

Brief overview of (some) tools to work with CityGML

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Software tools

- Data modelling
- Viewers
- CityGML/CityJSON generators
- Parsers
- Validators
- Databases

Data modelling

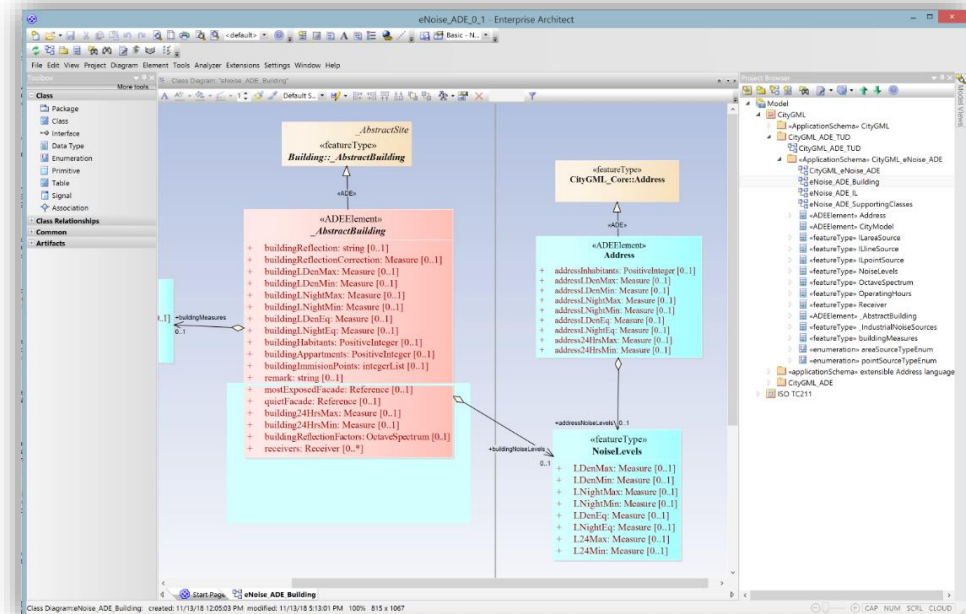
Data modelling

Enterprise Architect (UML modelling)

- Commercial UML modelling tool
- Windows only
- Class diagrams, Sequence diagrams, use case modelling, etc.
- Useful for creating CityGML ADEs
- <https://sparxsystems.com/products/ea/>

UML & XSD tools

- EA
- ShapeChange



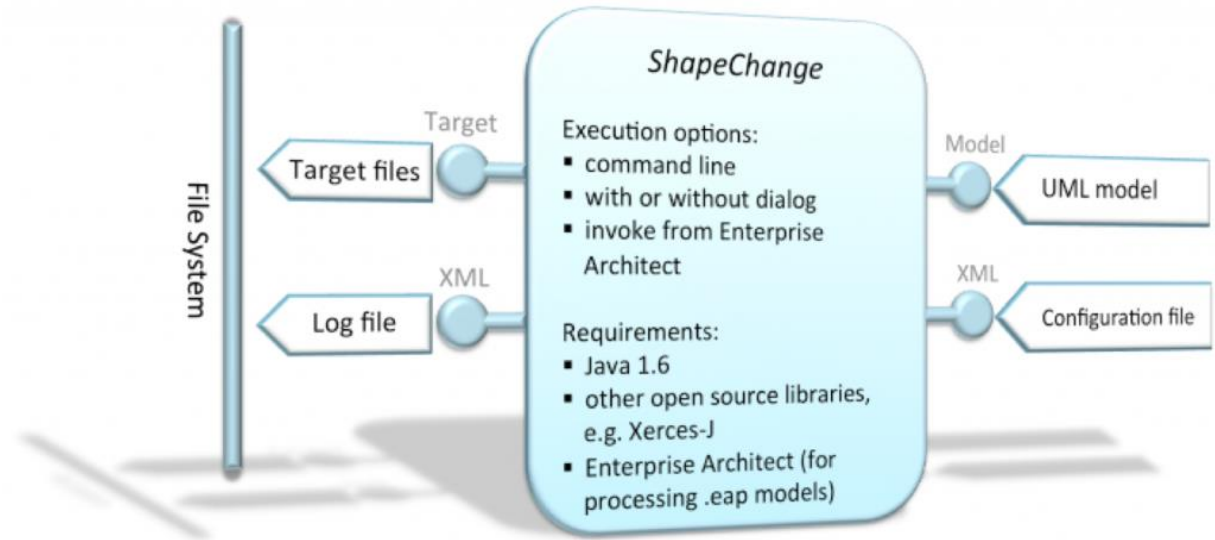
Data modelling

ShapeChange (UML to XSD)

- Open-source software to generate GML application schema (like CityGML) from UML models
- JAVA based
- <https://shapechange.net>

UML & XSD tools

- EA
- ShapeChange



Viewers

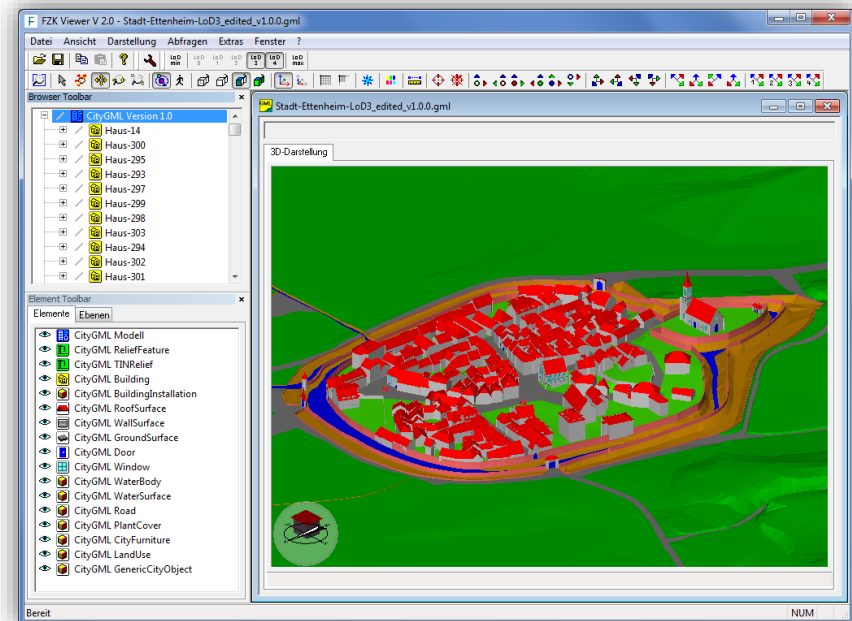
Viewers

FZK Viewer

- By Karlsruhe Institute of Technology (KIT)
- Freeware & Windows only
- Visualizes CityGML, IFC & gbXML
- Opens and visualizes also CityGML ADE datasets
- <https://www.iai.kit.edu/1302.php>

Viewers

- FZK
- Azul
- FME
- CityJSON Viewer



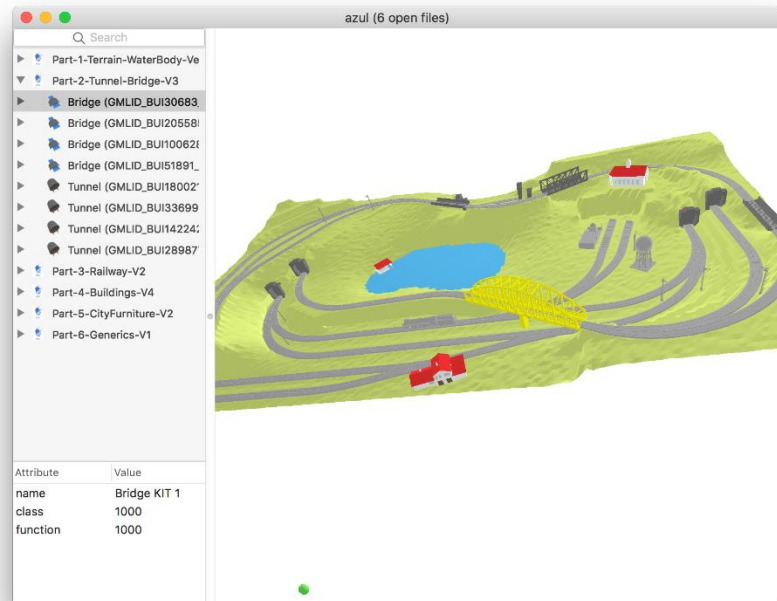
Viewers

Azul

- By 3D Geoinformation, TU Delft
- Open source & MacOS only
- Visualize CityGML & CityJSON
- <https://itunes.apple.com/nl/app/azul/id1173239678?mt=12>

Viewers

- FZK
- Azul
- FME
- CityJSON Viewer



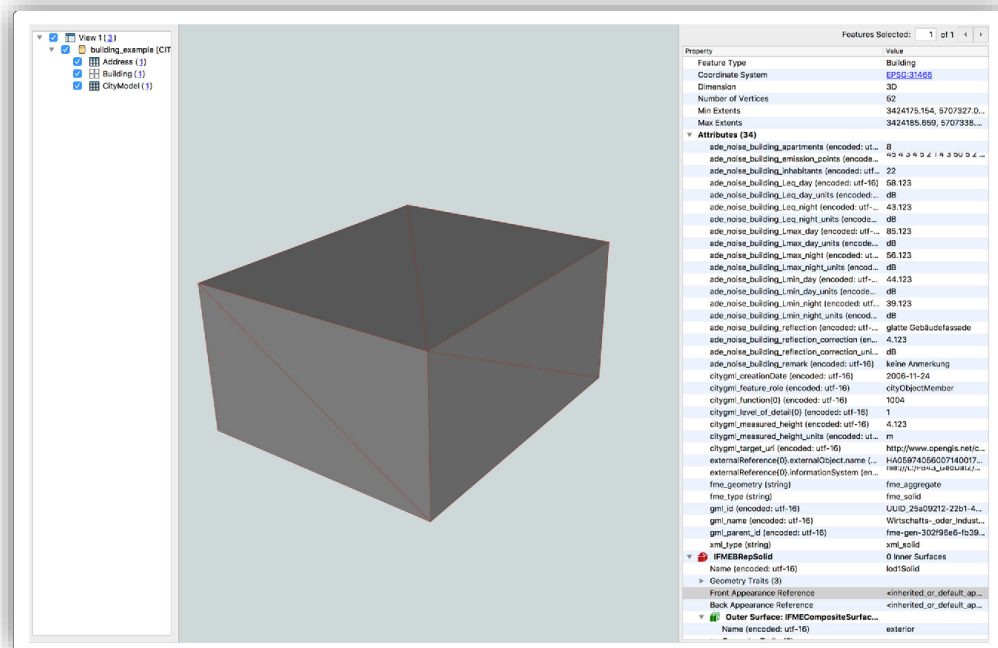
Viewers

FME Data Inspector

- By Safe Software
- Commercial & works on MacOS, Windows, etc.
- Visualizes CityGML, OBJ, COLLADA, etc.

Viewers

- FZK
- Azul
- FME
- CityJSON Viewer



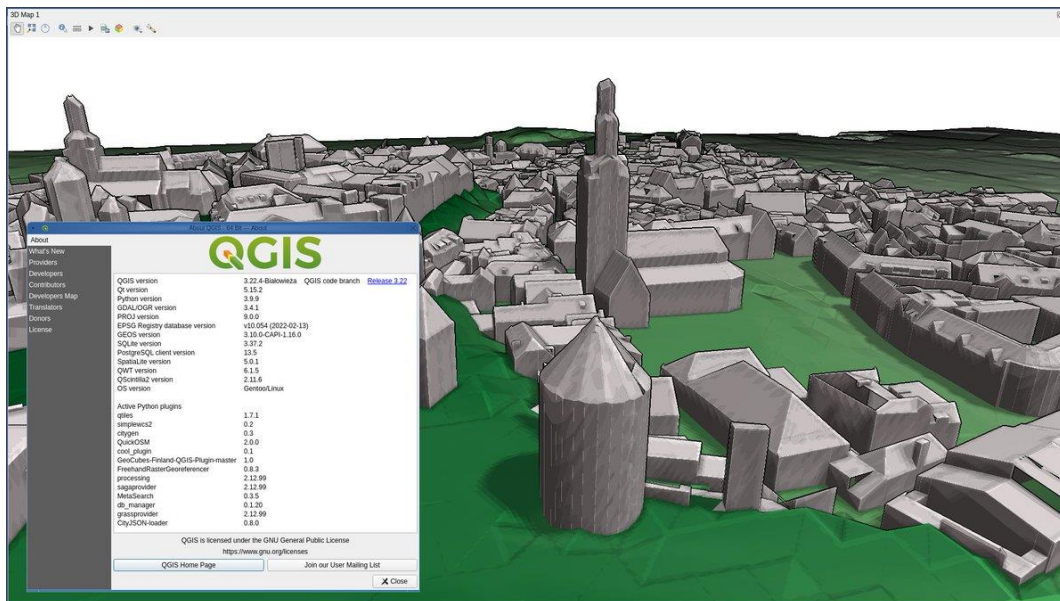
Viewers

CityJSON Loader

- Python-based plugin for QGIS
- Free and open source
- <https://plugins.qgis.org/plugins/CityJSON-loader>
- <https://github.com/cityjson/cityjson-qgis-plugin>

Viewers

- FZK
- Azul
- FME
- CityJSON Loader



Dataset generators

Generators

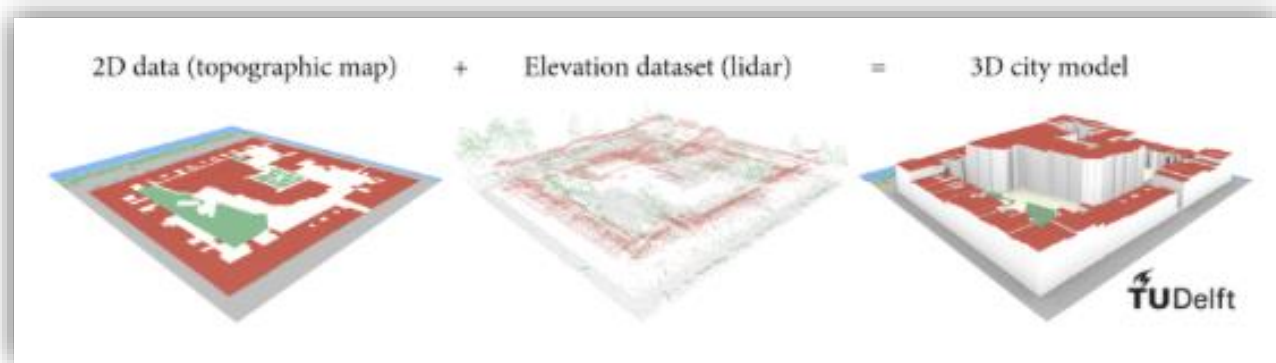
3dfier

- By 3D Geoinformation, TU Delft
- Open source & works on MacOS & Windows, etc.
- Generates CityGML, OBJ, CityJSON
- <https://github.com/tudelft3d/3dfier>



Generators

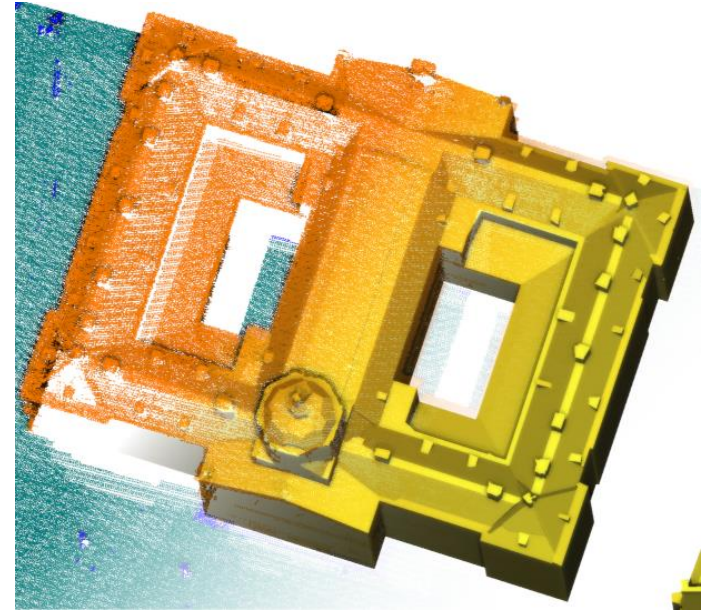
- 3dfier
- geoflow
- CityEditor
- FME



Generators

geoflow-bundle

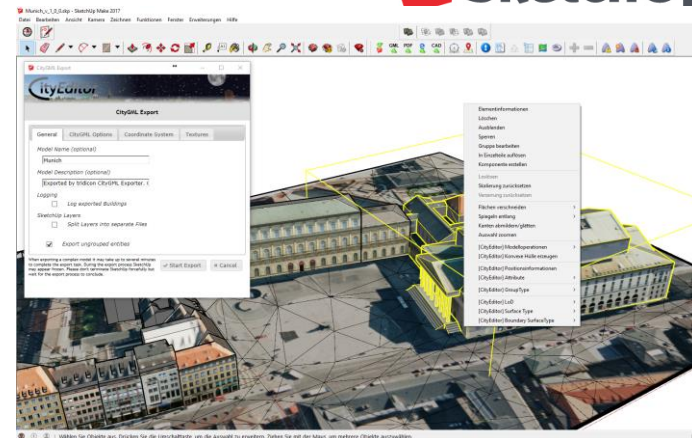
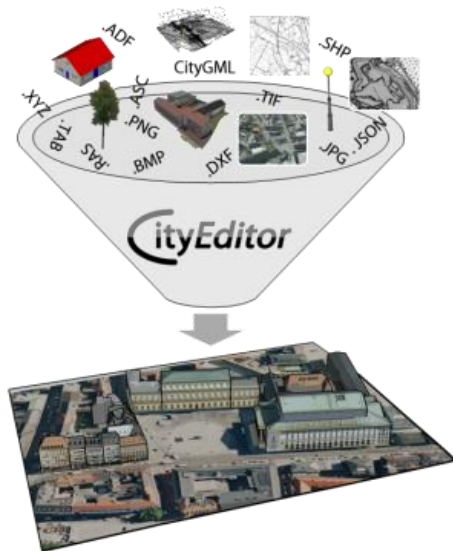
- By 3DGI, a spin-off of 3D Geoinformation group at TU Delft
- Building modelling from footprint and 3D point cloud.
- Open source & works on Linux
- Generates CityJSON, OBJ, GeoPackage, PostGIS
- <https://github.com/geoflow3d/geoflow-bundle>



Generators

CityEditor

- SketchUp plugin by 3Dis GmbH
- Commercial & Windows only
- Import, edit & export CityGML models
- Import point clouds & terrain models
- <https://www.3dis.de/cityeditor/>



(Src: <https://www.3dis.de/produkte-und-dienstleistungen/>)

Generators

- 3dfier
- geoflow
- **CityEditor**
- FME

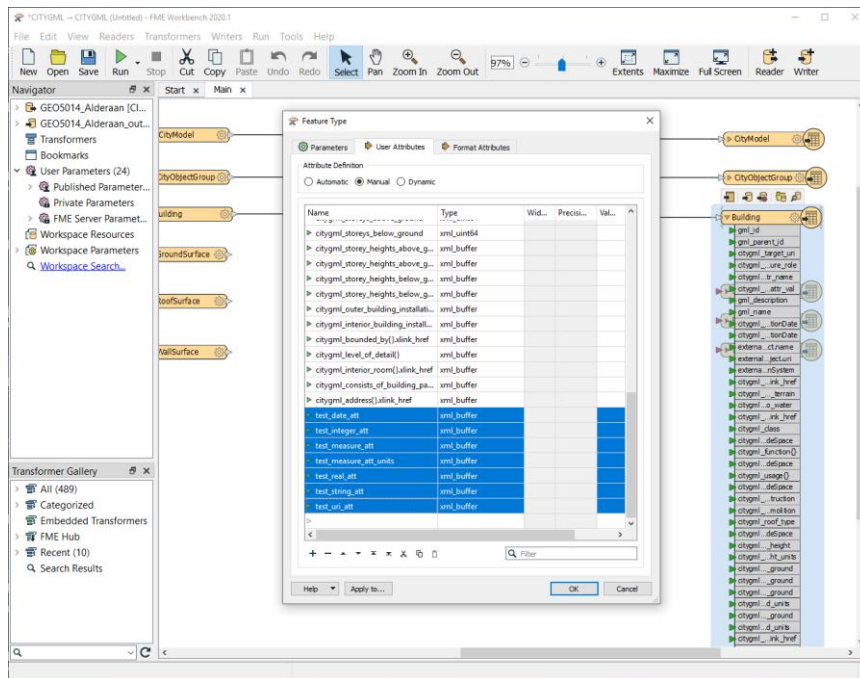
Generators

FME Workbench

- Can read and write CityGML data
- Can read and write CityJSON data (currently with some limitations)
- Support for ADEs
- Commercial

Generators

- 3dfier
- geoflow
- CityEditor
- FME



CityGML/CityJSON parsers

Parsers

citygml4j

- Open-source JAVA library
- Reads, processes and writes CityGML datasets
- Supports CityJSON
- <https://github.com/citygml4j/citygml4j>

Cjio (CityJSON/io)

- Open-source Python library
- Reads, processes and writes CityJSON datasets
- Supports CityJSON
- <https://github.com/cityjson/cjio>

Parsers

- citygml4j
- CityJSON/io
- Etc.

Parsers

- citygml4j
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Parsers and API for programmers

citygml4j

Open source Java class library and API

CodeSynthesis XSD

XML Schema to C++ data binding compiler, see [the CityGML specificities](#)

FME

Can be used to read, write, process and visualise CityGML; Windows, macOS, Linux

HUMBOLDT Alignment Editor (HALE)

Can read, write, process CityGML and other GML application schemas (incl. INSPIRE)

libcitygml

Open source C++ class library for reading CityGML. Supports most CityGML elements; also provides a plugin for the OpenSceneGraph library for CityGML visualization

ogc-schemas

Provides JAXB (Java) and Jsonix (JSON) bindings for XML Schemas defined by OGC incl; CityGML v1.0 and v2.0

OGR

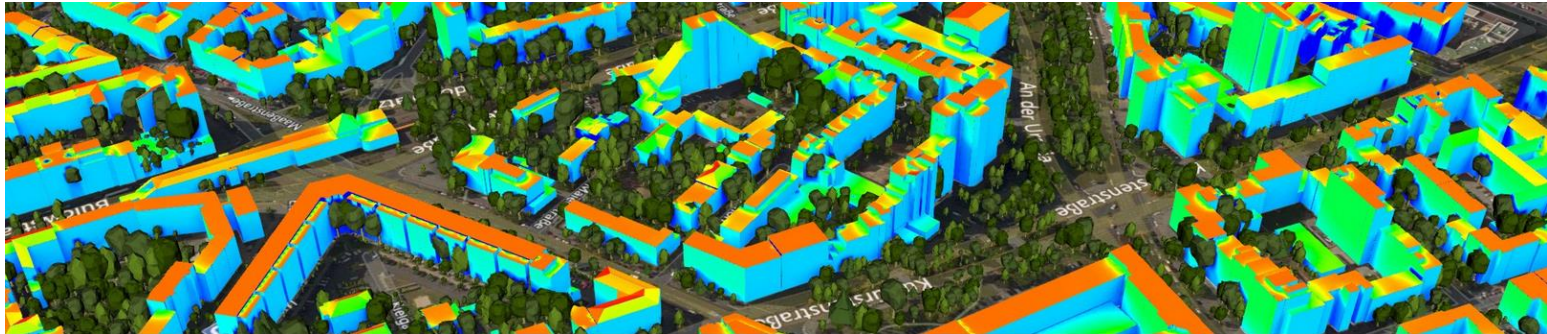
Could help in reading 'vanilla' GML, not support for CityGML objects though

Database management

DBMS

3DCityDB

- Geo-database schema to store, represent, and manage virtual 3D city models on top of a standard spatial relational DBMS (PostgreSQL/PostGIS & Oracle)
- Comes with a JAVA-based Importer/Exporter
- Works with CityGML/CityJSON files, exports to gITF, KML/COLLADA files, too
- Open source & cross-platform
- <https://www.3dcitydb.org>
- <https://github.com/3dcitydb>



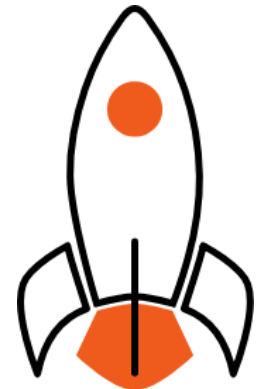
DBMS

GeoRocket

- By Fraunhofer IGD
- High performance data store for CityGML, GeoJSON & any other GML files
- Open source (& a Pro edition)
- <https://georocket.io>

DBMS

- 3DCityDB
- **GeoRocket**



Web visualisation

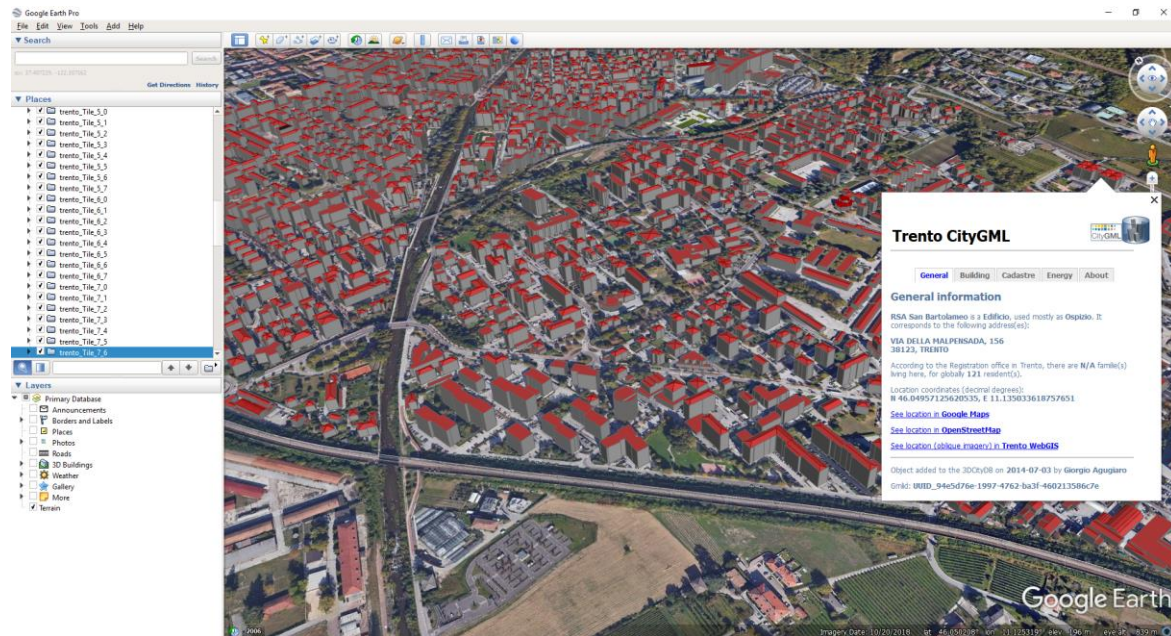
Web visualization

Google Earth Pro

- Freeware, closed source
- Can visualize CityGML data exported as kml/kmz

Web visualization

- Google Earth Pro
- CesiumJS



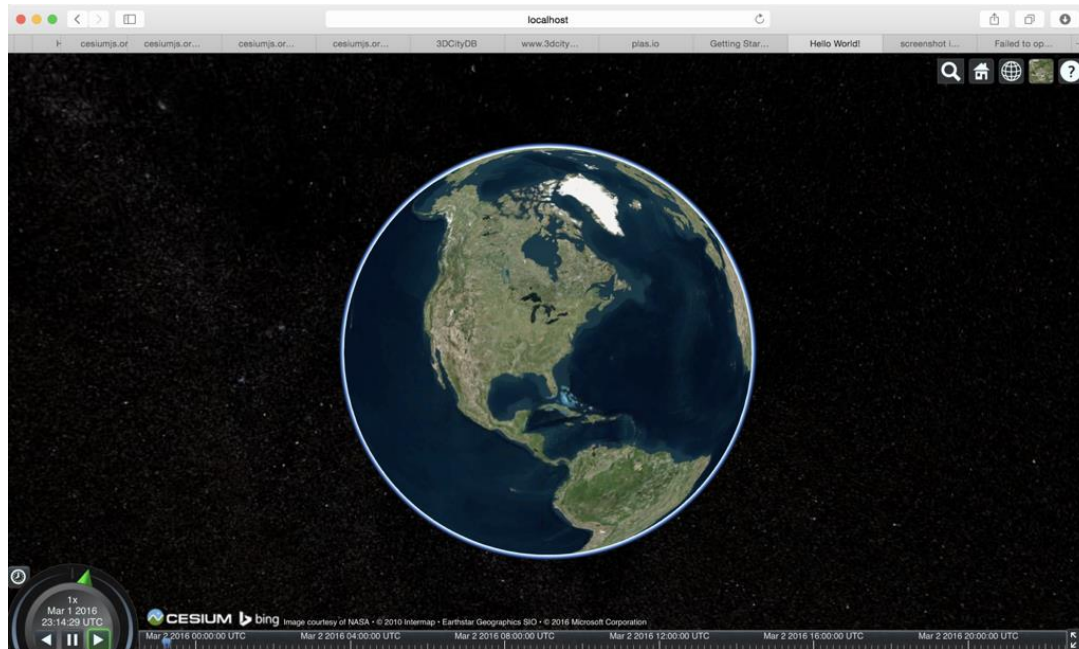
Web visualization

CesiumJS

- Open-source JS library to create 3D globes in the web browser
- No plugin dependency
- Built using web standards: HTML5 & WebGL
- Runs almost everywhere...
- <https://cesiumjs.org>

Web visualization

- Google Earth Pro
- CesiumJS



Thank you for your attention!



Dr. Giorgio Agugiaro

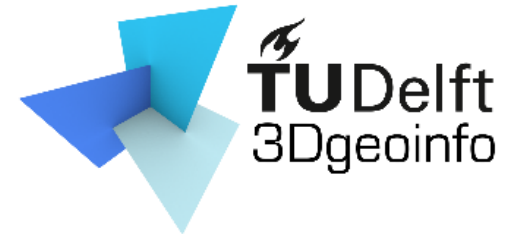
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Acknowledgements:

Kavisha Kumar