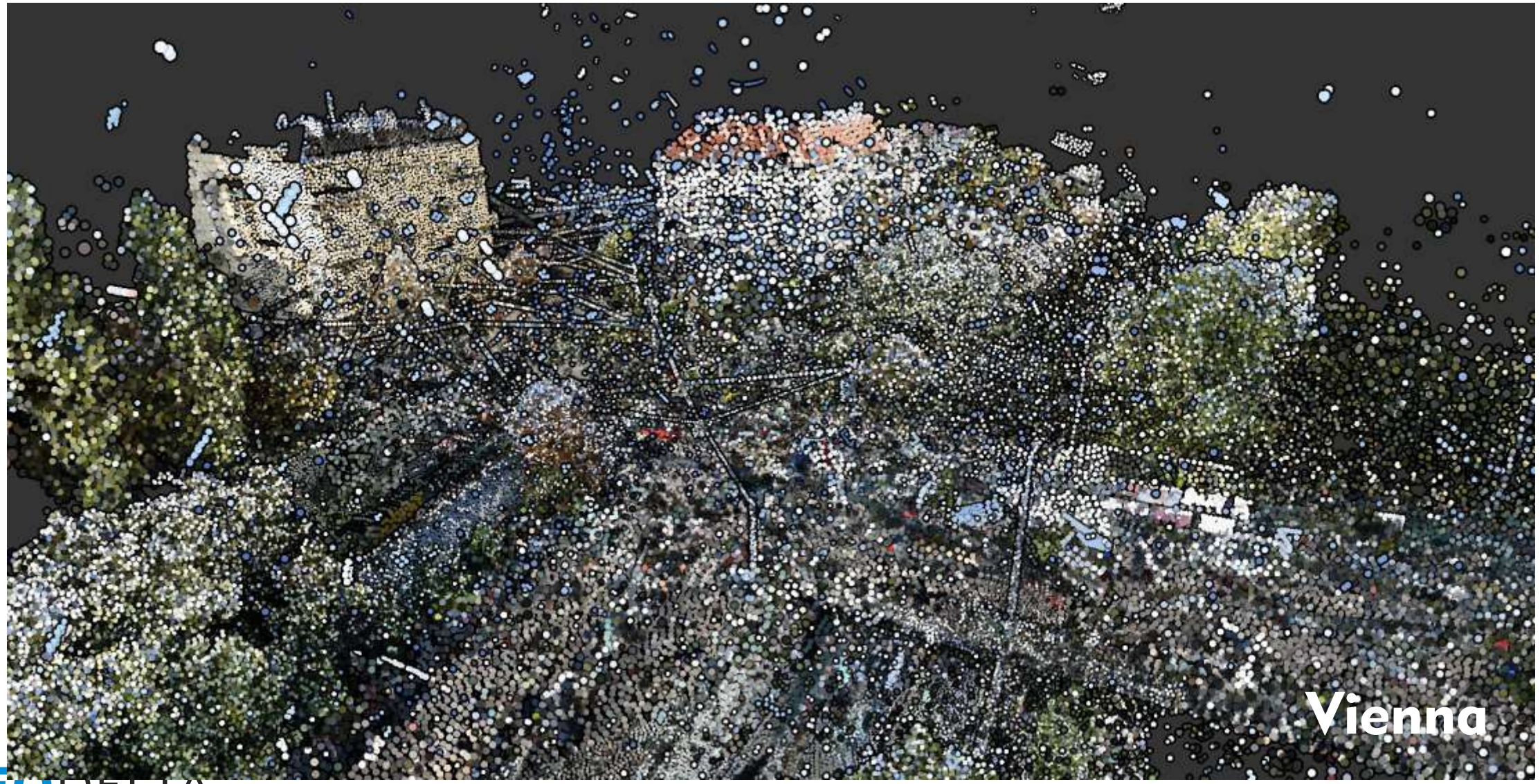
Airborne Dense Matching



Mobile Laser Scanning



Terrestrial Laser Scanning (unclassified)



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Terrestrial Laser Scanning (classified)

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Accuracy AHN4

- The absolute height deviations per reference object must meet the following requirement:
  - $68{,}2\% < 1 * \sigma_z + DZ$
  - $95{,}4\% < 2 * \sigma_z + DZ$
  - $99{,}7\% < 3 * \sigma_z + DZ$
- 10 cm error in height is possible
- 20 cm error in height difference is possible

Accuracy Mobile Mapping

The dimensional accuracy of (objects to be measured in) the LiDAR data must be < 2 cm.T his means that when measuring objects in the LiDAR data (think of: buildings, lamp posts, trees, width of footpaths, cycle paths and roads, traffic signs) the measured values may not deviate from the actual dimensions by more than 2 cm. This therefore concerns relative accuracy.

The LiDAR data must have a point density of at least 2500 points per m^2 measured in one vertical plane at a distance of 10 meters from the recording point

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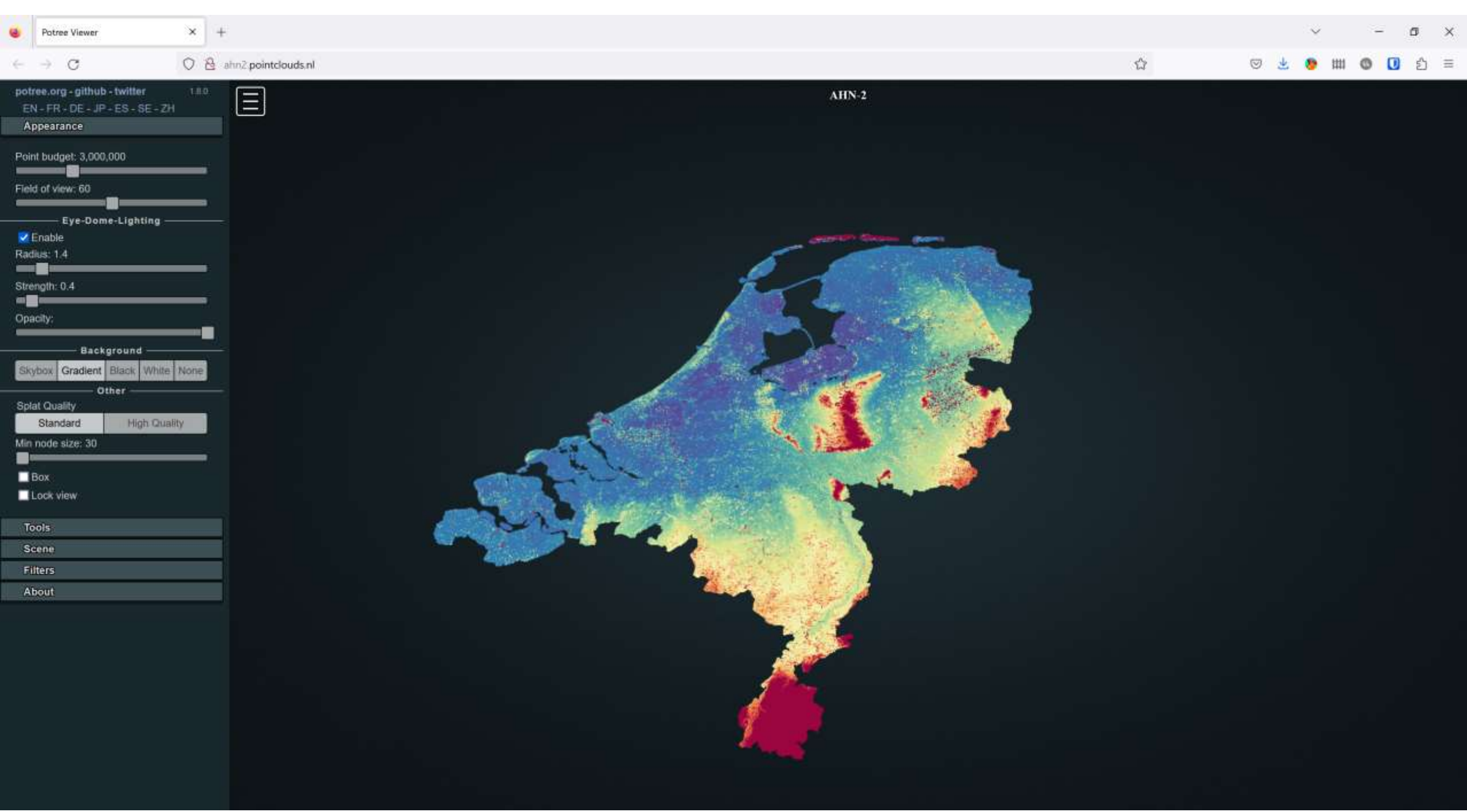
Potree Viewer
ahn2.pointclouds.nl
potree.org - github - twitter
1.8.0
EN - FR - DE - JP - ES - SE - ZH
Appearance
Point budget: 3,000,000
Field of view: 60
Eye-Dome-Lighting
Enable
Radius: 1.4
Strength: 0.4
Opacity:
Background
Skybox
Gradient
Black
White
None
Other
Splat Quality
Standard
High Quality
Min node size: 30
Box
Lock view
Tools
Scene
Filters
About
AHN-2

We miss integrated quality description of point clouds.

Quality of a point?

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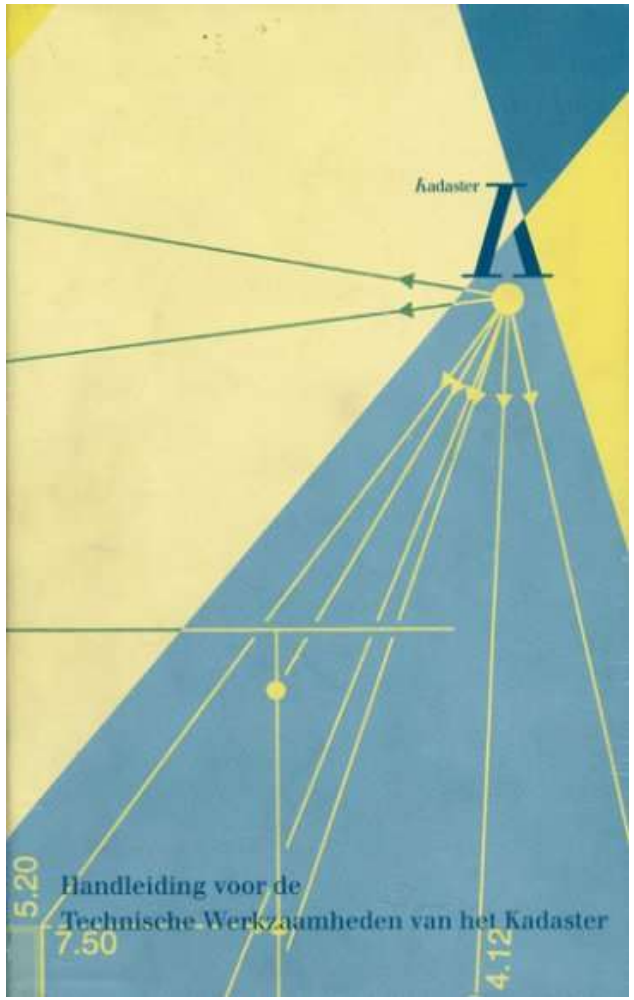
Quality of a point? Craftmanship!



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RIJKSDRIEHOEKSMETING. N°4.

Quality of a point cloud

- Accuracy
  - Spatial accuracy
  - Temporal accuracy
  - Thematic accuracy
- Resolution
  - Spatial resolution
  - Temporal resolution
  - Thematic resolution
- Coverage
- Completeness

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Systematic error	[max. value]
Stochastic error	[standard deviation]
Outliers	[percentage]

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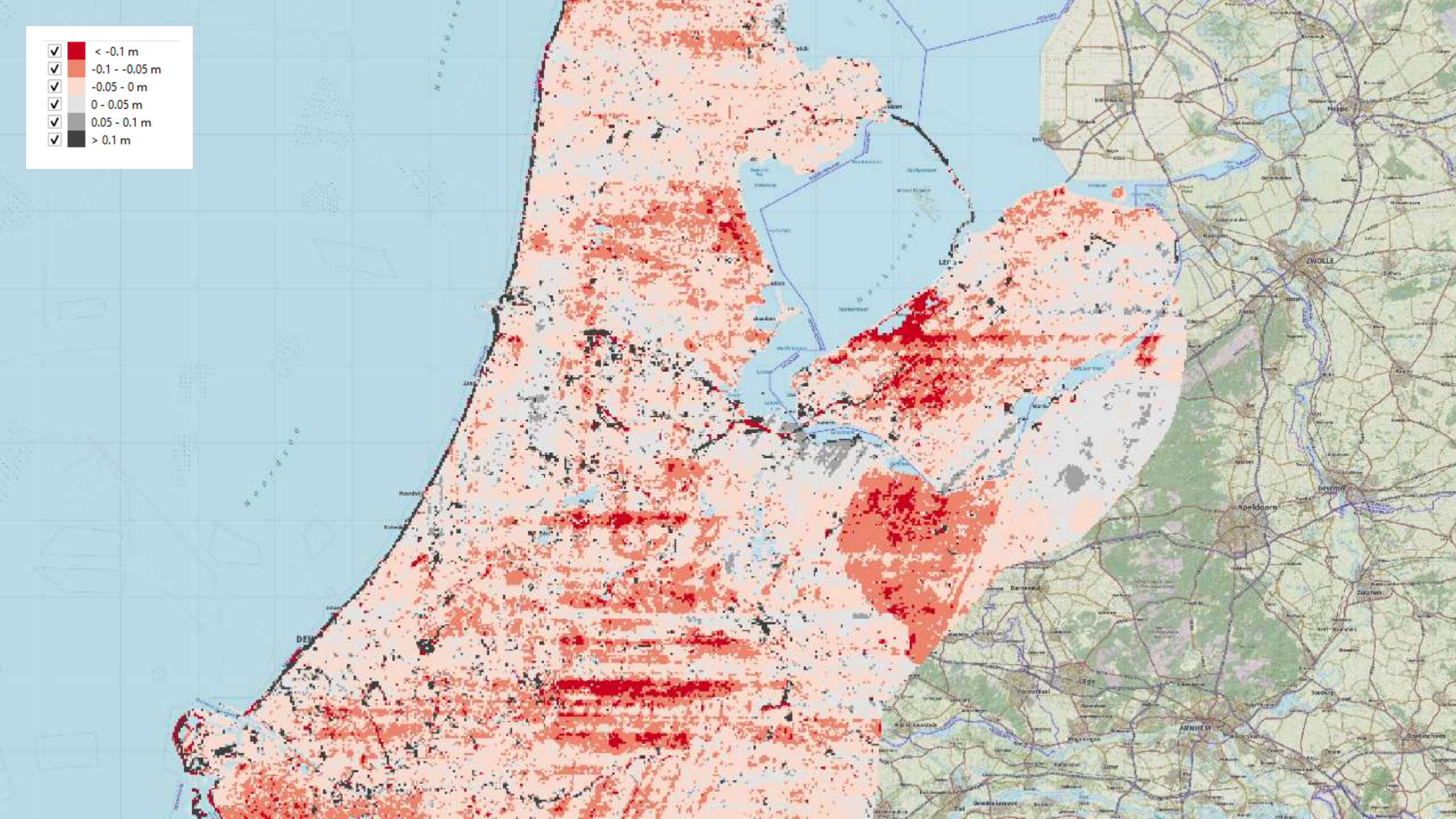
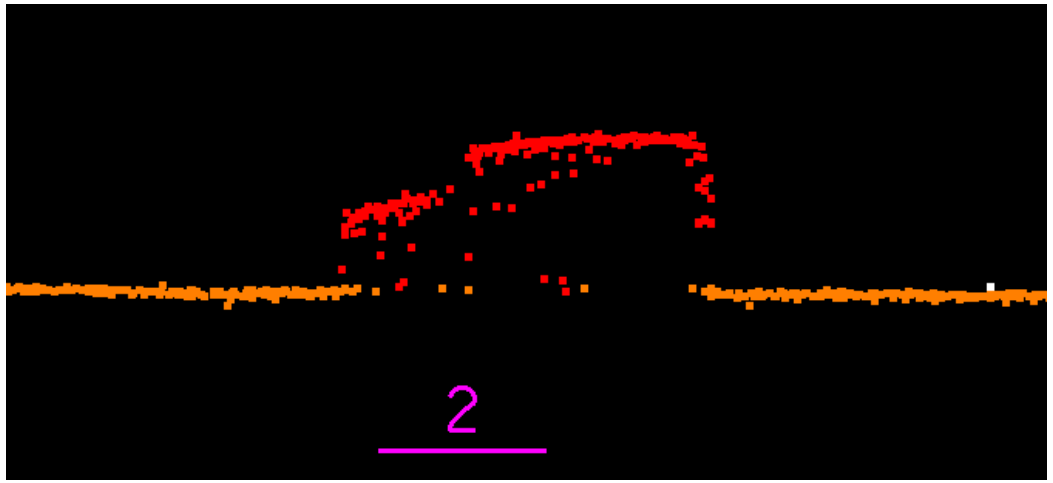
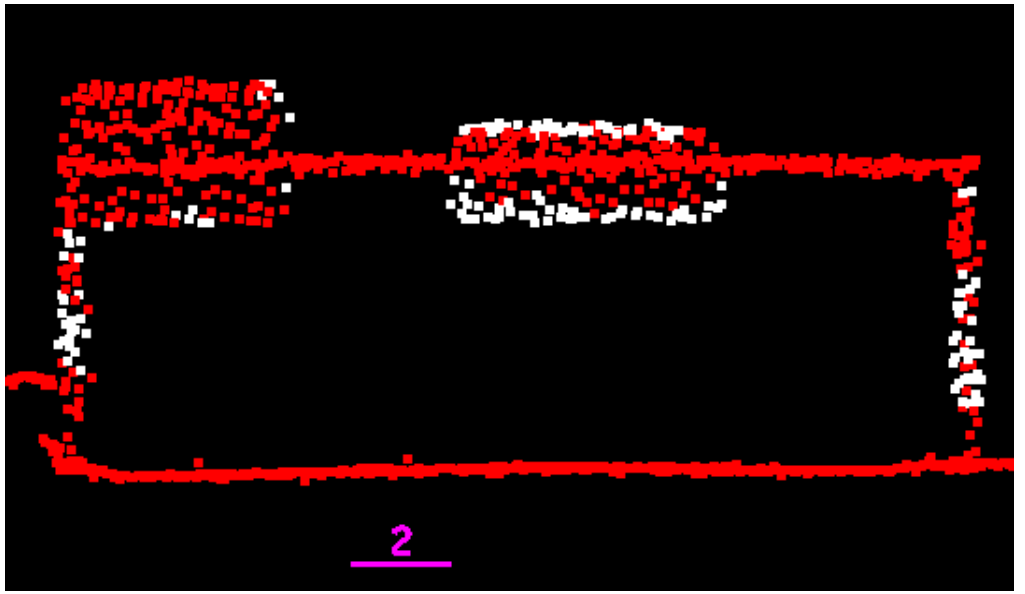

< -0.1 m
-0.1 - -0.05 m
-0.05 - 0 m
0 - 0.05 m
0.05 - 0.1 m
> 0.1 m
ZWOLLE
Apeldoorn
ARNHEM

Stochastic error





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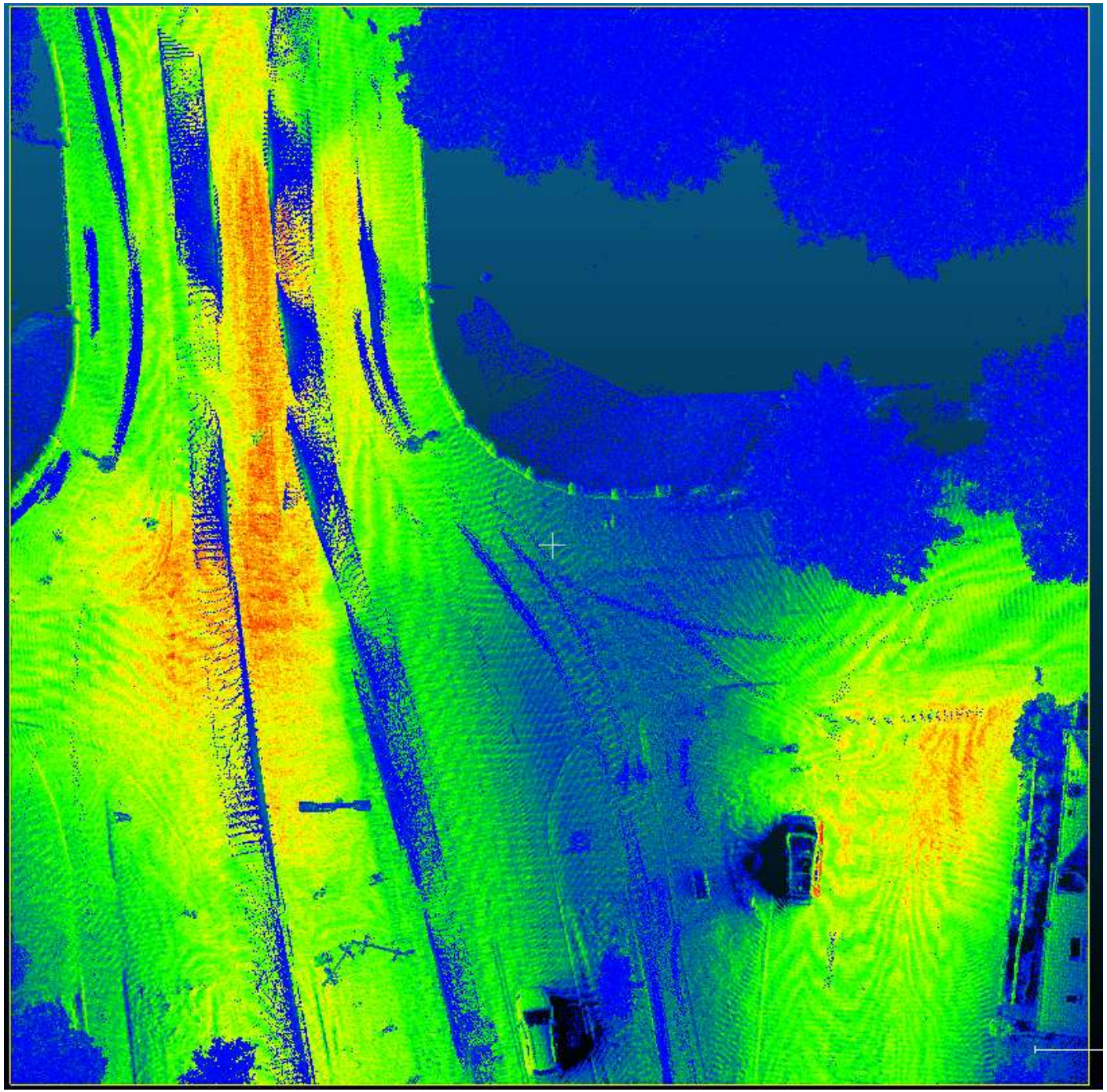
Spatial Resolution



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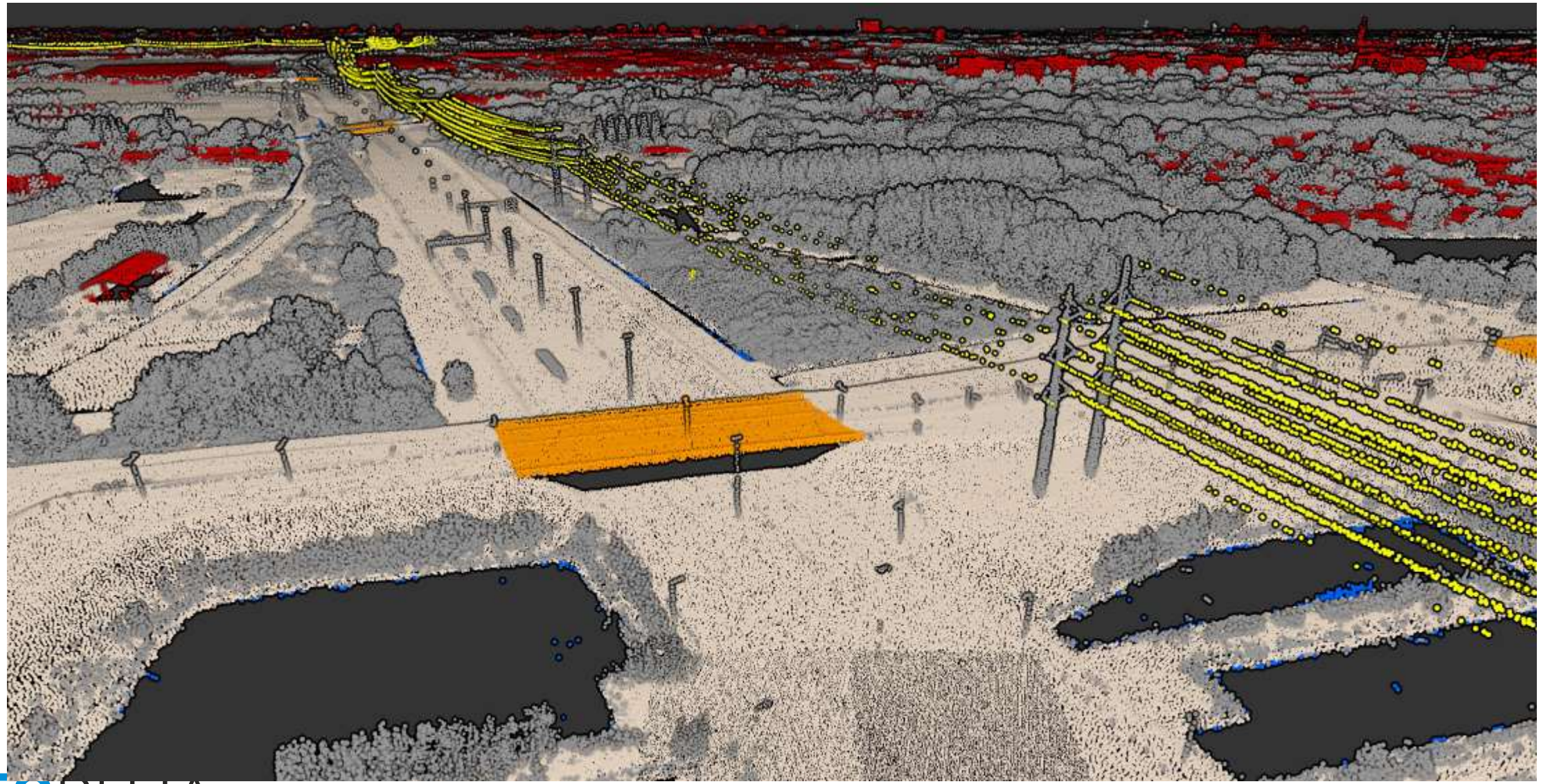
Thematic resolution



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Quality labels

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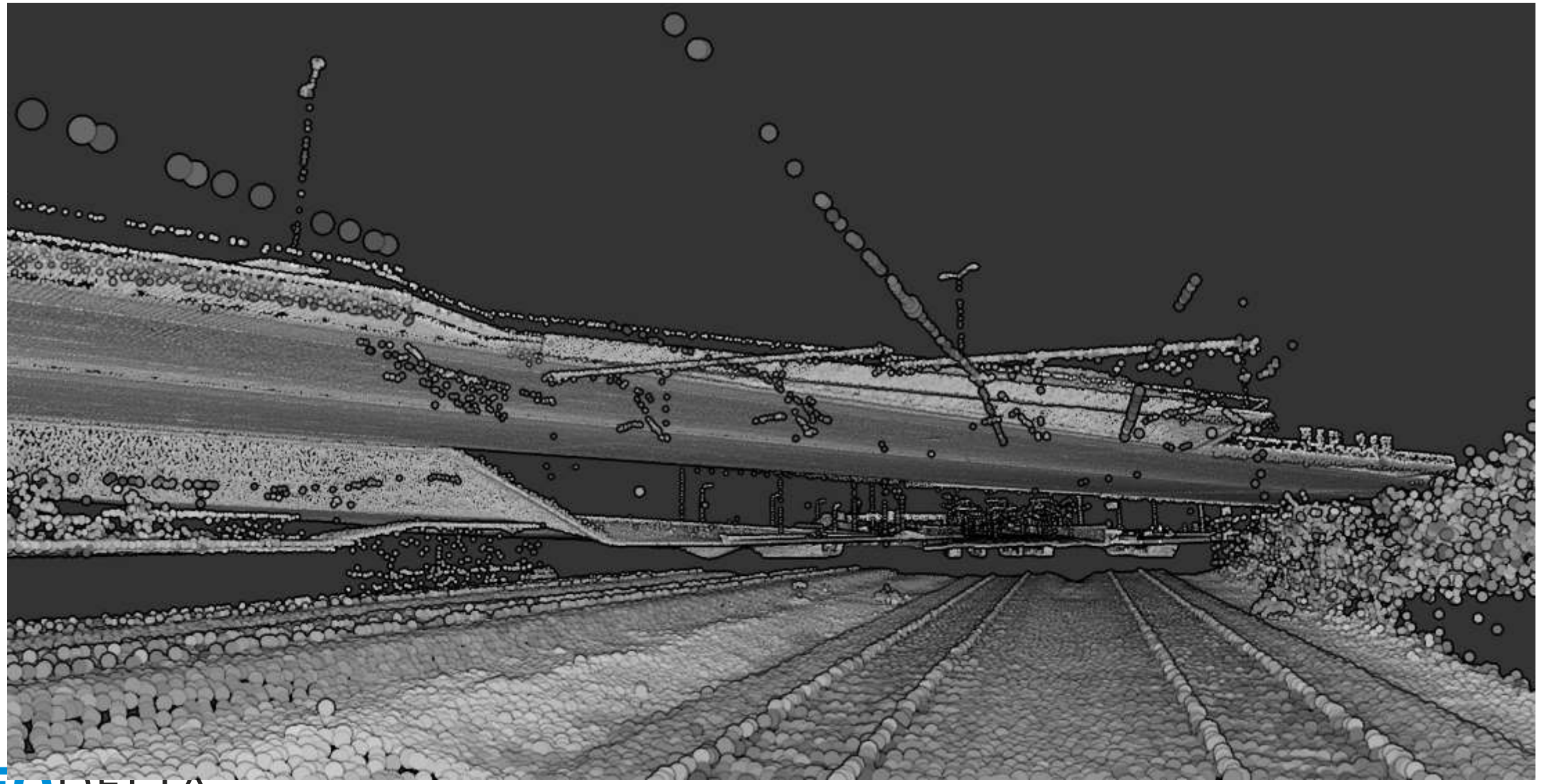
Quality labels



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A viewer, or an outlook?

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Can we integrate quality as part of an nD Point Cloud?

Quality of a point cloud

- Accuracy
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Thank you for your attention