

**Slawomir BOGACKI**

Silesian Technical University

Geometry and Engineering Graphics Centre

Krzywoustego 7 Street

44-100 Gliwice - POLAND

Tel./ fax: +48 32 237 26 58,

e-mail: slawomir.bogacki@polsl.pl

## INTERACTION IN REAL TIME GRAPHICS

Issues concerning the technology of creating interactive visualizations will be shown in presentation. Methods of realization algorithms which control movement of scene objects and are used for releasing the action bound by occurring different logic conditions well be also discussed. The presentation will be illustrated using examples visualizations of buildings and machines.

Spatial models of objects used in visualisations has been made in 3D Studio MAX program. Real time applications has been realised using the object programming software Quest 3D. This software is used for creating interactive 3D applications. The editing environment of Quest3D is completely graphics. 3D applications are created by connecting together functional blocks called "channels". The structure of 3d applications are represented by channels which are connected in graph. The graphics of Quest 3D engine calls each channel connected to the logic graph of application while the rendering process. The image of 3D scene in this way is created. Spatial models imported to Quest 3D are in the logic graph form. The graph contains the information about the object such as:

- Transformation matrix, (channel „motion”) which localize the objects in 3D space
- Offset matrix, which is can be used as a pivot point
- The geometry of object (channel "Vertex data"). This channel is not editable
- Material which contains data about colour, transparency, glossiness and texture.

Creating algorithms with control values of object parameters as above is a method of building the application 3D. Particularly, very important are algorithms controlling values localizing the objects in 3D space. Algorithms are created by using typical logic operators as And, Or, NOT, If, IfElse. Moreover a values in matrix and vectors are controlled by using different mathematical value operators.

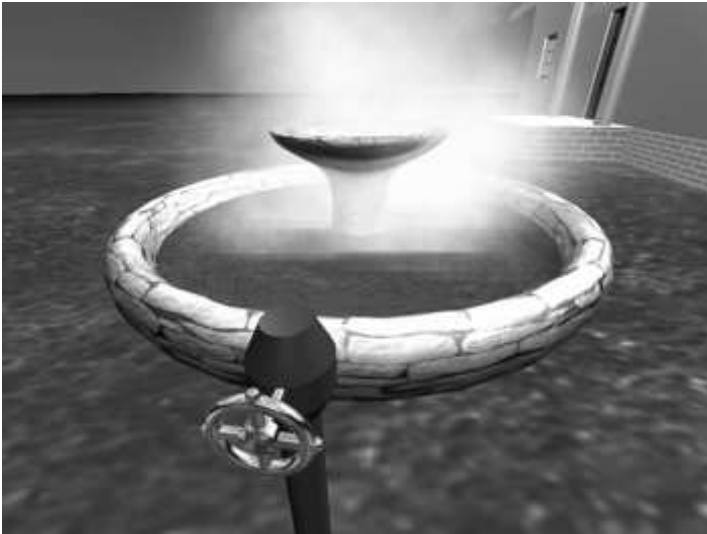


Fig.1 The example of controlling the fountain in 3D visualisation.

A collision detections is a very useful and important elements of interactive applications. Such logic events as: pointing objects by mouse cursor or camera, collisions of geometry can be used for creating very interesting visualizations. The different solutions of interactions in real time visualizations will be shown in presentation

## References

1. Bogacki S. The movement of objects in real time graphics. Proceeding of 6th International Conference, Ustroń, June 2007. Silesian University of Technology. Geometry and Engineering Graphics Centre.
2. Bogacki S. Terczyńska E.: Visualization of architectural objects – new tools and new possibilities. 10th International Conference on Geometry and Engineering Graphics BALTGRAF. Vilnius, Lithuania, June 2009.
3. Hast A.: Understanding rotations and their applications. Proceeding of 5th International Conference, Ustroń, June 2007. Silesian University of Technology. Geometry and Engineering Graphics Centre.