Viewing GML models in Bing maps

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# Approach

The first approach was to find out to which file the gml files needs to be converted in order to import them into Bing maps. The following page has been used:   
<http://msdn.microsoft.com/en-us/library/cc966728.aspx>  
  
Apparently .obj wavefront files were supported by Bing maps. The conversion method is written in ‘CityGML2OBJ.py’. For this conversion lxml has been used to read the gml files. To position the model the centroid of the model has been used and a transformation has been applied. The transformation was done with ogr module.

The uploading of the gml models has been done in php. In php the upload form was created and a table which loads 3D models from mysql database. Once a file has been submitted using ‘uploader.php’ it is processed by ‘CityGML2OBJ.py’. This model will be stored in a mysql database, this is also done by ‘CityGML2OBJ.py’. The viewer ‘3d\_bing\_maps\_viewer.php’ loads Bing maps and shows a table containing the uploaded models.

A local apache server with mod\_python and mysql database has been configured for testing. The final product can be seen on:  
<http://212.123.172.202/bing/3d_bing_maps_viewer.php>

In table 1 an overview of used libraries/modules can be seen. A short description of the files which are included in the zip package can be seen in table 2

Table : Overview of libraries/modules that have been used

|  |  |  |
| --- | --- | --- |
| **Name** | **Version** | **Description** |
| **\_mysql** | 1.22 for python 2.5 | Needed for communication between python and mysql database |
| **datetime** | Python 2.5 | Used when model is stored in mysql database |
| **lxml** | 2.2.4 for python 2.5 | For reading gml files |
| **mod\_python** | Python 2.5 | Needed to redirect user back to bing maps viewer after converting gml to obj |
| **osgeo** | GDAL-1.6.1 for python 2.5 | Used ogr for crs transformation |
| **StringIO** | Python 2.5 | To store vertices and faces |
| **sys** | Python 2.5 | Get passed arguments |

Under Ubuntu linux everything worked under python 2.6.

Table : Short description of files that were included in the zip package.

|  |  |
| --- | --- |
| **File** | **Description** |
| **3d\_bing\_maps\_viewer.php** | Loads bing maps, show available models in a table using mysql database and it contains an upload form |
| **CityGML2OBJ.py** | Does the conversion from gml to obj file and stores the model in mysql database. |
| **footprints\_extruded.obj** | Final result after converting the ‘footprints\_extruded.xml’ file |
| **footprints\_extruded.xml** | Demo file that has been used for testing |
| **sql** | Contains the structure of mysql database table |
| **uploader.php** | Does the uploading and validation of the file (only a xml file is allowed). If file uploaded it will execute CityGML2OBJ.py to convert the gml file to an obj file. |

# Encountered problems

* Accuracy problems when loading model in bing maps
* Orientation of 3D model, model needs to be rotated

# Final results

* url to our demo

# Resources

|  |  |
| --- | --- |
| **Link** | **Description** |
| [**http://msdn.microsoft.com/en-us/library/cc966728.aspx**](http://msdn.microsoft.com/en-us/library/cc966728.aspx) | Information about importing a 3D model into Bing maps |
| [**http://sourceforge.net/projects/mysql-python/**](http://sourceforge.net/projects/mysql-python/) | \_mysql python module |
| [**http://www.modpython.org/**](http://www.modpython.org/) | Used for executing python scripts on apache server |
| [**http://en.wikipedia.org/wiki/Centroid**](http://en.wikipedia.org/wiki/Centroid) | Information about how to find centroid of polygon |