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Bitmanagement Software GmbH

Interactive Web3D Software

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Bitmanagement Software, Germany
Board of directors Web3D Consortium, USA

www.bitmanagement.com

2D → 3D → X3D



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Robust ISO 3D Client Software – Realtime rendering

2D → 3D → X3D

INTERACTIVE
INTERNET READY
ISO STANDARD

The Rich Media Strategy

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CityGML Implementation

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2D 3D X3D



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Transcoding of CityGML Info Possible in BS Contact GEO, e.g. to ISO Standard X3D



```

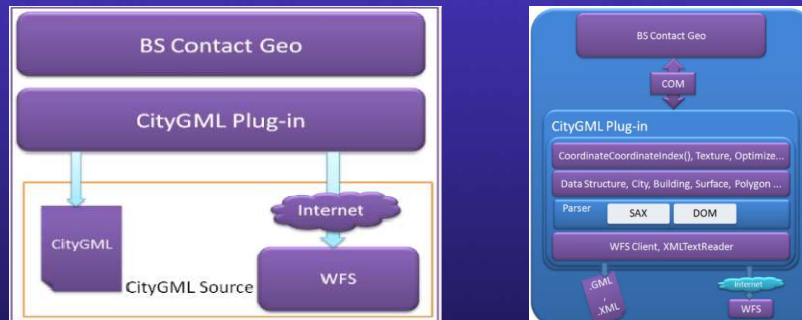
graph TD
    VMRL[VMRL] --> SaveWorld
    X3D[X3D] --> SaveWorld
    SaveWorld[SaveWorld() / BS Contact Geo] --> CityGML[CityGML Plug-In]
    CityGML --> GMLXML[.GML / .XML]
    CityGML -- Internet --> WFS[WFS]
  
```

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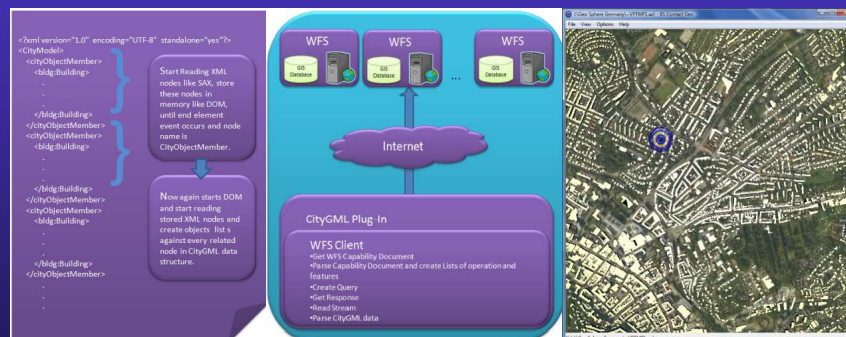
2D 3D X3D



Reading native CityGML Streams - online and offline



Parcing of large CityGML data

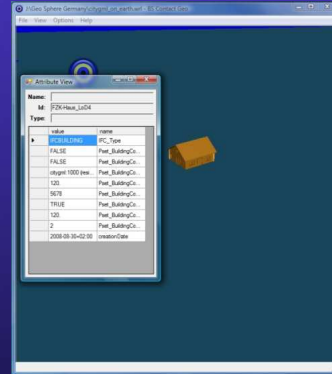
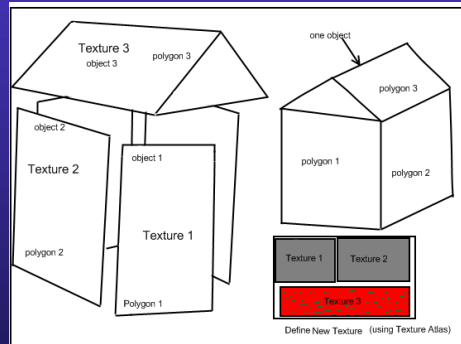




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Fast Rendering Optimization for CityGML: Combining Textures in one texture atlas keeping Metainformation and attributes



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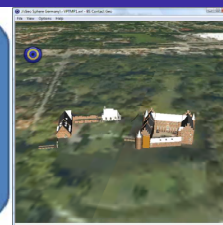
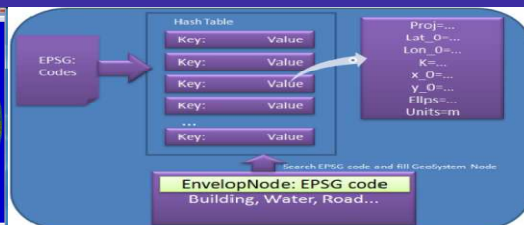
2D = 3D = X3D



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Automated coordinate Transform and positioning on 3D Globe using EPSG Codes



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2D = 3D = X3D



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3D Performance Test for CityGML

Test Computer 1

- . Intel Core 2 Qaud.
- . Processor 2.33GHz.
- . RAM 4GB.
- . Operating System Windows
Vista Home Premium SP1.

Test Computer 2

- . AMD Turion 64 Mobile.
- . Processor 1.79GHz.
- . RAM 1GB.
- . Operating system Windows XP
Home Edition SP2.

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2D - 3D - X3D



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3D Performance Test for CityGML

| CityGML File name & size | LandXplorer | Aristoteles | BSContactGeo |
|------------------------------------|-------------|-------------|--------------|
| Berlin_alexanderplatz_35.2MB | 00.00.35 | 00.00.08 | 00.00.04.74 |
| LoD2-10x10-BoundedBy 326KB | 00.00.02 | 00.00.01 | 00.00.00.46 |
| LoD2-10x10-MultiSurface 210KB | 00.00.03 | 00.00.01 | 00.00.00.40 |
| LoD2-10x10-solid 215KB | 00.00.03 | 00.00.01 | 00.00.00.45 |
| LoD2-20x20-BoundedBy 1.28MB | 00.00.03 | 00.00.02 | 00.00.00.90 |
| LoD2-20x20-MultiSurface 858KB | 00.00.03 | 00.00.01 | 00.00.00.75 |
| LoD2-20x20-solid 876KB | 00.00.03 | 00.00.03 | 00.00.00.75 |
| Testcases-100x50 11.3MB | 00.00.26 | 00.00.12 | 00.00.07.14 |
| Testcases-100x70 13.2MB | 00.00.32 | 00.00.20 | 00.00.08.17 |
| Testcases-100x80 15.1MB | 00.00.35 | 00.00.18 | 00.00.09.19 |
| Testcases-100x90 17MB | 00.00.37 | 00.00.18 | 00.00.10.47 |
| Testcases-100x100a 18.9MB | 00.00.45 | 00.00.18 | 00.00.11.57 |
| FZK_Haus_LOD1 9KB | 00.00.02 | 00.00.01 | 00.00.00.30 |
| FZK_Haus_LOD2 56KB | 00.00.02 | 00.00.04 | 00.00.00.33 |
| FZK_Haus_LOD3 5.67MB | 00.00.07 | 00.00.03 | 00.00.01.13 |
| FZK_Haus_LOD4BS 9.95MB | 00.00.04 | 00.00.18 | 00.00.01.90 |
| FZK_Haus_LOD4S 9.80MB | 00.00.04 | 00.00.18 | 00.00.01.75 |
| Stadt-Ettenheim-LoD3.v1.0.0 48.7MB | 00.00.50 | 00.00.16 | 00.00.06.49 |
| Gebaudemodell_LOD1_450634 26.8MB | 00.00.50 | 00.00.12 | 00.00.08.56 |
| Gebaudemodell_LOD1_461012 50Mb | 00.01.12 | 00.00.20 | 00.00.13.90 |
| LoD2-50x50-BoundedBy 8.11Mb | | 00.00.06 | 00.00.04.02 |
| LoD2-50x50-MultiSurface 5.29MB | | 00.00.01 | 00.00.03.25 |
| LoD2-50x50-solid 5.40MB | | 00.00.03 | 00.00.03.27 |
| LoD2-100x100-BoundedBy 32.5MB | | 00.01.06 | 00.00.15.43 |
| LoD2-100x100-MultiSurface 21.2MB | | 00.00.20 | 00.00.12.20 |
| LoD2-100x100-solid 21.7MB | | 00.00.18 | 00.00.12.52 |

| CityGML File name & size | LandXplorer | Aristoteles | BSContactGeo |
|------------------------------------|-------------|-------------|--------------|
| Berlin_alexanderplatz_35.2MB | 00.00.57 | 00.00.18 | 00.00.07.78 |
| LoD2-10x10-BoundedBy 326KB | 00.00.03 | 00.00.03 | 00.00.00.85 |
| LoD2-10x10-MultiSurface 210KB | 00.00.02 | 00.00.02 | 00.00.00.53 |
| LoD2-10x10-solid 215KB | 00.00.02 | 00.00.02 | 00.00.00.53 |
| LoD2-20x20-BoundedBy 1.28MB | 00.00.03 | 00.00.02 | 00.00.01.22 |
| LoD2-20x20-MultiSurface 858KB | 00.00.03 | 00.00.01 | 00.00.01.12 |
| LoD2-20x20-solid 876KB | 00.00.03 | 00.00.03 | 00.00.01.28 |
| Testcases-100x50 11.3MB | 00.00.46 | 00.00.16 | 00.00.11.20 |
| Testcases-100x70 13.2MB | 00.01.40 | 00.00.22 | 00.00.13.08 |
| Testcases-100x80 15.1MB | 00.01.45 | 00.00.30 | 00.00.15.15 |
| Testcases-100x90 17MB | 00.02.07 | 00.01.38 | 00.00.17.26 |
| Testcases-100x100a 18.9MB | 00.01.24 | 00.00.40 | 00.00.19.46 |
| FZK_Haus_LOD1 9KB | 00.00.06 | 00.00.03 | 00.00.00.34 |
| FZK_Haus_LOD2 56KB | 00.00.02 | 00.00.02 | 00.00.00.62 |
| FZK_Haus_LOD3 5.67MB | 00.00.12 | 00.00.04 | 00.00.02.00 |
| FZK_Haus_LOD4BS 9.95MB | 00.00.22 | 00.00.05 | 00.00.03.26 |
| FZK_Haus_LOD4S 9.80MB | 00.00.25 | 00.00.06 | 00.00.03.15 |
| Stadt-Ettenheim-LoD3.v1.0.0 48.7MB | 00.01.20 | 00.00.23 | 00.00.12.18 |
| Gebaudemodell_LOD1_450634 26.8MB | 00.01.45 | 00.00.25 | 00.00.14.54 |
| Gebaudemodell_LOD1_461012 50Mb | 00.01.50 | 00.01.05 | 00.00.24.04 |
| LoD2-50x50-BoundedBy 8.11Mb | | 00.00.53 | 00.00.06.65 |
| LoD2-50x50-MultiSurface 5.29MB | | 00.00.08 | 00.00.05.20 |
| LoD2-50x50-solid 5.40MB | | 00.00.08 | 00.00.05.09 |
| LoD2-100x100-BoundedBy 32.5MB | | 00.02.06 | 00.00.26.04 |
| LoD2-100x100-MultiSurface 21.2MB | | 00.00.35 | 00.00.20.83 |
| LoD2-100x100-solid 21.7MB | | 00.00.30 | 00.00.20.93 |

Test Computer 1

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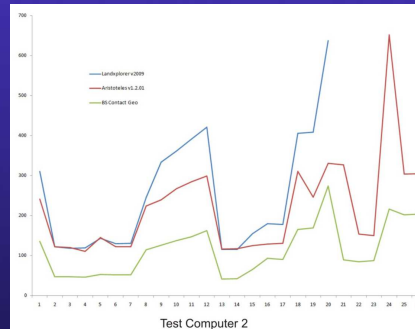
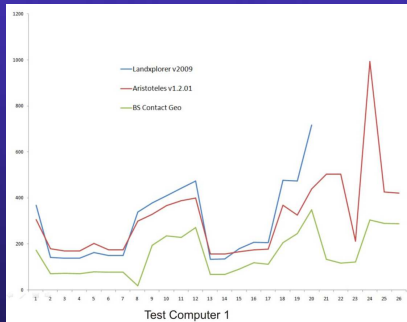
Test Computer 2



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Memory Usage Test for CityGML



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2D = 3D = X3D



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Create Stunning Real-time 3D Applications From Your Existing Data

| Your Digital Data | BS Workflow Tools | BS Viewers | Your Application |
|--|--|---|---|
| Import Existing Assets <ul style="list-style-type: none">• 3D objects• Virtual worlds• Audio• Video• Pictures• GIS data• CAD data• Satellite imagery Authoring Tool Support <ul style="list-style-type: none">• 3ds max• Blender• GIS tools• CAD tools Technology Integration <ul style="list-style-type: none">• Databases• Client / server• International standards | BS SDK Package Application development BS Editor Content authoring BS Collaborate Multi-user worlds BS Exporters 3ds max and blender BS Encrypt Data encoding / security BS Reducer Polygon reduction | BS Contact VRML/X3D Real-time 3D player BS Contact Web player for COLLADA BS Contact Stereo Stereoscopic visualization BS Contact Geo Geographic visualization BS Contact Mobile 3D on handheld devices BS Contact J Compact java applet | Interactive Products on DVD <ul style="list-style-type: none">• Bertelsmann globe project• Consumer product Community Web Concept <ul style="list-style-type: none">• HSV soccer club• Social networking Online Applications and Intranets <ul style="list-style-type: none">• Integrated Virtual Network III, Inc.• Communication in 3D ISO Standard Projects on PCs <ul style="list-style-type: none">• Metaio GmbH• Augmented reality Stereoscopic Visualization <ul style="list-style-type: none">• Spatial View, Inc.• Autostereoscopic displays |



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2D = 3D = X3D

BS Contact Geo (2).Ink

2D → 3D → ~~X3D~~

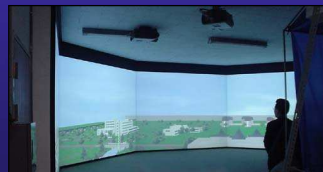
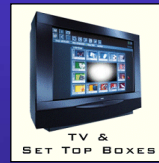
2D → 3D → ~~X3D~~



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Hardware Independent



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Visualization Outdoors and Indoors



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Bitmanagement Customers

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Bertelsmann – 3D Earth

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2D = 3D = X3D



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Interactive 3D PoIs - HSV Soccer Arena









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2D = 3D = 



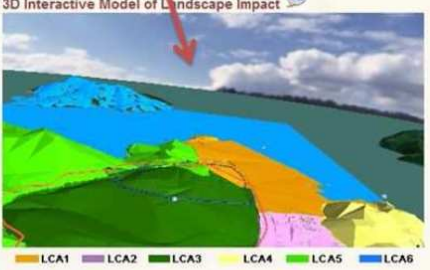
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Integrierter BS-Contact Viewer

2D Kartendarstellung

3D Interactive Model of Landscape Impact



■ LCA1
 ■ LCA2
 ■ LCA3
 ■ LCA4
 ■ LCA5
 ■ LCA6

— LANDFILL EXTENSION ON WASTE BOUNDARY
 — EXISTING LANDFILL BOUNDARY

Click and hold the left mouse button to drag to any directions on the screen.
 The 3D model on this page shows the location of SENT Landfill Extension. Viewers can use pre-defined views or interactively examine the model.

Viewpoint (click on the map)

(Click the symbol on the 3D model to view details)
[Back to Assessment Results](#)

Layers

☐ Landscape Resource Plan
☒ Landscape Character Area
☐ Assessment Results
☐ Impact Significance at LRA (Construction Phase)
☐ Impact Significance at LRA (Operation/Restoration Phase)

Navigation

Click [here](#) to reset the screen.

Auswahllayer

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2D und 3D für Tourismus Anwendungen



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Visualisierung einer römischen Stadt



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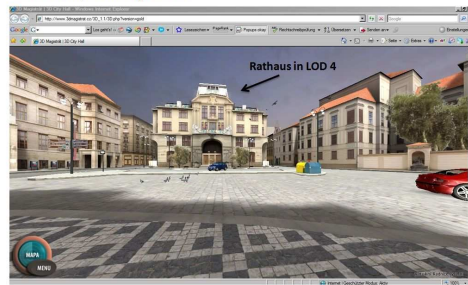


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3 Stadtmodell und LOD 4 Visualisierung

Stadtmodell (Ausschnitt) in LOD 3



Empfangsbereich Rathaus im LOD 4 Modell mit Interaktion



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2D = 3D =

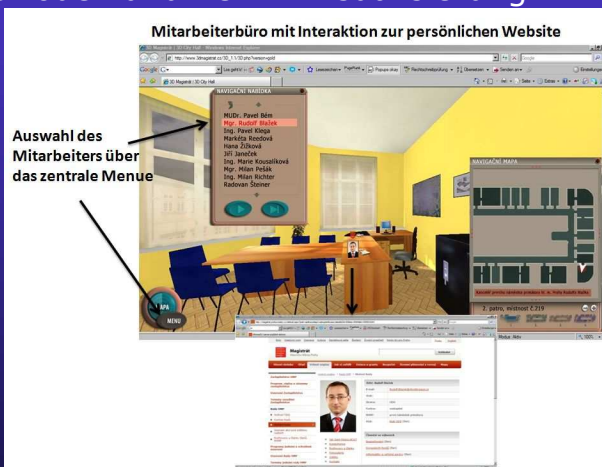


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3 Stadtmodell und LOD 4 Visualisierung

Mitarbeiterbüro mit Interaktion zur persönlichen Website



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2D = 3D =



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Navitainment – your web in the car



- 2D/3D map-view, 3D globe view, 3D birdsview, 3D streetlevel view, 3D interior view, LOD 1- 4
- Visualization of 3D routing
- Mixing of video, audio, flash and html embedded in 3D scenes
- Interactive zooming, panning, flyover, 6 degrees of freedom navigation of users
- Points of interest, landmarks, tourist information
- Robust and adaptive Internet retrieval, content streaming, local caching
- Night vision and weather

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