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MODELING AND VISUALIZATION OF SELECTED GEOMETRICAL ASPECTS RELATED TO REGULAR SOLIDS IN AUTOCAD, 3DS MAX AND RHINOCEROS 3D SOFTWARE

Keywords: *visualization, Platonic solids, polyhedron nets, AutoCAD, 3DS MAX, Rhinoceros 3D*

Visualization of selected geometrical aspects related to regular solids in AutoCAD, 3DS max and Rhinoceros 3D software was presented.

Classification of solids was elaborated and the situation of regular solids, to which Platonic solids and regular polyhedral compounds belong, within this classification was given. Definitions for each solid type were provided as well as their basic characteristics. Also basic information on the history of their discovery was given.

The methods for the creation of 3D models of regular solids in each of the computer programs were presented, as well as the most often encountered difficulties.

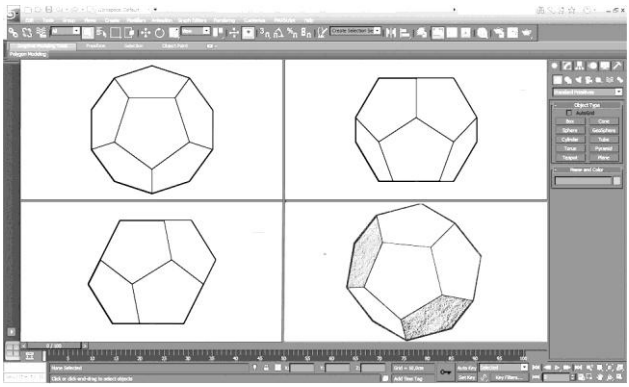

Fig. 1 Regular dodecahedron – modeling in 3DS Max 2013

Another subject given the consideration was the modeling and visualization of cross sections of regular solids within a given plane, again in each of the programs. In addition, creation of projections on the basis of such models was discussed.

The last discussed topic was the creation of polyhedron nets of regular solids on the basis of previously prepared 3D models. Functionalities of the Rhinoceros software were explored in this context.

A comparative analysis of the capabilities of the various pieces of software, as far as modeling and solving of geometrical tasks related to regular solids is concerned, allows to easily identify the program that enables the fastest and the most effective solution to a given task.

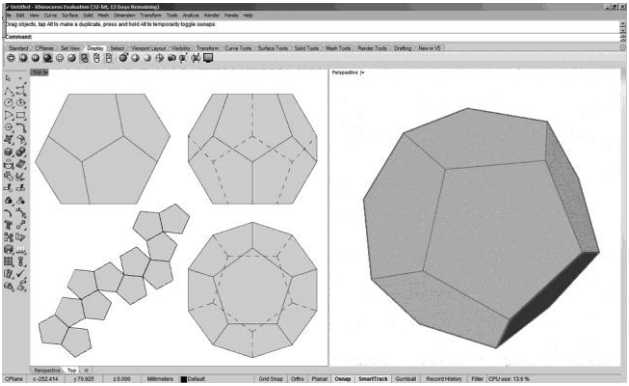

Fig. 2 Regular dodecahedron – modeling in Rhinoceros 3D 5.0

References

[1] Bertoline G. B., Wiebe E. N., Hartman W., Ross W. A., Fundamentals of Graphics Communication, McGraw-Hill Higher Education, New York, 2011

[2] Cheng R. K.C.: Inside Rhinoceros 4. Thomson/Delmar Learning in Clifton Park, New York, 2008

[3] Nassery F.: Zagadnienia geometryczne występujące w tworzeniu struktur architektonicznych. Doktorat - praca niepublikowana, 2011.

[4] Omura G., Mastering AutoCAD 2010 and AutoCAD LT 2010. John Wiley & Sons Inc., New York 2009.

[5] Pasek J.: Wizualizacje architektoniczne. 3ds Max 2013 i 3ds Max Design 2013. Szkoła efektu. Wydawnictwo Helion, Gliwice 2014.

[6] Pikoń A., AutoCAD 2013 PL. Pierwsze kroki, Wydawnictwo Helion, Gliwice 2013.