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## **PARALLEL PERSPECTIVE - INNOVATIVE CONSTRUCTION METHOD OF ISOMETRIC PROJECTION**

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Basic feature of perspective representation of any three dimensional (3D) object is that the parallel lines creating its parallel edges converge at a single point which is called a vanishing point. In perspective drawings any line  $\mathbf{a}$  will be represented by the line  $\mathbf{a}^s$  which will go through two specified points:  $\mathbf{T}_a$  being the trace of the line  $\mathbf{a}$  in the picture plane and the vanishing point  $\mathbf{V}_a$  which is the image of a point at infinity and lying on the line  $\mathbf{a}$ .

Analogically, we will discuss the new method of creation of various axonometric images (=pictorials), where the reference to the perspective projection will be found and the parameters will be intentionally specified. Any line  $\mathbf{a}$  will be determined by its two points:  $\mathbf{T}_a$  as being the trace of the line  $\mathbf{a}$  in the axonometric picture plane and the vanishing point  $\mathbf{V}_a^\infty$  which is the point lying at infinity for this case. The clue point of the solution is that there is no need to construct any isometric scales for the principal lines belonging to the Oxy plane.

The method has been originally elaborated by Zdziarski and popularized also by Górska and Leopold [3] in Germany.

Creation of axonometric views or axonometric pictorials will be discussed in terms of:

1. Specification of the parameters of axonometric views: specifying the Oxyz co-ordinate system and the axonometric picture plane in reference of the assumed direction of observation,
2. Parametric analysis of two methods used for assuming the direction of observation,
3. Description of the innovative aspects which have been introduced into the axonometric views construction,
4. Comparative analysis of the two methods: perspective and axonometric projection methods: similarities and differences.

The method described by the authors can be used in practical construction problems when it is necessary to easily produce pictorials of 3-dimensional objects. As being so much intuitive, the method enhances spatial visualization abilities. By analyzing the direction of observation and by intentionally selecting the parameters of axonometric views, we can simply grasp the idea of understanding the final form of the coming image.

References:

- [1] Bartel K.: *Perspektywa malarska*, PWN, 1958
- [2] Otto F, Otto E: Podręcznik geometrii wykreślnej, PWN, 1975
- [3] Leopold C.: *Geometrische Grundlagen der Architekturdarstellung*, Kohlhammer, 1999, p.204
- [4] PN EN ISO 5456: 2002 Rysunek techniczny – Metody rzutowania – Część 1: Postanowienia ogólne,
- [5] PN EN ISO 5456: 2002 Rysunek techniczny – Metody rzutowania – Część 3: Rzutowanie aksonometryczne,
- [6] PN ISO 128-30:2006 – Rysunek techniczny – Zasady ogólne przedstawiania. Część 30: Wymagania podstawowe .dotyczące rzutów,
- [7] <http://www.arch.pg.gda.pl/>strona Wydziału Architektury, Katedra Sztuk Wizualnych