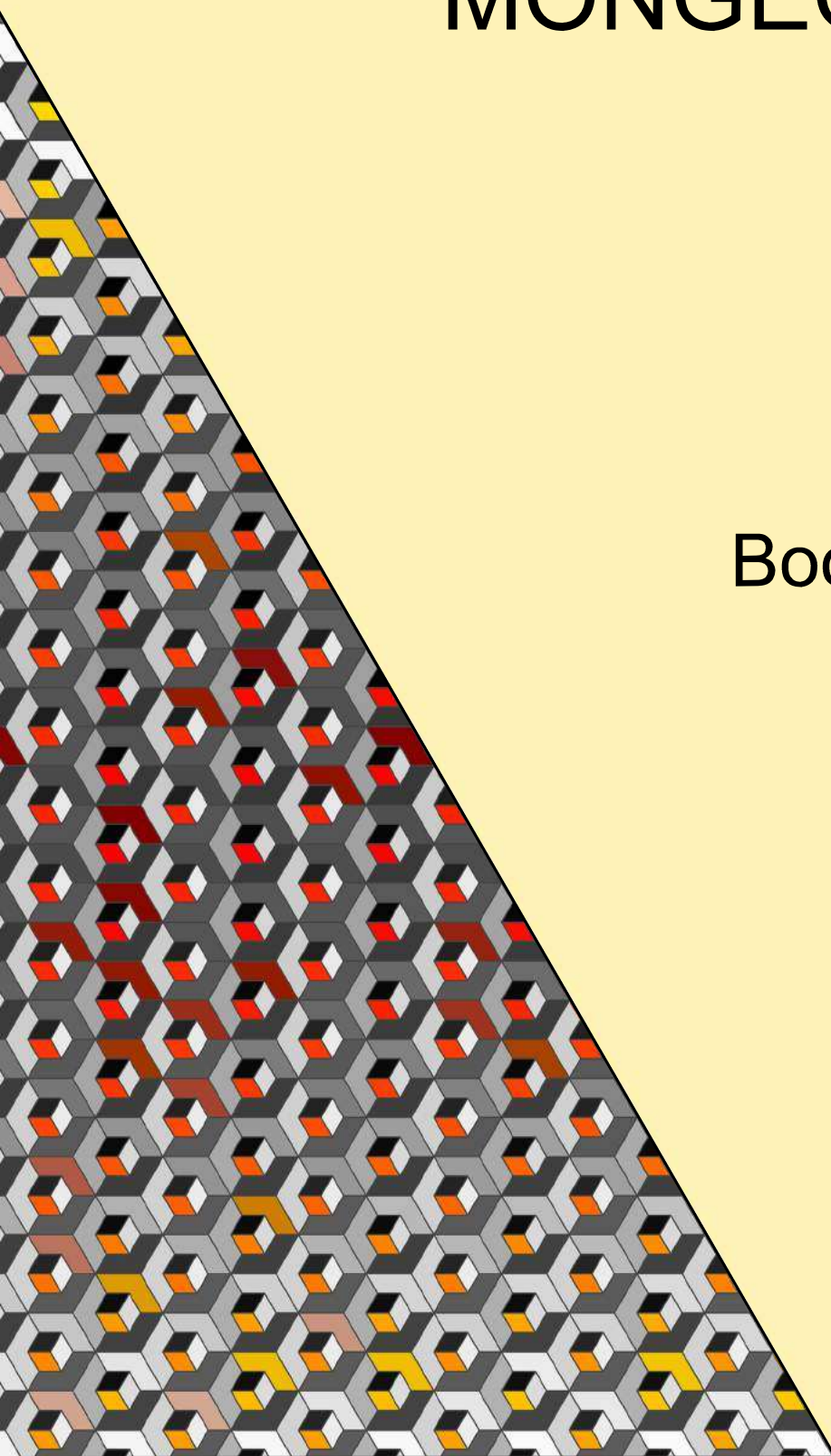


6<sup>th</sup> International Conference  
on Geometry and Graphics

# MONGEOMETRIJA 2018

Book of Abstracts



The 6<sup>th</sup> International Conference on Geometry and Graphics  
**MONGEOMETRIJA 2018**

**BOOK OF ABSTRACTS**

**MONGEOMETRIJA**

**2018**

June 6<sup>th</sup> – 9<sup>th</sup> 2018 Novi Sad, Serbia

Faculty of Technical Sciences  
Novi Sad 2018.

The 6<sup>th</sup> International Conference on Geometry and Graphics  
**MONGEOMETRIJA 2018**

**Publishers**

Serbian Society for Geometry and Graphics (SUGIG)  
Faculty of Technical Sciences, University of Novi Sad

**Title of Publication**

BOOK OF ABSTRACTS

**Editor-in-Chief**

Vesna Stojaković

**Co-Editor**

Bojan Tepavčević

**Graphic design**

Vesna Stojaković

**Formatters**

Vesna Stojaković, Marko Vučić, Jelena Kićanović

**Printing**

Faculty of Technical Sciences – Graphical Center GRID

Number of copies printed 100

ISBN 978-86-6022-054-9

The 6<sup>th</sup> International Conference on Geometry and Graphics  
**MONGEOMETRIJA 2018**

**Conference Organizers**



Serbian Society for Geometry and Graphics (SUGIG)



Faculty of Technical Sciences, University of Novi Sad



Department of Architecture and Urban Planning, Faculty of  
Technical Sciences, University of Novi Sad



Digital Design Center

**Under the auspices of**



Provincial Secretariat for Higher Education and Scientific  
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taking into account the geometric and compositional principles of creating beauty and using inexpensive material. On the other hand, this is a religious structure that was ahead of its time in some respects. The architecture of Archangel Michael's Church combines both the ancient and eastern religious architectural tradition with Renaissance elements. Then again, this is a religious structure that in some respects is revolutionary, modern, and at the same time traditional. According to one researcher the compositional key is based on the seal of Hermes. The same author uses gematria to try to decipher the secret messages that the architect is believed to have built into the church. The results presented are based on determining the compositional characteristics of the structure. Namely, an analysis and comparison of the scales of the plans for the current building shows that the church is a veritable treasure house of different proportions. The supporting structure is rationally based on a square raster network of 2.5 m x 2.5 m. The composition of the distribution of the other elements of the building is based on the "Hermetic Seal," the golden cut, and others. The composition appears in the layout as well as on the facades and individual elements of the church and its furnishings. At the same time, it links the layout and facades together. It is only in this way that it is possible to prove the beauty and harmony that a person feels when visiting this sacred place.

Keywords: architecture, Plečnik, Archangel Michael's church, composition.

## THE LANGUAGE OF PROPORTIONS IN THE PARAMETRIC FRAME: EXQUISITE SERBIAN MEDIEVAL CHURCHES OF RAŠKA STYLE GROUP

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### Abstract

Architectural overview of some historical building is certainly not complete without its proportional analyzes. This study is conducted by the proportion-as-ratio principles for analyzing *sacred* structures, hence highlighting geometry, both in the sense of geometric interplay of basic shapes (equilateral triangle and circle) and mathematical ratio expressed by formula such as 1:1, 1:2,  $1:\sqrt{2}$ , 1:1.61 (the golden mean),  $1:\sqrt{3}$ ,  $1:\sqrt{5}$ ,  $1:\sqrt{6}$ ,  $1:\sqrt{7}$ , etc. Among the three common types of proportional systems, applied in Serbian medieval architecture (square, triangular and golden section), triangular proportional system is specifically related to the so-called *Raška* style group. The guiding idea of the paper is to test three similar floor plan design patterns of the three exquisite medieval structures on unique proportioning system and 3D modeling of the interior space by parametric interpretation of each structural element of the whole (arch, vault, dome and apse). Parallel overview of the main churches of Studenica, Žiča and Gradac contains 2D drawings (floor plans and vertical sections), along with proportional analyzes of their structural elements. Each of the three floor plan design patterns complies with I. Štambuk's proportional canon, additionally enriched with intriguing triangular scheme. 3D models are created as "empty space molds" of the church interior, by modeling each element of the structure in Autodesk Revit software.

Keywords: medieval Serbian churches, church floor and section pattern, triangular proportional system, parametric 3D model, the so-called *Raška* style.



Publisher

**Faculty of Technical Sciences**

Trg Dositeja Obradovića 6, Novi Sad, Serbia

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CIP - Каталогизација у публикацији  
Библиотека Матице српске, Нови Сад

514.18(048)

004.92(048)

**INTERNATIONAL Scientific Conference moNGeometrija (6 ; 2018 ; Novi Sad)**

Book of Abstracts / The 6th International Scientific Conference on Geometry and Graphics moNGeometrija 2018, June 6th-9th 2018, Novi Sad, Serbia ; [editor-in-chief Vesna Stojaković]. - Belgrade : Serbian Society for Geometry and Graphics (SUGIG) ; Novi Sad : Faculty of Technical Sciences, 2018 (Novi Sad : Grid). - 56 str. ; 30 cm

Tiraž 100.

ISBN 978-86-6022-054-9

a) Нацртна геометрија - Апстракти b) Рачунарска графика - Апстракти  
COBISS.SR-ID **323606791**

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