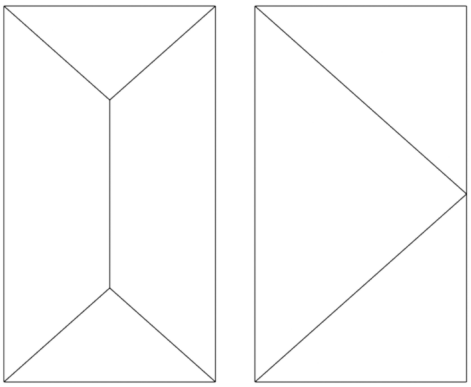
DESIGNING A PORTABLE HOLOGRAPHIC SOLUTION

The VR-Lab of the University of Twente is always in need for new tools for research and development. A device being able to show holograms is a sensible addition to the current available devices.

The goal of the assignment was to design a mobile holographic solution. There are not many devices on the market for displaying holograms. With the help of a brief the outcome was to make a redesign of a holographic pyramid.

Based on a more than two hundred years old illusion called 'Pepper's Ghost', the technique behind a holographic pyramid is straightforward. A television or projection screen projects an image that is reflected towards the user by the use of a transparent panel. The image 'floats' in front of the user and the illusion of a hologram has been created. This is done on three to four sides, which creates a pyramid of panes, resulting in the ability to view model from multiple sides.

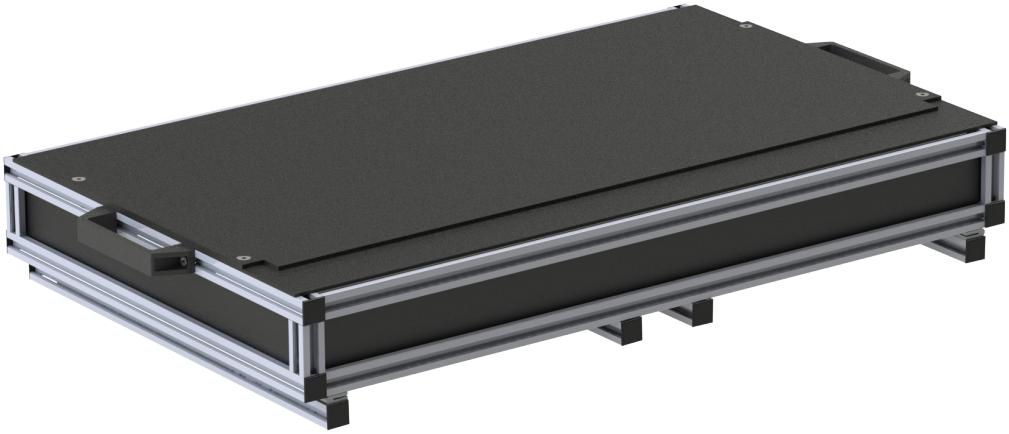


To help creating a desirable design, a list of the requirements of a portable holographic pyramid has been put together. The major subjects of these requirements are the portability, producibility and the cost price of the device. Creating an inelaborate design should influence the producibility and the cost price positively. Portability will be ensured by a maximum allowed size and

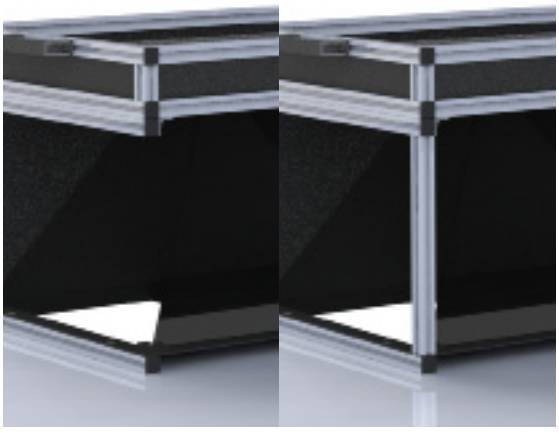
weight for the pyramid.

With respect to the requirements, a design of a holographic pyramid has been established. Only three sides instead of four are used in the design, because this creates better ratios between the different sides.

ly available and completely modular, this all helps the producibility of the design. The stability of the frame is ensured by an analysis of the deflection of the frame with two as well as four pillars lifting the upper frame.



Polycarbonate will be used for reflecting the television screen since it is sixty percent lighter and has a higher reflectivity than glass. To increase the contrast of the hologram and remove the effect of a double reflection, the glass will be tinted. The frame of the device will be made out of aluminium slotted extrusion profiles. These profiles are lightweight, firm, wide-



To ensure the transportability of the device, the device is collapsible. When one collapses the frame all the loose parts can be stored in the upper frame. The bottom plate normally supporting the reflective pyramid, will function as a lid.

By not including a notebook or a computer in the design, the price will be kept as low as possible. Computers are widely available nowadays, the device depends on the idea of being able to use one his own notebook or a spare computer.

With the help of Unity one can load models onto the device. Numerous possible interactions with the holograms are possible since Unity is a completely programmable software environment. It is necessary to illuminate the 3D-model in the Unity-scene from above, this creates a better perception

of a spatial object. Rotating the object is another useful cue for increasing the depth perception of the 2D-hologram.

The created design provides the asked portability in terms of size. It is still a heavy device, but this is not very important since the device always should be carried by two people because of the bulkiness created by the size of the television screen. There are still some parts the user has to produce himself or needs to be ordered to be produced. This is inevitable since some odd-shaped parts are required.

Further research need to be conducted on the possible functionalities of the holographic pyramid. The device is usable, but it is not clear what its real purpose is.

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