

# Visualization of 3D models in 4K resolution using Vitrall

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## 1. Introduction

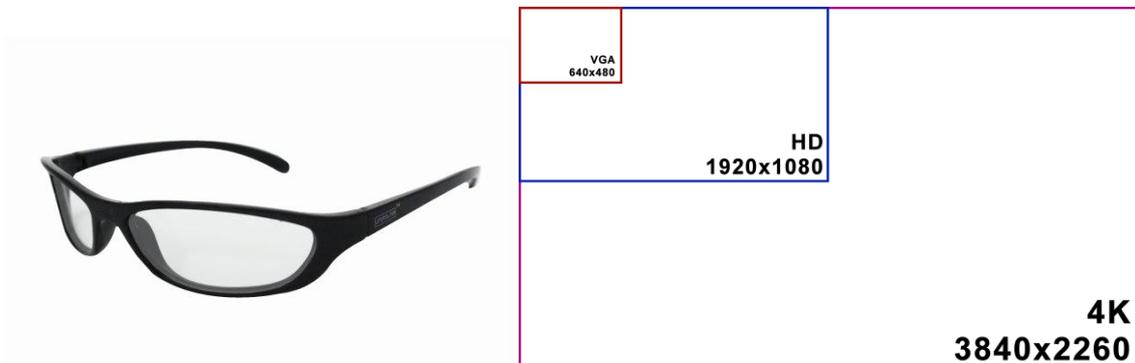
Vitrall is a distributed web based visualization system. It is under continuous development at PSNC Applications Department.

A typical scenario of Vitrall usage is a real-time visualization of a complex 3D content using remote servers equipped with modern multi GPU solutions, like nVidia Tesla. Following frames are compressed into JPEG pictures and sent over HTTP protocol to web browser clients. Still, they may be displayed on an attached screen or projector. Users may watch the same content from different points of view simultaneously. Information about users' input is sent back to the Vitrall control server using WebSocket protocol – part of HTML5 specification.

Thanks to the web based communication between all parts of the system (control server, many rendering units and clients), users may be located in different parts of the world and watch the same content. What is more, rendering units do not have to be gathered in one place. If a visualization in desired resolution and from several angles is too time-consuming to maintain an effect of animation, more render units may be used, if available.

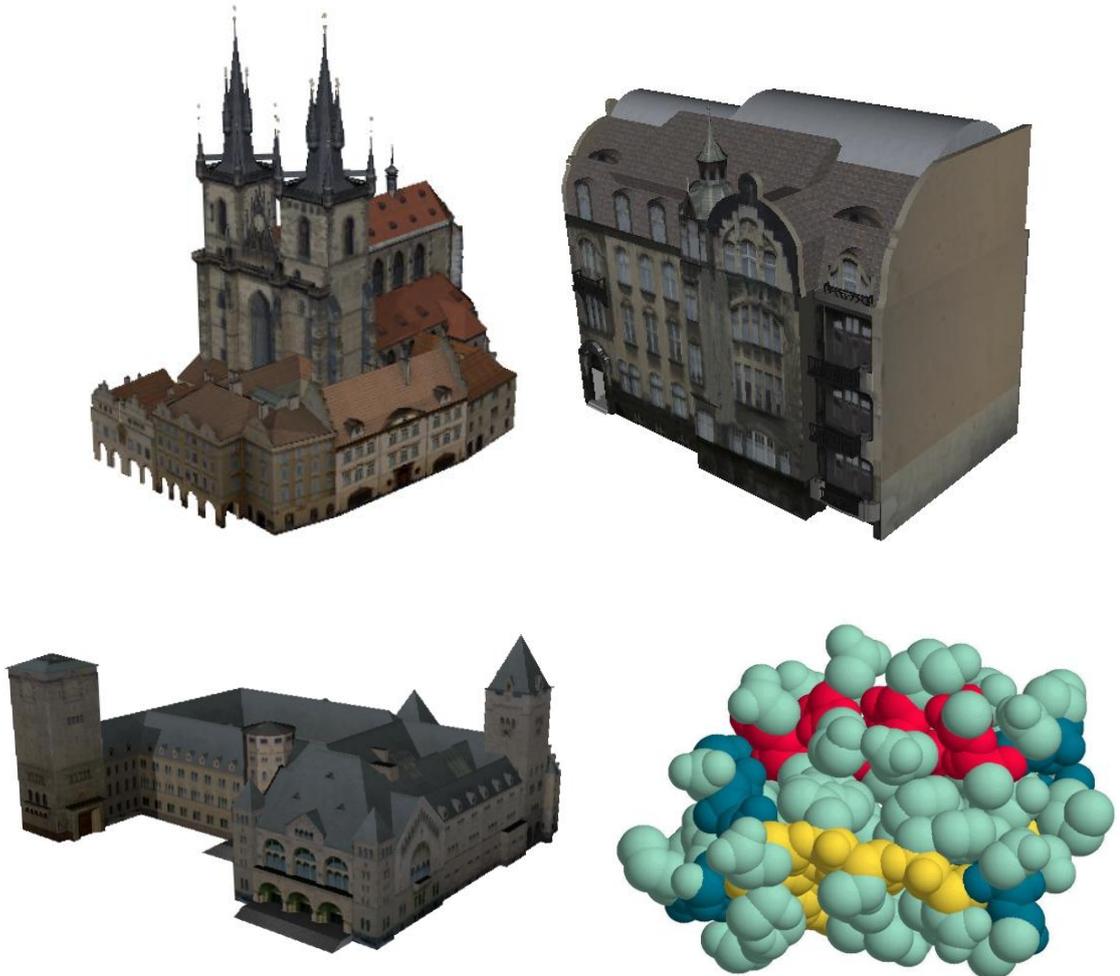
## 2. Demonstration

For the TERENA conference the following scenario is prepared. Using two 4K projectors equipped with polarizer filters and utilizing Vitrall's ability to render simultaneously from many points of view, show various 3D models with a stereoscopic effect. Audience will be equipped with polarized 3D glasses. Viewers will be able to change angle and distance to the object through a web browser, where the same content will be displayed.



### 3. Content

Vitrall can render 3D models prepared in the COLLADA format. Google 3D Warehouse contains lots of interesting models, also models of buildings that can be viewed in Google Earth. On the TERENA conference known buildings from both Poznań and Prague could be shown (pictures below). Another possible topic are visualizations of subjects being in PSNC area of interests, like protein structures.



### 4. Equipment

Beside of 4K projectors, following equipment is needed:

- two graphic cards (one for each projector) with at least 4 graphic outputs,
- one additional graphic card (for rendering content that is seen in a web browser),
- a computer to host GPUs,
- at least one simple laptop to interactively control the scene,
- switch/router (if more controlling laptops will be used).

The third graphic card can be placed in a separate machine than the first two. GPUs connected to projectors should be installed in a single machine for the sake of synchronization.