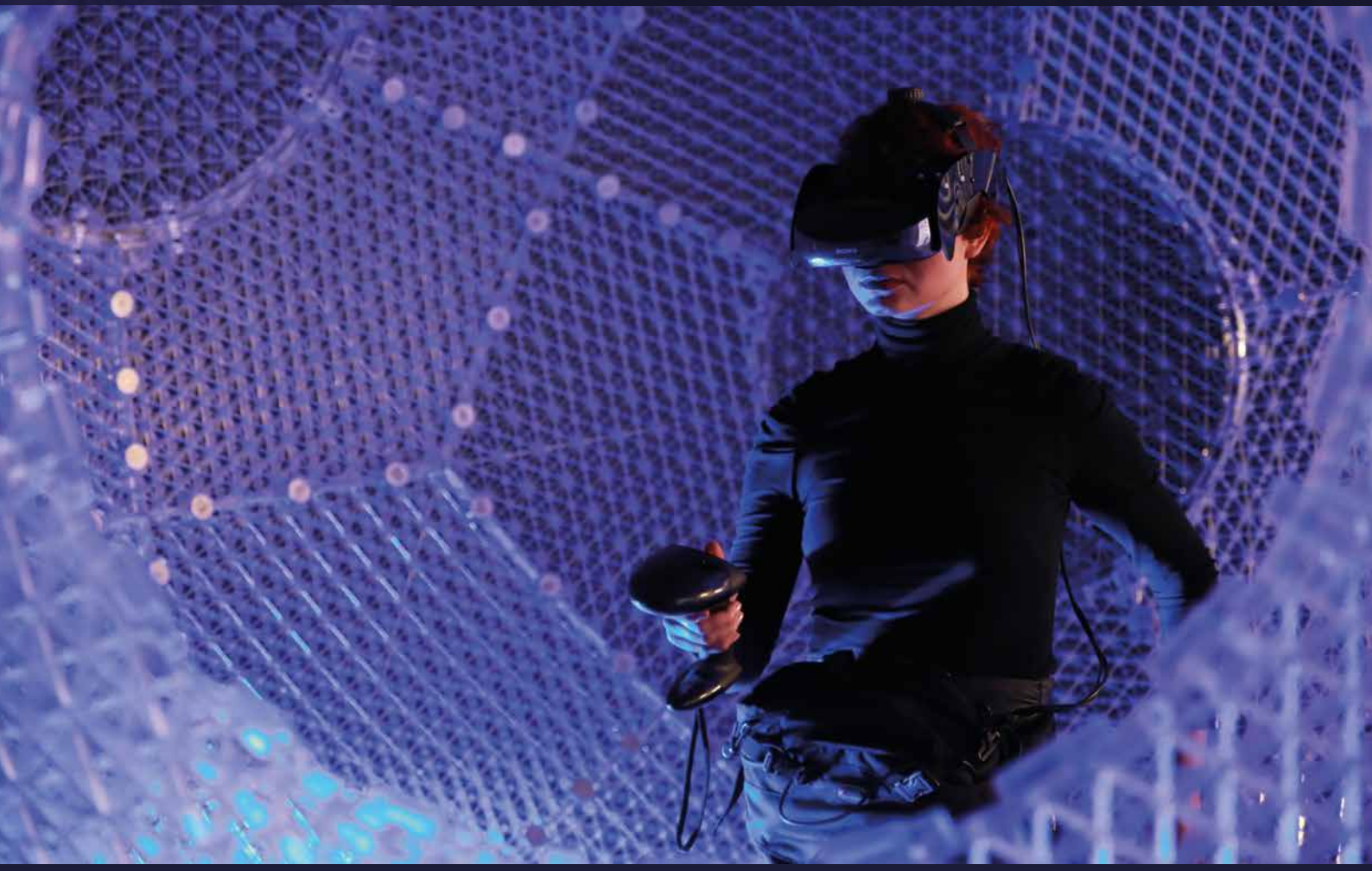
Virtual Reality 3D



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3D

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Virtual Reality 3D

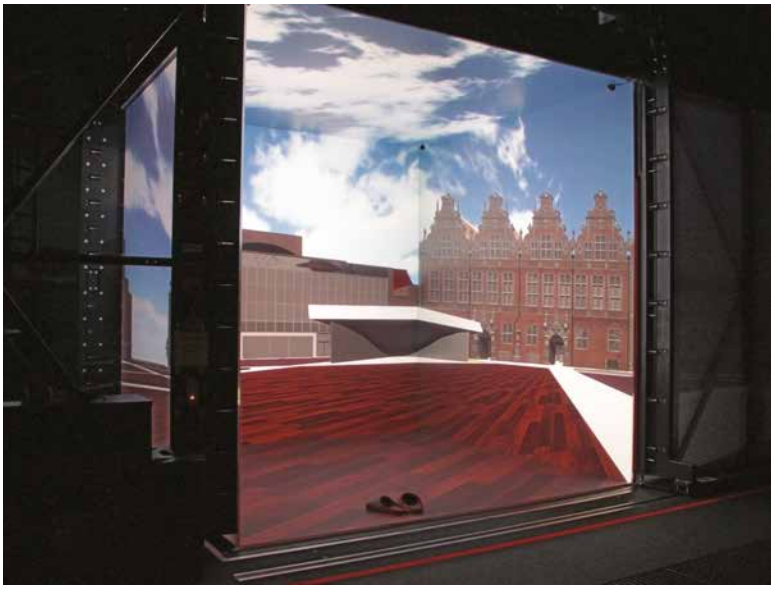
Virtual Reality 3D is an image of artificial reality, created with the use of Information Technology.

Virtual Reality is mixing and interacting with our real world more and more often. It serves us as a tool that drastically reduces the cost of such activities as: researching, designing or gaining experience.

Virtual Reality has many practical applications. It is primarily used for training, science and simulation. In such fields of our lives as army, industrial engineering or medicine, Virtual Reality is an invaluable tool for totally safe training of the staff working every day at high risk operations. The contents, experiences, all the elements of Virtual Reality are as close as possible to the real ones and they let simulate situations that may happen in real life.

Virtual reality can also create artificial and imaginary world that can stimulate our imagination: the world, in which essential, well-known principles and laws can be broken and replaced with others. It allows you to sense emotions, which real world is not able to provide us with.

Creating Virtual Reality system is a complex process, in which firstly we have to establish the purpose and the main functionality. At the preliminary stage, depending on our needs, an appropriate system of projection has to be chosen for our application.



Stereoscopic 3D Projection

In Stereoscopic 3D Projection Technology two images, seen from the perspective of the left and the right eye, are projected simultaneously.

Because of eye-spacing (the distance between the right and the left eye, it is usually 4 - 6 cm), each eye has slightly different perspective. Two different images are sent to our brain. The difference between these diverse images is called a parallax and it is interpreted as depth.

Stereoscopic projection is based on the same rule: two slightly different images are projected on the screen. Thanks to the system the image on the left can be seen with the left eye and the image on the right can be seen with the right eye. There are two types of stereoscopic 3D projection systems: active - which uses shutter glasses and passive, for example. Infitec, that uses glasses with interference filters. The Infitec Technology, making use of the separation of the spectrum, is one of the most advanced technologies for displaying 3D images.

Motion Capture Systems

Virtual reality is a computer-generated world in which the user can perform activities and tasks, using movements and equipment typical for the real world. The user sees the stereo image and is able to estimate the distance and proportions. It may also use his own hands to manipulate virtual objects and devices. In such cases, Tracking Systems form a very important part which significantly improves the quality of interaction.

In our work we make use of the following technologies:

» Finger Tracking,
» Body Motion Tracking,
» Virtusphere,
» Eye Tracking.

Immersive 3D Visualization Laboratory (LZWP)

Virtual Reality 3D Installation has been created for the purposes of Immersive 3D Visualization Laboratory at the Technical University of Gdansk and is one of the three in the world in terms of applied projection system and the first one that uses a spherical simulator of the walk as a control device.

The application is a six-wall structure with 3D stereoscopic projection displayed on all the walls / screens by 12 projectors. The image is generated on all screens and has the unique perspective shown to the user equipped with leading glasses. The Laboratory is now used as application helping to determine the future use of virtual Reality in other fields of science and industry. It is also an excellent basis for research and development of VR Technology (Virtual Reality).

Integra AV

The company Integra AV creates professionally 3D Virtual Reality Systems and delivers complete VR solutions, which include:

- 3D Projection Systems,
- Motion Tracking Systems,
- Software for displaying an optimized image for the projection system being applied,
- Control Systems,
- Audio Systems,
- Mechanical Systems,
- Pneumatic systems.

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