

Presentarium: a useful slide-converting tool for digital planetariums

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Abstract

The spread of digital planetariums is limited nowadays, although their use could be extended. These systems can be used not only for astronomical purposes, but also for all kinds of presentations. However, the normal images appear distorted on the planetarium dome, thus the lecturers must have a high-level computer literacy if they would like to use the planetarium for their presentations. We developed the so-called Presentarium software, which can convert simple, plain presentation slides into spherical ones. Projecting the converted slides onto the hemispherical dome of a planetarium, the audience has an impression as if the dome were plain. Therefore, this conversion tool allows the lecturer to project also plain slides in planetarium without distortion. With this tool the advantages of plain and spherical projecting surfaces can be easily combined, and thus the usability of digital planetariums can be enhanced. In our talk we present our slide-converting software.



PRESENTARIUM:

A Useful Slide-converting Tool for Digital Planetariums



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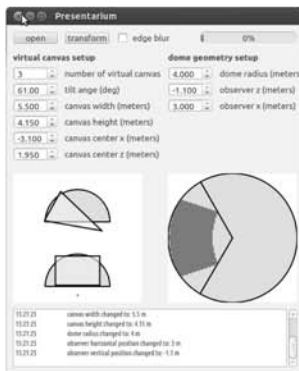


Figure 1: A screenshot of our Presentarium slide-converting program

The spread of digital planetariums is limited nowadays, although their use could be extended. These systems can be used not only for astronomical purposes, but also for all kinds of presentations. The normal images appear distorted on the planetarium dome, thus the lecturers must have a high-level computer literacy if they would like to use the planetarium for their presentations. However, to create spectacular presentations is a basic requirement in both business and scientific life.

We developed the so-called Presentarium software, which can convert simple, widespread, plain presentation slides into spherical ones. Projecting the converted slides onto the hemispherical dome of a planetarium, the audience has an impression as if the dome were plain.

Therefore, this conversion tool allows the lecturer to project also plain presentation slides (e.g. made with Microsoft PowerPoint) to large virtual canvases in digital planetariums without distortion. With this tool the advantages of plain and spherical projecting surfaces can be easily combined, and thus the usability of digital planetariums can be enhanced.

Technical solution

We prepare the converted slide with the method of ray-tracing. We place the virtual canvases to the planetarium dome. The canvases can be placed anywhere relative to the dome. The position, size, tilting angle and the number of the canvases can be set manually in the program (Figure 1). The planetarium geometry, such as the dome diameter and the position of the observers relative to the dome center can also be adjusted (Figure 1). The canvases can be placed anywhere compared to the dome. Then we put the input (plain) slide to the virtual canvases. After that we go through the projected pixels and connect the observer position and the projected pixels of the digital planetarium with straight lines. For every line we calculate the intersection with the virtual canvas and look, which pixel we hit on there. Then we adjust the given dome pixel to the same color.

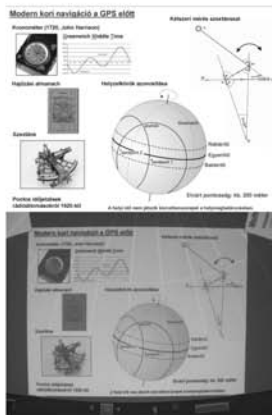


Figure 2: A normal plain slide edited in Microsoft PowerPoint and the converted slide projected to a 6.5 m × 4.9 m virtual canvas in the 8 m diameter digital planetarium of the Eötvös University



Figure 3: An iconic scene from the movie Avatar, and the converted image projected to a 8 m × 4.5 m virtual canvas in the 8 m diameter digital planetarium of the Eötvös University

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With our Presentarium software we have received the first prize in innovative idea grants for students at Eötvös University in 2013. This work was supported by the grant OTKA K-105054 received by G. Horváth from the Hungarian Science Foundation. We are grateful to Prof. K. Petrovay, head of the Department of Astronomy of the Eötvös University (Budapest), who made the planetarium of the Eötvös University available to our application.

If you are interested in our Presentarium software and would like additional information, please contact us.

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Szombathely, Hungary, 14-16 May, 2014

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