

Részletes 3D épületmodellek országos szinten

FOSS4GHU 2021 Budapest, 2021-11-26

Dukai Balázs, Ravi Peters



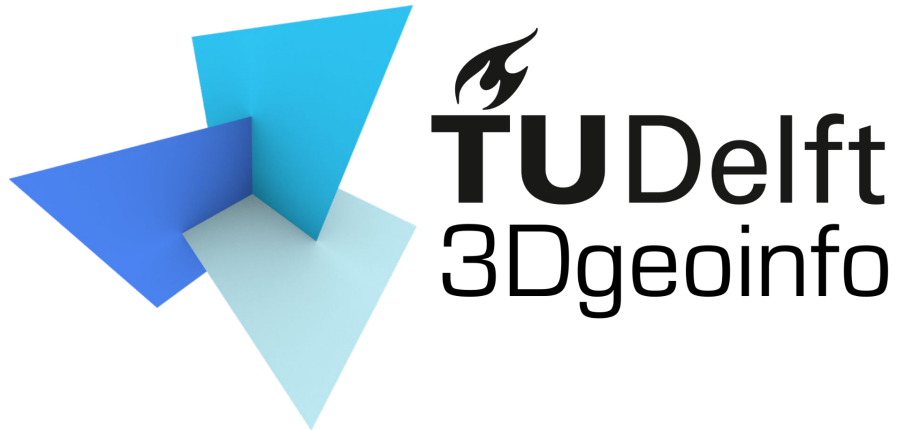

TU Delft
3Dgeoinfo

Magunkról

3D geoinformation research group

K+F 3D térinformatika, TU Delft

<https://3d.bk.tudelft.nl/>



3DGI

Kereskedelmi spin-off

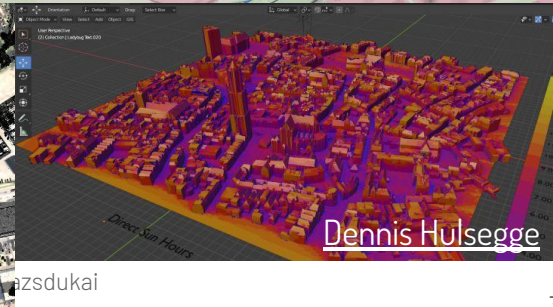
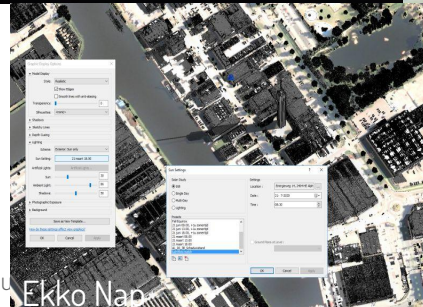
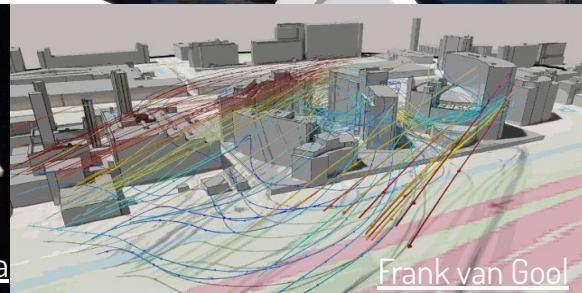
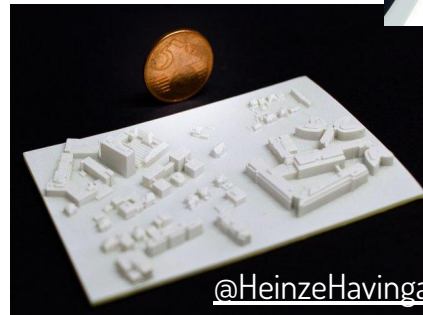
<https://3dgi.nl/>

3DGI

3D városmodellek, minek?

Általában ezekre:

- Solar potential analysis
- Heating demand estimation
- Urban planning
- Taxation
- Wind simulations
- Noise simulations
- 3D printing
- BIM
- Or just to look at it 🥰



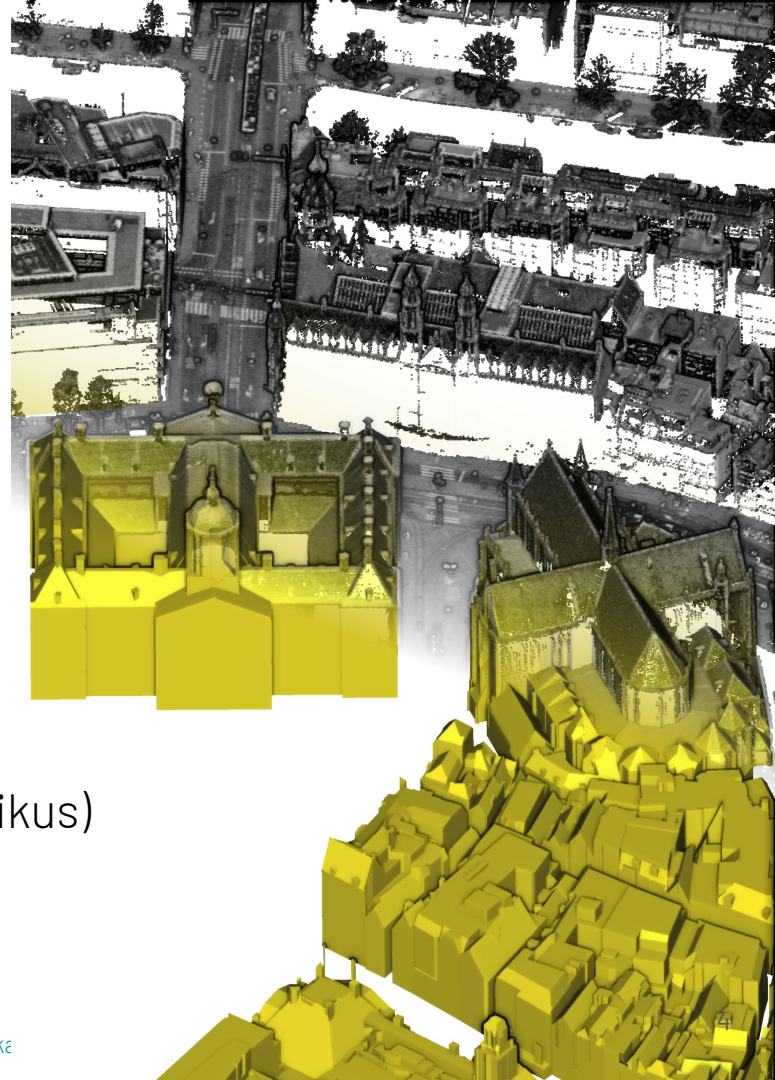
Nyílt adatok Hollandiában

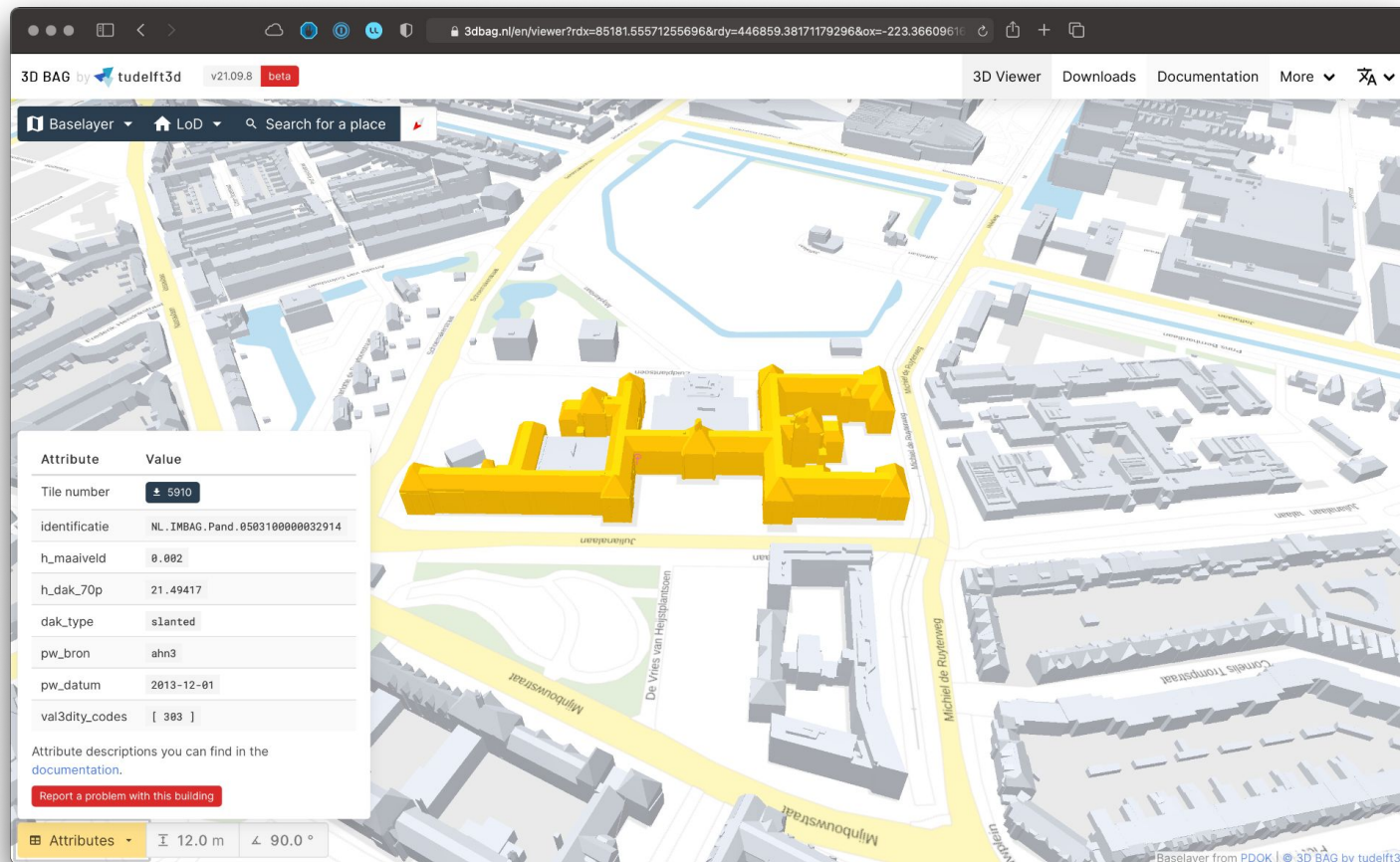
BAG <https://www.kadaster.nl/bag>

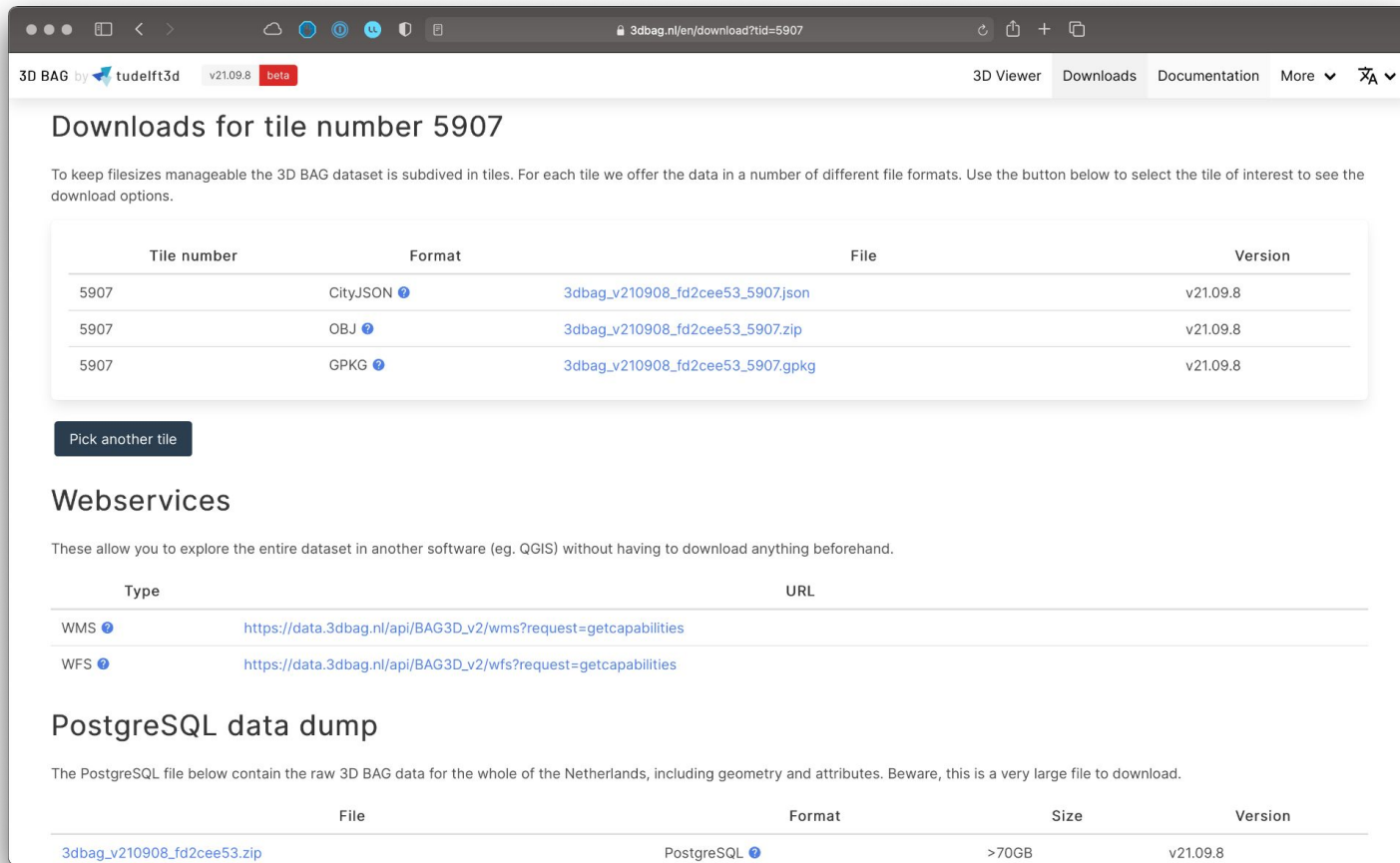
aktuális épület poligonok + tulajdonságok
legnagyobb terület → tetőkörvonal + földalatt
helyzeti pontosság 30cm

AHN <https://ahn.nl>

osztályozott pontfelhő
helyzeti pontosság ~23cm (magasság és planimetrikus)
8-15 pt/m² az épületekre
árnyékolás és egyéb adathiányos területek







3D BAG by  tudelft3d v21.09.8 beta

3D Viewer Downloads Documentation More  

Downloads for tile number 5907

To keep filesizes manageable the 3D BAG dataset is subdivided in tiles. For each tile we offer the data in a number of different file formats. Use the button below to select the tile of interest to see the download options.

Tile number	Format	File	Version
5907	CityJSON 	3dbag_v210908_fd2cee53_5907.json	v21.09.8
5907	OBJ 	3dbag_v210908_fd2cee53_5907.zip	v21.09.8
5907	GPKG 	3dbag_v210908_fd2cee53_5907.gpkg	v21.09.8

[Pick another tile](#)

Webservices

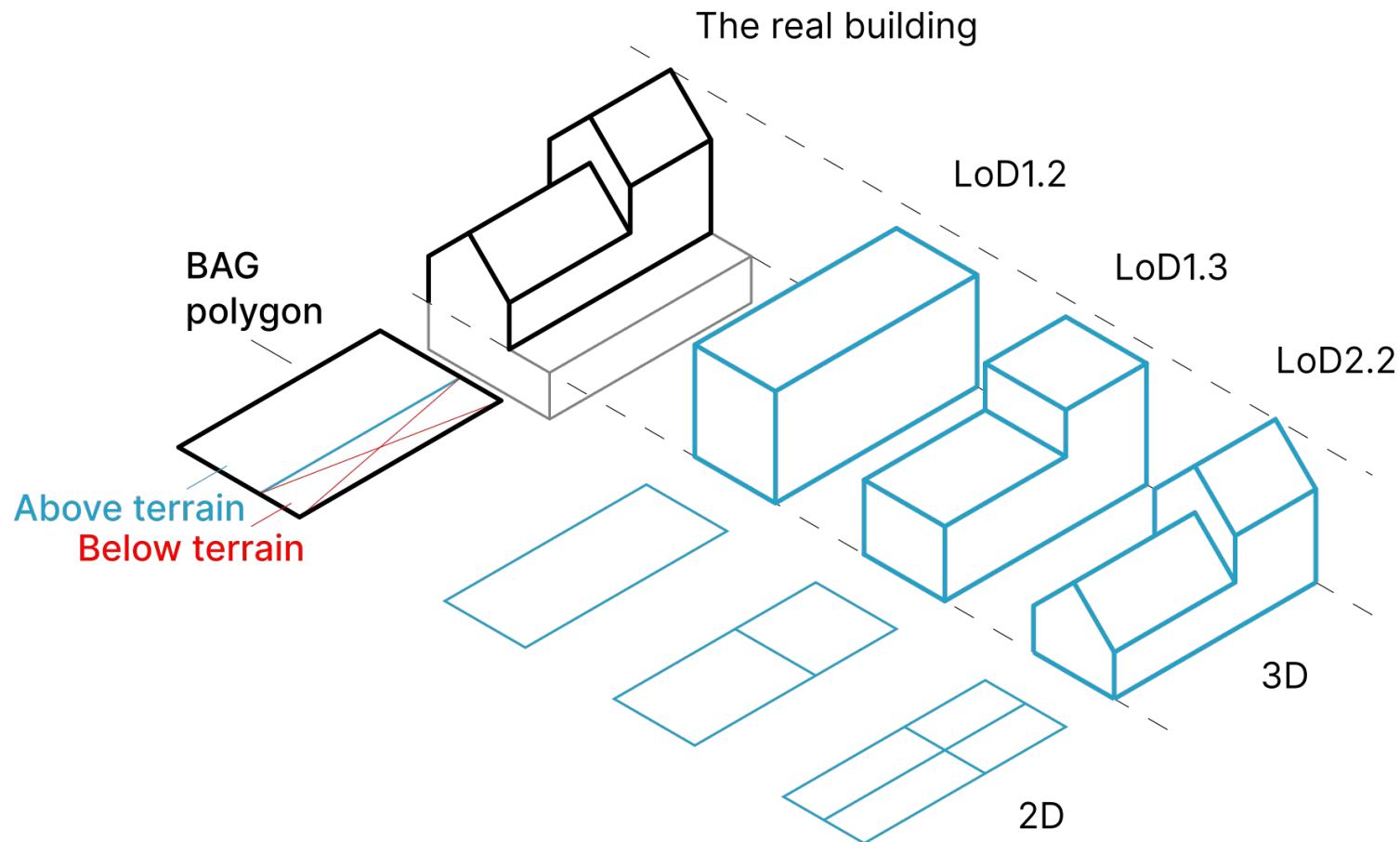
These allow you to explore the entire dataset in another software (eg. QGIS) without having to download anything beforehand.

Type	URL
WMS 	https://data.3dbag.nl/api/BAG3D_v2/wms?request=getcapabilities
WFS 	https://data.3dbag.nl/api/BAG3D_v2/wfs?request=getcapabilities

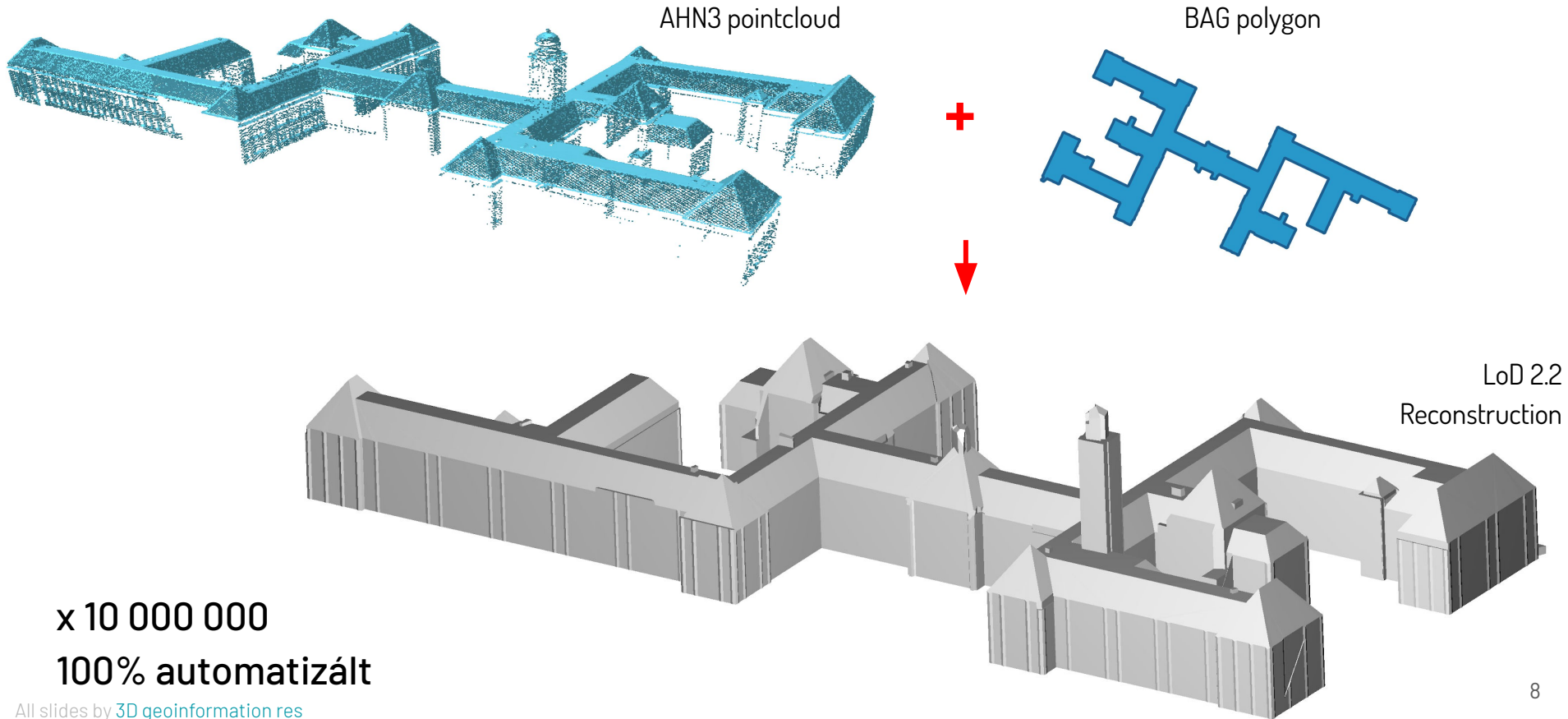
PostgreSQL data dump

The PostgreSQL file below contain the raw 3D BAG data for the whole of the Netherlands, including geometry and attributes. Beware, this is a very large file to download.

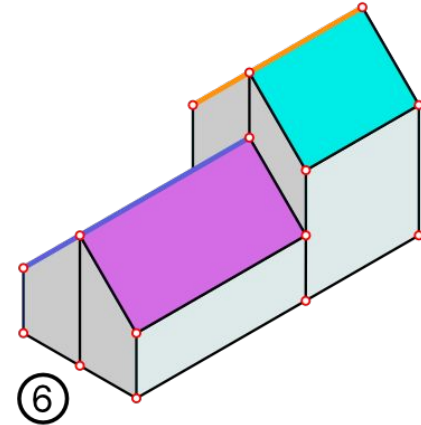
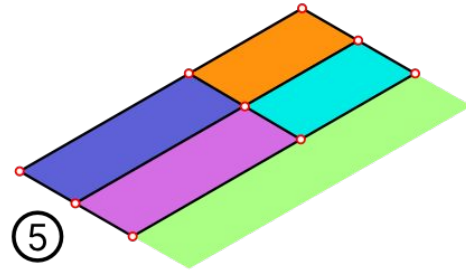
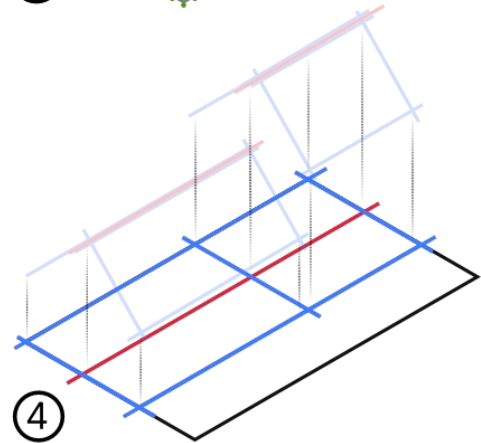
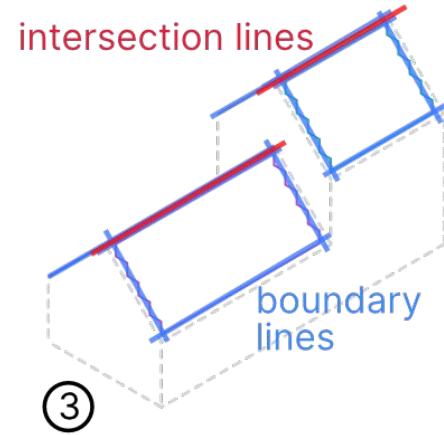
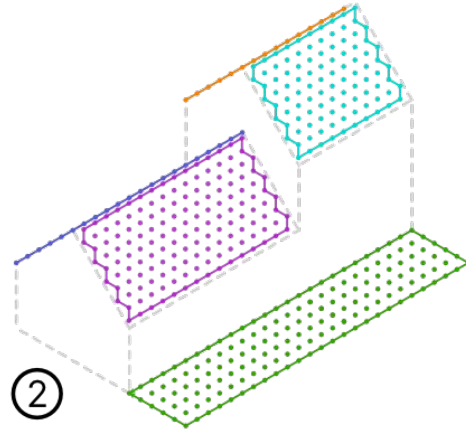
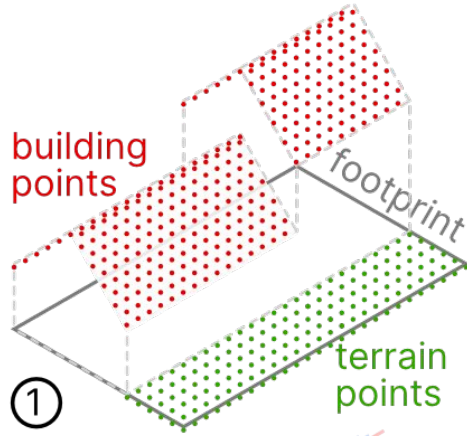
File	Format	Size	Version
3dbag_v210908_fd2cee53.zip	PostgreSQL 	>70GB	v21.09.8



Egy épület modellezése



Egy épület modellezése

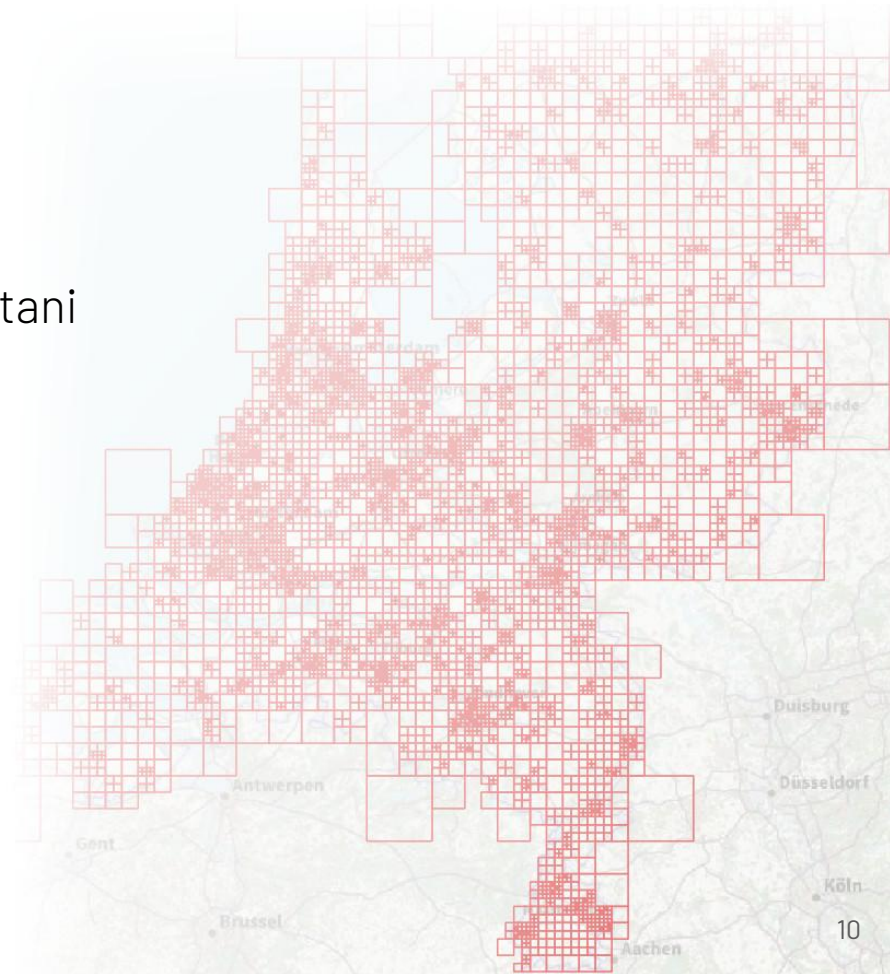


Egy ország modellezése

divide and conquer → csempéken alapul

quad-tree segít a terhelést egyenletesen szétosztani

- hasonló számú épület csempénként
- a kimenet mérete is korlátok között marad

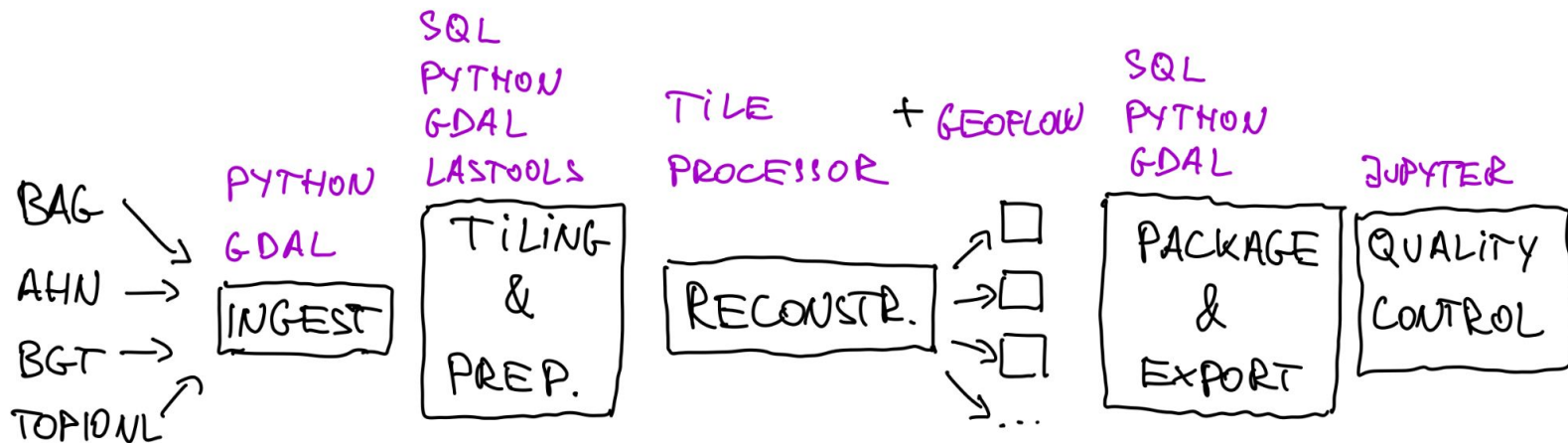


Vezénylés



<https://tenor.com/btlbz.gif>

DAGSTER



POSTGRESQL

FILESYSTEM

Dagster

 DAGSTER

0.10.7

INSTANCE

Runs

Assets

Status

workspace

bag3d_repository

Pipelines & Solids:

Search pipelines...

bag_ingest_pipeline

export_pipeline

lvbag_ingest_pipeline

reconstruction_input_pipeline

reconstruction_pipeline

tiling_pipeline

toplon_ingest_pipeline

Schedules & Sensors:

No schedules or sensors defined

Automatic (CEST)

reconstruction_pipeline

& Pipeline in bag3d_repository@bag3d_pipeline_webhook_listener

Overview

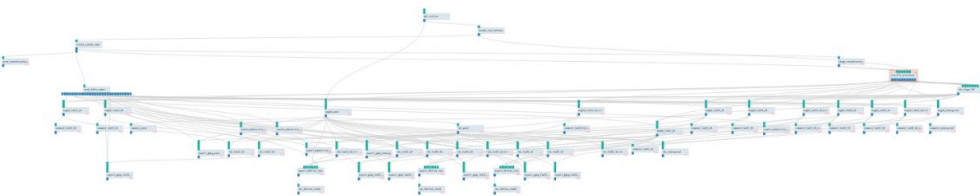
Definition

Playground

Runs

run_tile_processor

Q Highlight...



Info

Types

INVOCATION

run_tile_processor

Inputs

stage_reconstruction_schema:result

create_schema_name:stage_schema

create_run_reference:result

→ start

→ stage_schema

→ run_ref

Outputs

lod11_2d

lod11_2d

lod11_2d

lod12_2d

lod12_2d

lod12_2d

lod12_2d

lod12_3d

lod12_3d

lod12_3d_tri

lod13_2d

lod13_2d

lod13_3d

lod13_3d

lod13_3d_tri

lod22_2d

lod22_2d

lod22_3d

lod22_3d

lod22_3d_tri

→ bag3d_lod11_2d:lod11_2d

→ bag3d_pand:lod11_2d

→ idx_stage_tbl:lod11_2d

→ bag3d_lod12_2d:lod12_2d

→ bag3d_ongrond:lod12_2d

→ idx_stage_tbl:lod12_2d

→ bag3d_lod12_3d:lod12_3d

→ idx_stage_tbl:lod12_3d

→ bag3d_lod12_3d_tri:lod12_3d_tri

→ bag3d_lod13_2d:lod13_2d

→ idx_stage_tbl:lod13_2d

→ bag3d_lod13_3d:lod13_3d

→ idx_stage_tbl:lod13_3d

→ bag3d_lod13_3d_tri:lod13_3d_tri

→ bag3d_lod22_2d:lod22_2d

→ idx_stage_tbl:lod22_2d

→ bag3d_lod22_3d:lod22_3d

→ idx_stage_tbl:lod22_3d

→ bag3d_lod22_3d_tri:lod22_3d_tri

DEFINITION

Solid

run_tile_processor

(start: Nothing, tiles: [String], stage_schema: String, threads: Int, restart: Int, run_ref: String) => (lod11_2d: SqlTableIdentifier, lod12_2d: SqlTableIdentifier, lod12_3d: SqlTableIdentifier, lod12_3d_tri: SqlTableIdentifier, lod13_2d: SqlTableIdentifier, lod13_3d: SqlTableIdentifier, lod13_3d_tri: SqlTableIdentifier, lod22_2d: SqlTableIdentifier, lod22_3d: SqlTableIdentifier, lod22_3d_tri: SqlTableIdentifier)

CONFIG

/* tile_processor Controller name */

controller_key?: ControllerKeys

database: {

dbname: String

host: String

password?: String

port: Int

user: String

}

/* Do run the executable, or just print the command that is passed to it */

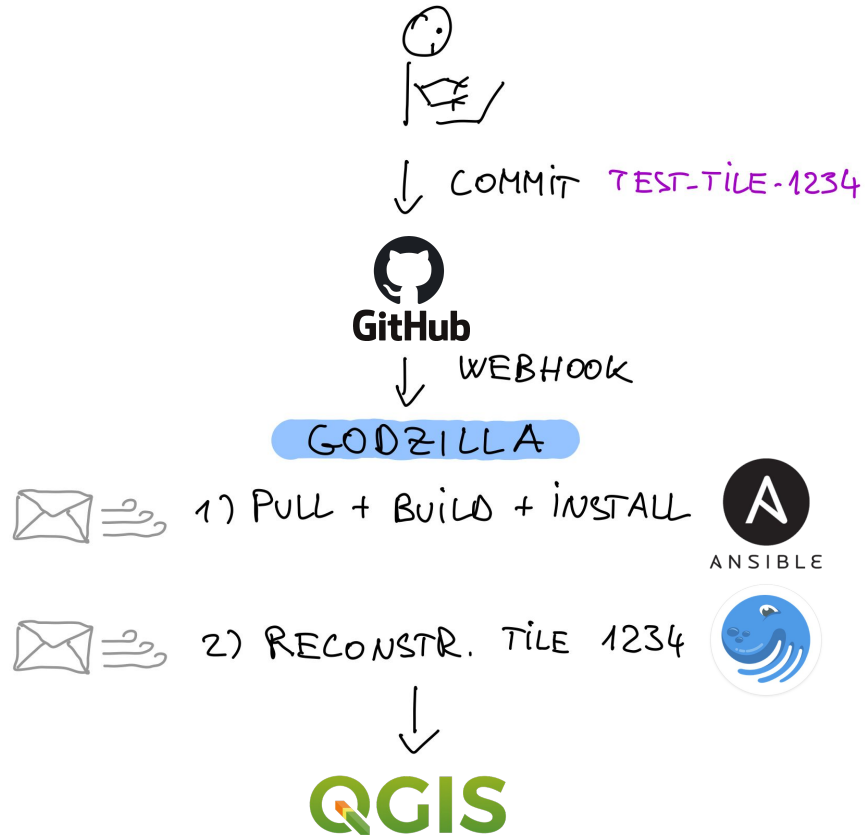
doexec?: Bool

elevation: {

directories: [{ }

}

Folyamatos integráció



<https://tenor.com/bviVvk.gif>

Minőség?

3D geometric validity > 98% 💪

most common: shell not closed,
ring self intersection,
non-manifold

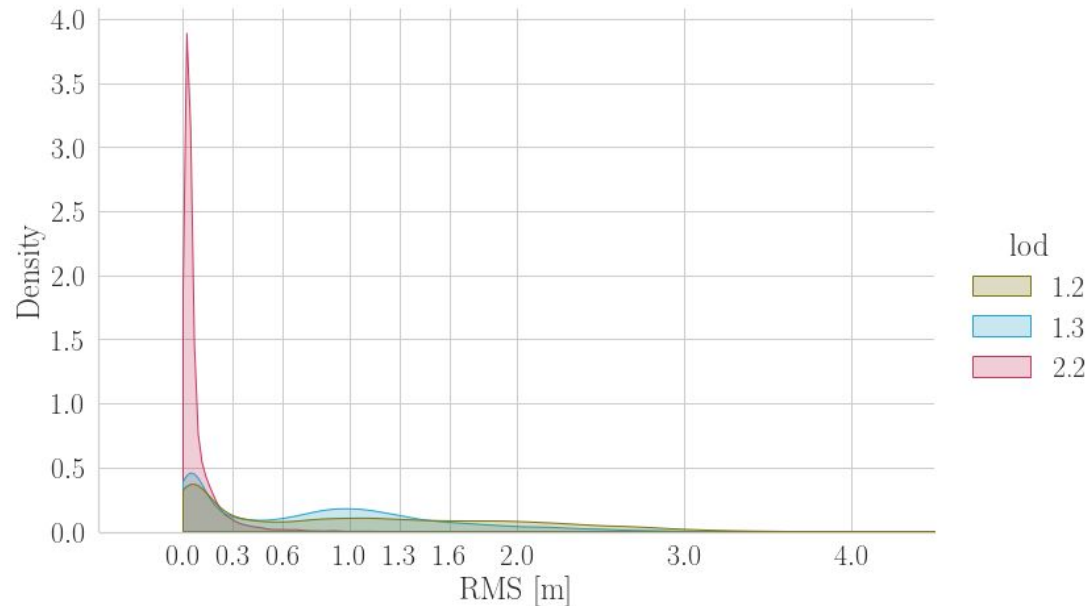
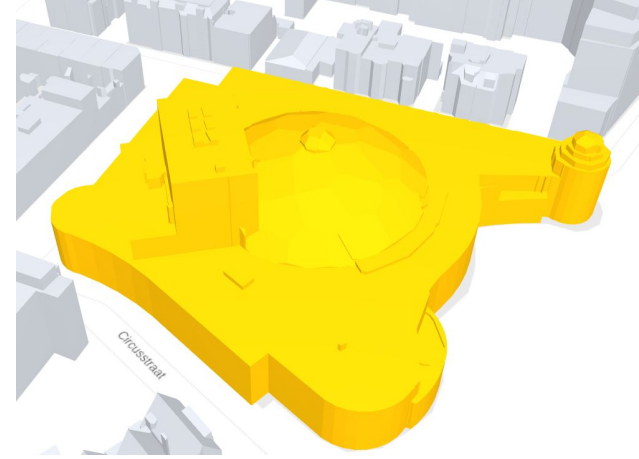
<https://val3dity.readthedocs.io>

Median RMSE for LoD2.2 < 5cm 💪

(but check the mean and std. 🤪)

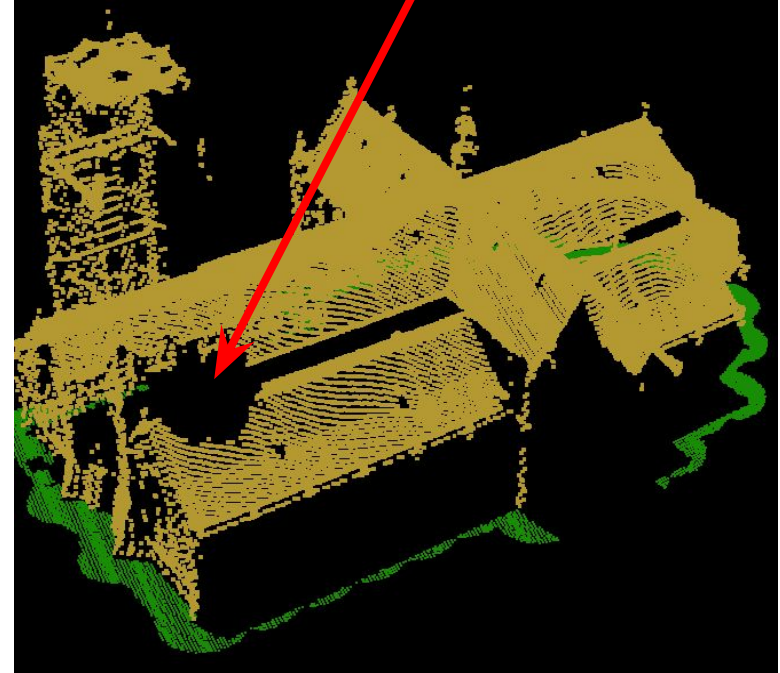
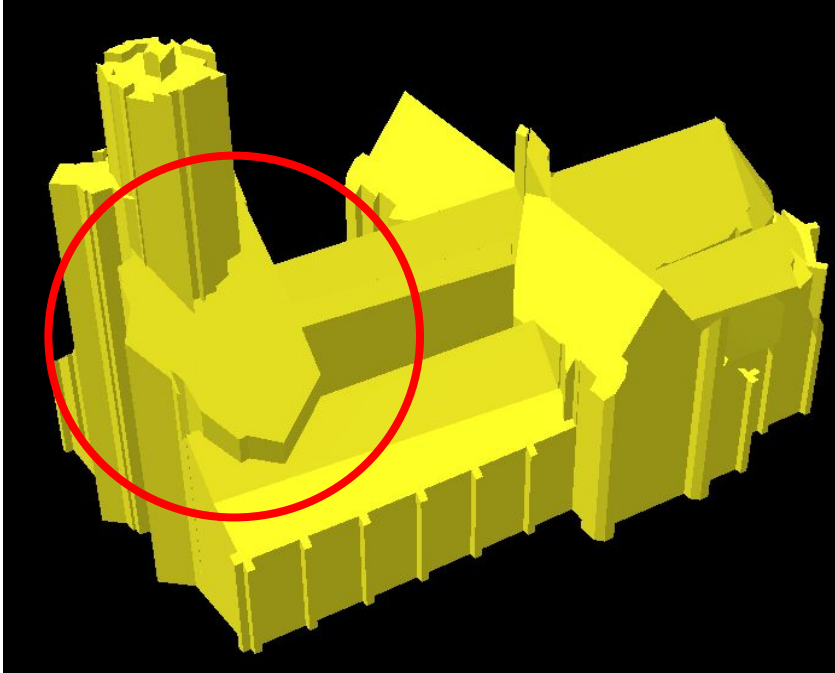
Almost complete set 💪

(failed 2.4%, in total missing 7.7% 🤪)



Minőség – bemenetfüggő

Occlusion in point cloud data



Visszajelzések...

- úrlapok
- nagyon pozitív fogadtatás
- lelkes emberek, a GIS-világon kívül is (Reddit, Tweakers etc.)
- széleskörű felhasználás

Nice and responsive on my phone over 4G! What engine is in the bottom?

Trying out the **#3DBAG** dataset by the **#TUDelft** on some wind modelling of our **#RHDHV** Rotterdam office. It works great!
It also nicely shows the winddanger spot between the buildings at the bottom.

Wonderful milestone for the Netherlands! Not only the 3d BAG, but also the self-developed 3d viewer works intuitively and super fast on PC and mobile.

[See original](#) · 🌐

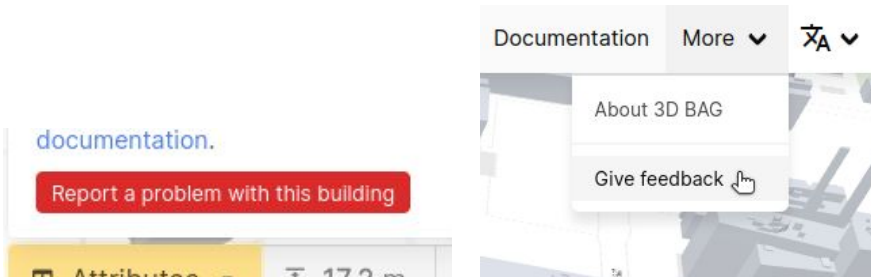
And runs under Citrix 😊 Beautiful work TU-Delft!

[See original](#) · 🌐

Thank you very much for your efforts and dedication! 🙏🇳🇱

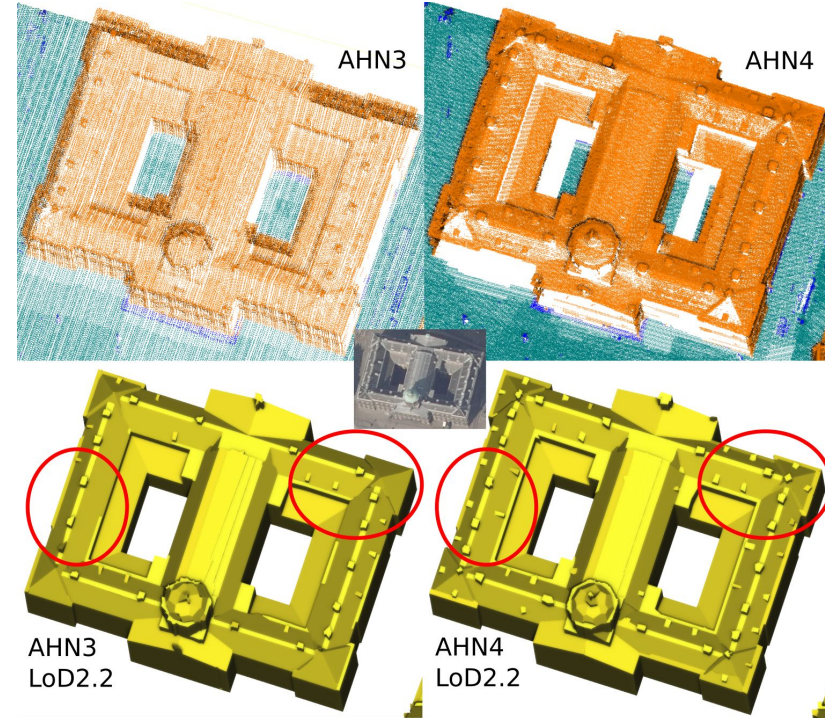
3D BAG a médiában:

<https://docs.3dbag.nl/en/overview/media/>



Következő lépések?

- Tervek:
 - egyéb, aktuálisabb pontfelhők integrálása
 - infrastruktúra optimalizálása
 - minőségellenőrzés finomítása
 - egyéb országok?
 - stb...
- Stabil verzió 2022-ben
- Hogyan tudjuk nyílt adatokként fenntartani hosszútávon is?



Köszönöm a figyelmet!

3dbag.nl

Dukai Balázs

twitter: [@balazsducai](#) [@tudelft3d](#) email: b.dukai@tudelft.nl



This project has received funding from the European Research Council (ERC) under the European Unions Horizon2020 Research & Innovation Programme (grant agreement no. 677312 UMnD: Urban modelling in higher dimensions).

The technology behind the 3D BAG service was developed by the 3D Geoinformation research group, Department of Urbanism at the Delft University of Technology. This has been done in various research projects. Funding has been received from the European Commission (ERC), the Netherlands Organization for Scientific Research (NWO), and the Amsterdam Institute of Advanced Metropolitan Solutions (AMS). The algorithms have been further improved in collaborations with partners such as RIVM, Rijkswaterstaat and Kadaster.