

*Accompanying program of the 7th International scientific
conference
“moNGeometrija 2020”*



DIMENSIONS REFLECTED

CATALOG

EXHIBITION OF IDEAS, DESIGNS AND MODELS/
IZLOŽBA IDEJA PROJEKATA I MODELA

September 19-21. 2020.

Faculty of Mechanical
Engineering/Mašinski fakultet
Kraljice Marije 16
Room 513
11000 Belgrade
Serbia

Curator/Kustos
Dr. Marija Obradović

Publishers / Izdavač

Faculty of Mechanical Engineering, University of Belgrade

Title of publication/ Naslov publikacije

Dimensions reflected - catalog

Editor in Chief / Glavni urednik

Marija Obradović

Exhibition curator / Kustos izložbe

Marija Obradović

Editorial board / Uredništvo

Zorana Jeli

Branislav Popkonstantinović

Mirjana Devetaković

Reviewer / Recenzent

Branislav Popkonstantinović

Text editor and proofreader / Lekotr i korektor

Tatjana Grujić

Graphic design / Grafički dizajn

Design büro - Uroš Alavantić

Number of copies/ Broj štampanih primeraka

60

Print

Planeta print, Belgrade

Dean's decision number 15/20 from 20.08.2020.

ISBN 978-86-6060-049-5

All rights reserved.
No parts of this publication may be reprinted
without either the prior written permission of the publisher.

Organizers / Organizatori



Serbian Society for geometry and graphics (SUGIG)



Faculty of Mechanical Engineering, University of Belgrade

Co-organizers / Koorganizatori



Faculty of Civil Engineering, University of Belgrade



Faculty of Architecture, University of Belgrade



Faculty of Transport and Traffic Engineering, University of Belgrade



Faculty of Applied Arts, University of Arts in Belgrade

Under the auspices of



Ministry of Education, Science and Technological Development of Republic of Serbia

Selection Committee / Odbor za odabir

Ioanna Symeonidou, PhD, Assistant Professor, Department of Architecture, University of Thessaly, Greece

Vesna Stojaković, PhD, Associate Professor, Faculty of Technical Sciences (FTN), Novi Sad, Serbia

Giampiero Mele, PhD, Full Professor, University e-Campus, Italy

Dr Naomi Ando, architect, Hosei University, Tokyo, Japan

Jelena Milošević, PhD, Assistant Professor, Faculty of Architecture, University of Belgrade, Serbia

Mateja Budin, mathematician, Head of Mathema, the Institute for Popularization of Mathematics in Ljubljana, Slovenia

Ratko Obradović, PhD, Full Professor, Faculty of Technical Sciences (FTN), Novi Sad, Serbia

GianLuca Stasi, PhD, Ctrl+Z Studio Founder, Univesidad de Sevilla, Spain

Tanja Manojlović, Full Professor at the Faculty of Applied Arts, the Department of Interior and Furniture Design, University of Arts in Belgrade, Serbia

AWARDS/ Nagrade

THE MAIN CATEGORY / GLAVNA KATEGORIJA

FIRST AWARD / PRVA NAGRADA: TriX Modular Toy
Vladimir Zagorac

SECOND AWARD / DRUGA NAGRADA: Free-form Circular Mesh System for Concrete 3D Printing
Zlata Tošić, Martin Friedrich Eichenauer, Daniel Lordick and Sonja Krasić

THIRD AWARD / TREĆA NAGRADA: Deltahedral Column Capitals
Marija Obradović

SPECIAL MENTION / POSEBNA POHVALA : Weberian Focal-directorial Surface of Cassini's Type
Marko Vučić, Marko Jovanović, Maja Petrović, Radovan Štulić, Branko Malešević

PERSPECTIVE – the Students and Educational category / Studentska i edukativna kategorija

FIRST AWARD / PRVA NAGRADA: (Word + Flood) x 164
Kazmy Chi Muñoz

SPECIAL MENTION/ POSEBNA POHVALA: Planar Morphing Tessellation
Radmila Durašinović and Marko Jovanović

Contents / Sadržaj

Curator's Foreword Excerpt from the Review	7
Predgovor KUSTOSA Izvod iz recenzije	8
Main program – DIMENSIONS REFLECTED	
TriX Modular Toy	10
Vladimir Zagorac	
Free-form Circular Mesh System for Concrete 3D Printing	11
Zlata Tošić, Martin Friedrich Eichenauer, Daniel Lordick and Sonja Krasić	
Deltahedral Column Capitals	12
Marija Obradović	
Weberian Focal-directorial Surface of Cassini's Type	13
Marko Vučić, Marko Jovanović, Maja Petrović, Radovan Štulić, Branko Malešević	
Clamshell pavilion	14
Marko Vučić et al.	
Perforated Panel for Daylighting Control	15
Nikoleta Stamenković and Marko Jovanović	
Parametric Modeling of the Church in the Studenica	16
Jelena Bogdanović et al.	
Design of the realized solar race car Emilia 4, for the national Italian team Onda Solare	17
Marko Luković	
Cardboard Design CARTORAMA	18
Tijana Sekulić et al.	
4- and 5-dimensional regular solids move in the computer 2-screen with visibility effects	19
Emil Molnar, István Prok and Jenő Szirmai,	
Parametric Model of a Rectangular Flat Vault	20
Teodora Nikolić et al.	
The Building Phases of Cologne Cathedral and its Predecessors (with a Special on Inner Choir 1856)	21
Dominik Lengyel and Catherine Toulouse	
Phantasms	22
Miljan Stevanović	
Spiraling Sea	23
Iva Kodrnja.	

Contents / Sadržaj

DIMENSIONS REFLECTED - PERSPECTIVE – Students and Educational category

(Word + Flood) x 164	26
Kazmy Chi Muñoz	
Planar Morphing Tessellation	27
Radmila Durašinović and Marko Jovanović	
Galery – Hyperbolic paraboloid	28
Petar Boranijašević	
Ruled Surface Fence	29
Isidora Ristovski and Biljana Branković	
Waterbomb pavilion	30
David Danji and Emeše B. Varga	
Exhibition Space	31
Martin Stojančov	
Module and space	32
Mirjana Milakić et al.	
Shape Design	33
Marijana Paunović	
An additional students' task at Descriptive Geometry	34
Magdalena Dragović et al.	
Hexagonal pavement with attractor based scaling and gradient	35
Aleksandar Lesmajster	
FE Pavilion	36
Uroš Antić	
About the Selection Committee	37

Curator's Foreword / PredgovorKustosa

Geometry, as one of the oldest scientific disciplines, has been immanent not only to building design, but also to numerous artistic and scientific achievements since ancient times. As a language which articulates space and form, it is a testament to intelligent thinking and one of the most lucid faculties of the human mind. As the root of aesthetic postulates, it is clearly recognized in the works of artists, architects, designers and engineers. Being the tongue of accuracy, regularity and precision, it is the foundation of many scientific solutions. And as an impetus to contemporary graphic disciplines, geometry is still ubiquitous in shaping and presenting the world around us. The exhibition **Dimensions Reflected** aims to show the importance of geometric mastery through contributions in various scientific, engineering, applied and artistic fields, as well as through upgrading this valuable base by means of modern digital techniques and technologies.

Emerged as a fruit of various studies, projects or individual endeavors, it testifies to enthusiasm and love for the topics related to manifestations of geometric principles in the material world. We can see new angles of observation and new approaches to creation of structures in space, architectural elements and wholes, mathematical models and concepts, artistically molded geometric elements and new approaches in shape design.

Also, the section dedicated to the education of young generations: Dimensions Reflected - Perspective, which brings together students and their professors in a joint mission, shows that geometry has worthy successors who will carry the spark of knowledge, without which many of the mentioned disciplines would be unimaginable.

Curator

Dr Marija Obradović, associate professor
Faculty of Civil Engineering, University of Belgrade

Excerpt from the Review / Iz recenzije

The 7th International Conference MoNGgeometrija 2020 is organized and supported by Serbian Society for Geometry and Graphics (SUGIG) and the Faculty of Mechanical Engineering, University of Belgrade. Since SUGIG considers geometry and graphics to be the universal languages of science, technics and all visual arts, the conference offers the wide range of topics which found their expression through the special Exhibition of ideas, designs and models under the name "Dimensions Reflected."

The Exhibition discloses and emphasizes the inspiring and fruitful influence of geometry on art, and at the same time the correlation between scientific exactness and poetics of visual arts. This Exhibition assures us that geometry is not only the seed and the core of many different branches of science and techniques, but also the root of aesthetic postulates, clearly recognizable in the works of artists, architects, and designers. Despite the fact that geometry is a primeval knowledge and wisdom, its power does not fade or vanish through the time, but increases its strength and authority through contemporary arts and crafts. Thus, the Exhibition exposes and confirms the importance of geometric comprehension through contributions in various scientific, engineering, and artistic fields, as well as through enhancing this precious base by means of modern digital techniques and technologies.

Finally, I would like to commend this exhibition of works of art, its participants and organizers, and recommend it to everyone, especially to those who study and appreciate geometry, visual arts and other areas of visual communication. I would like to encourage all organizers of the International Conference MoNGgeometrija to make such exhibitions as an indispensable part of their scientific meetings.

Dr Branislav Popkonstantinović, full professor
Faculty of Mechanical Engineering, University of Belgrade

Predgovor Kustosa / Curator's Foreword

Geometrija, kao jedna od najstarijih naučnih disciplina, imanentna je ne samo dizajnu zgrada, već i brojnim umetničkim i naučnim dostignućima od davnina. Kao jezik koji artikuliše prostor i formu, svedoči o inteligentnom promišljanju kao o jednoj od najlucidnijih sposobnosti ljudskog uma. Kao koren estetskih postulata, jasno je prepoznat u delima umetnika, arhitekata, dizajnera i inženjera. Budući da je jezik tačnosti, pravilnosti i preciznosti, ona je temelj mnogih naučnih rešenja. Kao podsticaj savremenim grafičkim disciplinama, geometrija je i dalje sveprisutna u oblikovanju i predstavljanju sveta oko nas. Izložba **Dimensions Reflected** pokazuje značaj geometrijskog majstorstva kroz doprinose u različitim naučnim, inženjerskim, primenjenim i umetničkim poljima, kao i nadogradnjom ove vredne osnove savremenim digitalnim tehnikama i tehnologijama. Nastao kao plod različitih studija, projekata ili pojedinačnih poduhvata, svedoči o entuzijazmu i ljubavi prema temama povezanim sa manifestacijama geometrijskih principa u materijalnom svetu. Možemo videti nove uglove posmatranja i nove pristupe stvaranju struktura u prostoru, arhitektonske elemente i celine, matematičke modele i koncepte, umetnički oblikovane geometrijske elemente i nove pristupe u dizajniranju oblika. Takođe, odeljak posvećen obrazovanju mladih generacija: **Dimensions Reflected - Perspective**, koji okuplja studente i njihove profesore u zajedničkoj misiji, pokazuje da geometrija ima dostojne naslednike koji će nositi iskru znanja, bez koje bi mnoge od pomenutih disciplina bile nezamislive.

Kustos

Dr Marija Obradović, vanredni profesor

Građevinski fakultet Univerziteta u Beogradu

Iz recenzije / Excerpt from the Review

Sedmu međunarodnu konferenciju MoNGgeometrija 2020 organizuju i podržavaju Srpsko društvo za geometriju i grafiku (SUGIG) i Mašinski fakultet Univerziteta u Beogradu. Budući da SUGIG geometriju i grafiku smatra univerzalnim jezicima nauke, tehnike i svih vizuelnih umetnosti, konferencija nudi široki spektar tema koje su pronašle svoj izraz kroz posebnu Izložbu ideja, dizajna i modela pod nazivom „**Dimensions Reflected**“.

Izložba otkriva i naglašava inspirativni i plodonosni uticaj geometrije na umetnost, a istovremeno i korelaciju naučne tačnosti i poetike vizuelnih umetnosti. Ova izložba nas uverava da geometrija nije samo tematika i srž mnogih različitih grana nauke i tehnika, već i koren estetskih postulata, jasno prepoznatljivih u delima umetnika, arhitekata i dizajnera. Uprkos činjenici da je geometrija iskonsko znanje i mudrost, njena snaga ne bleđi niti nestaje kroz vreme, već povećava svoju snagu i autoritet kroz savremene umetnosti i zanate. Tako izložba izlaže i potvrđuje važnost geometrijskog razumevanja kroz doprinose u raznim naučnim, inženjerskim i umetničkim poljima, kao i kroz unapređenje ovog dragocenog bejzbonskog sredstva savremenih digitalnih tehnika i tehnologija.

Na kraju, želeo bih da pohvalim ovu izložbu umetničkih dela, učesnike i organizatore i preporučim je svima, posebno onima koji proučavaju i cene geometriju, vizuelne umetnosti i druga područja vizuelne komunikacije. Želeo bih da podstaknem sve

organizatore Međunarodne konferencije MoNGgeometrija da takve izložbe postanu nezamenljivi deo njihovih naučnih sastanaka.

Recenzent

Dr Branislav Popkonstantinović, redovni profesor

Mašinski fakultet Univerziteta u Beogradu

Dimensions Reflected

Main Category / Glavna kategorija

TriX Modular Toy

TriX connectable toy is a source of creativity inspired by natural growth patterns. The project started during doctoral studies in the Natural Structures and Analogies course at the Faculty of Applied Arts in Belgrade.

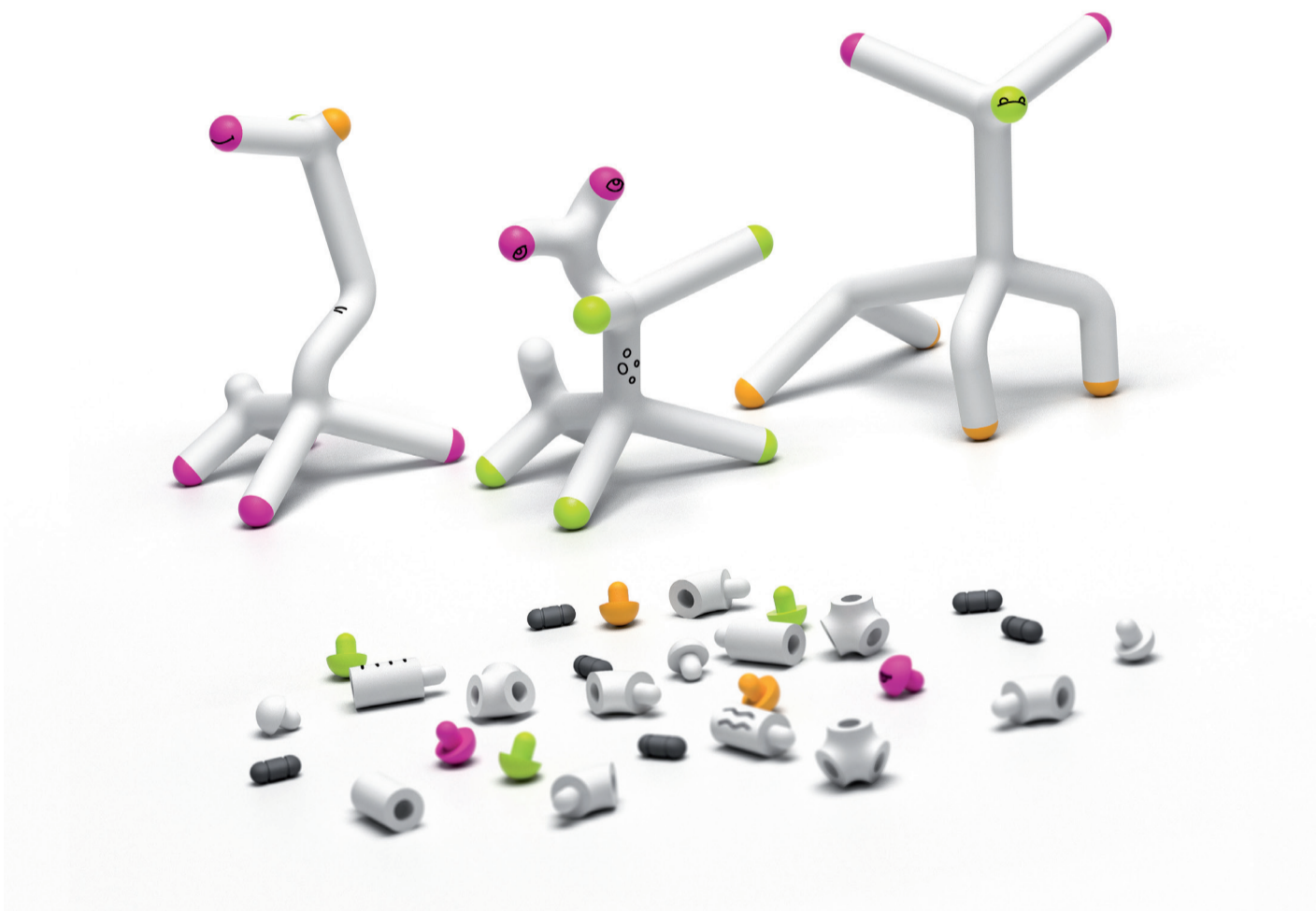
The basis of the concept is found in a hexagonal 3D grid derived from four axes of a tetrahedron. Using this principle, exploration of the form is possible in any direction, while simple and versatile parts allow various possibilities of expression. The toy can contribute to the development of spatial thinking and motor skills, while the small number of parts stimulates creativity.

The concept is designed around six elements, which utilize a selected number of axes in the grid. Parts can be used to learn existing forms, explore complex patterns, or create new characters, while ambiguous symbols assist the child in expressing emotions.

Combining and rotating these parts around their axes, while utilizing simple graphics, brings different connotations depending on rotation and placement. This encourages interaction between youngsters and helps develop social skills when used within a group.

AUTHOR

Vladimir Zagorac



ABOUT THE AUTHOR

Vladimir Zagorac is an Assistant professor at the Faculty of Applied arts in Belgrade.

Mentors on the project: Asst. Prof. Tijana Sekulić (Faculty of Applied Arts, Belgrade), Prof. Dušan Nešić (Faculty of Applied Arts, Belgrade)



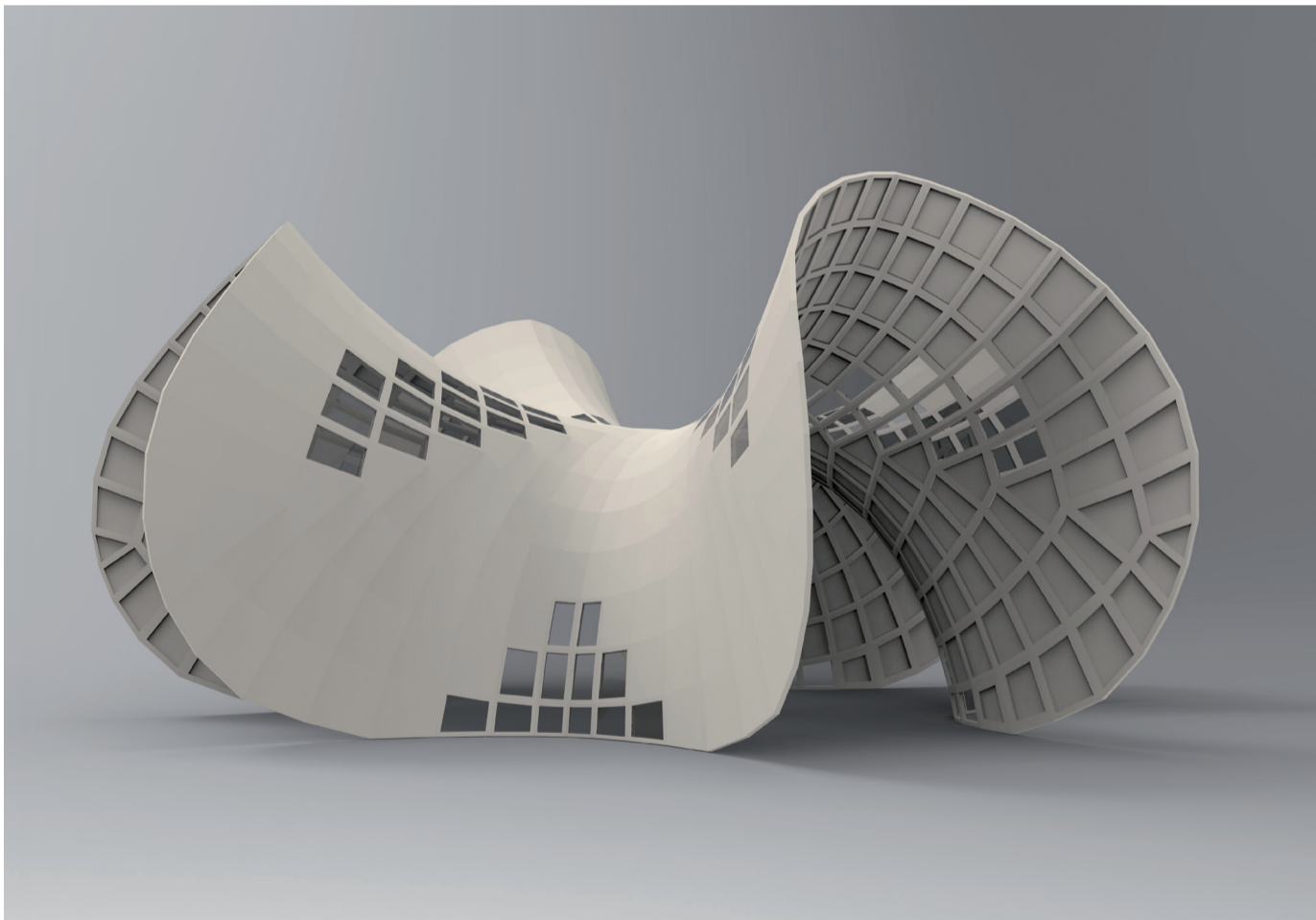
vlada.zagorac@gmail.com

Free-form Circular Mesh System for Concrete 3D Printing

Shell-like, double curved and thus above-average performance structures, are usually produced monolithically on site. For industrial advancement, however, they must be divided into transportable modules which can be assembled on the construction site (design for assembly). Models are lattice shells made of steel and glass, in which predominantly flat sub-surfaces (modules) are used. Therefore, the main question is: Which modularizations are suitable for flow production with mineral building materials? This model represents free-form surface generated from two curves. The surface is generated with geometry PQ circular mesh systems method, that has multiple construction and geometry benefits for free-form surface discretization. The principal curvature lines, which define direction of the circular mesh edges, allow for a supporting edge layout with optimal node (placement of vertices in the modular shell) properties. Moreover, the offset mesh property brings a few advantages when it comes to individual elements but also overall structure. One of the biggest problems is the geometric torsion in the edges that has large influence on the production of the connections (nodes) with rectangular cross sections that can be minimized here. Finally, as the elements are flat, the production process creates suitable modules for 3D concrete printing.

AUTHORS

Zlata Tošić, Martin Friedrich Eichenauer, Daniel Lordick, Sonja Krasić



ABOUT THE AUTHOR

Zlata Tošić PhD is a student and researcher at the Faculty of Civil Engineering and Architecture, University of Niš, Serbia.
Martin Friedrich Eichenauer, Geometric Modeling and Visualization (GMV), Institute of Geometry, TU Dresden, Germany.
Daniel Lordick, Prof. Dr.-Ing., is the head of the research group GMV, Germany.
Dr Sonja Krasić is an associate Professor at he Faculty of Civil Engineering and Architecture, University of Niš, Serbia.



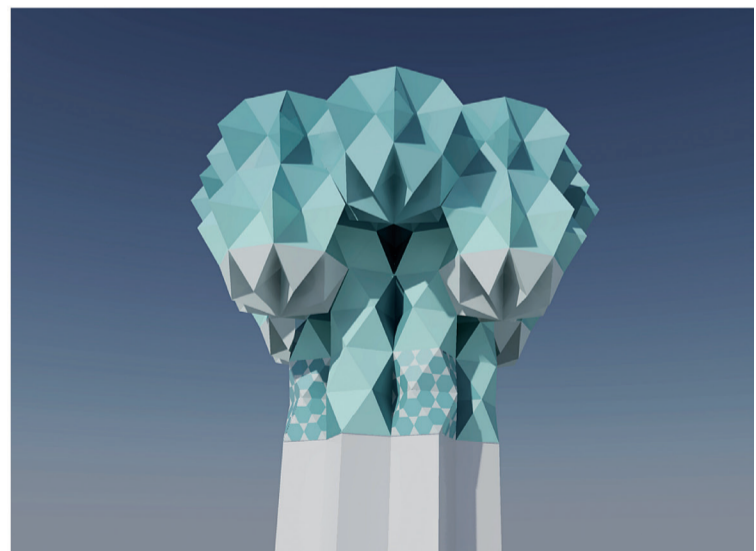
zлата10@live.com

Deltahedral Column Capitals

Concave polyhedra of the second sort is a common name for polyhedra whose lateral surface is deltahedral, composed of a double row of equilateral triangles arranged in a $2n$ polar array over a regular polygonal base. Using representatives with an octagonal base, which have the greatest potential for modular fitting, we assemble complex shapes that can be applied as design solutions to architectural details. The column capitals are formed by a combination of the lateral deltahedral surfaces of the flower antiprisms (FA-II-8m), which serve as the backbone of the whole composition, concave antiprisms (CA-II-8M) and concave pyramids (CP-II-8m) of the second sort. By different arrangement of these elements, as well as by using different materials and colors, various ornate solutions can be obtained. Some of them are presented as suggested solutions. By combining different techniques of finishing the triangular faces of these deltahedral surfaces, whether in different materials, colors or in patterns obtained by face subdivisions, various decorative effects can be achieved, which can further enrich the appearance of both the capitals and the columns themselves.

AUTHOR

Marija Obradović



ABOUT THE AUTHOR

Dr Marija Obradović, dipl. ing. arch. is an associate professor at the Faculty of civil engineering, University of Belgrade, Serbia.



marijao@grf.bg.ac.rs

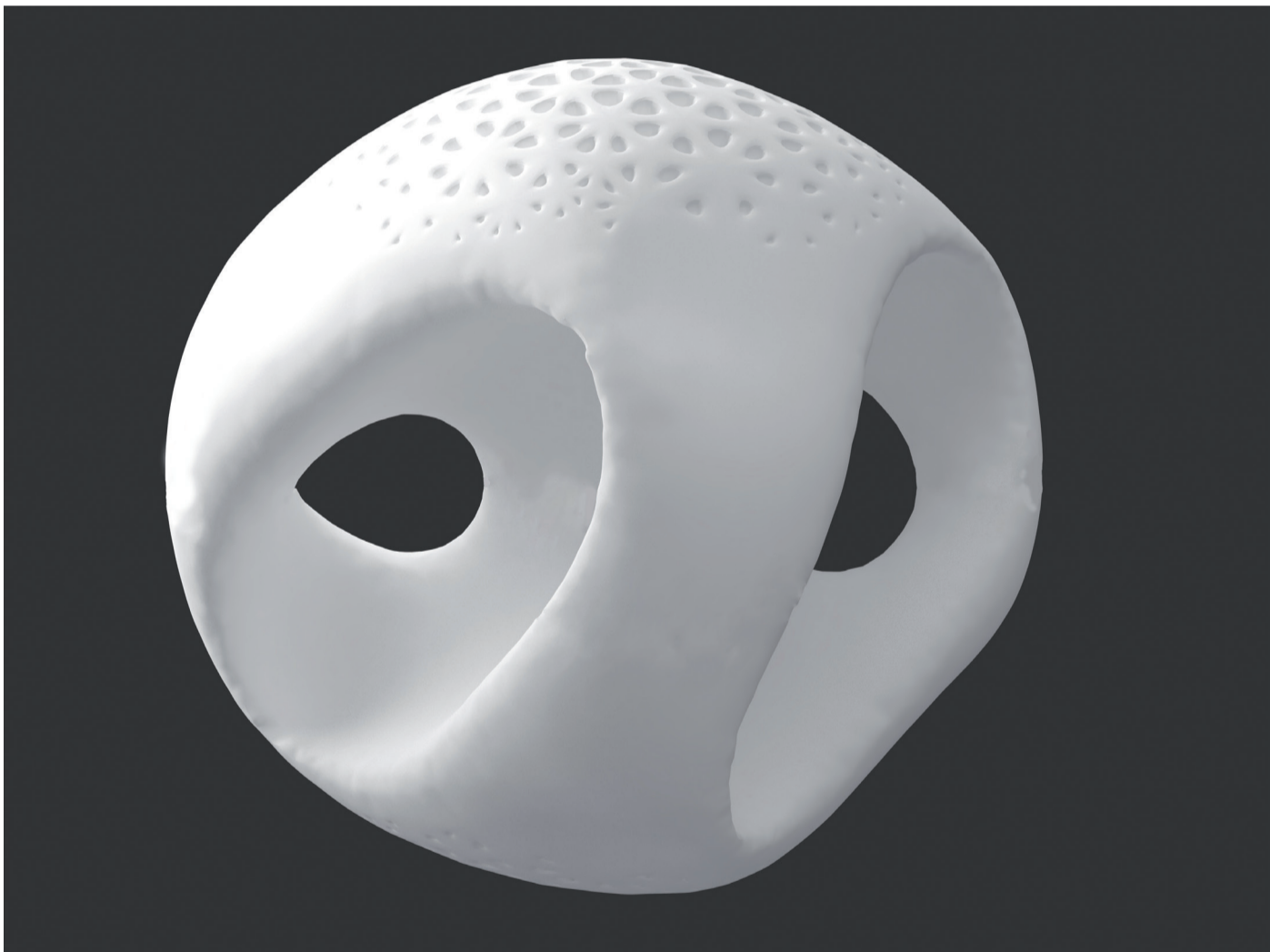
Weberian Focal-directorial Surface of Cassini's Type

Weberian focal-directorial surface of Cassini's type - WFDS of Cassini's type - represents a spatial locus of points whose sum of scaled product distance to m fixed points - foci and the scaled product distance to n fixed directrices is constant (S).

In this instance, the desired WFDS of Cassini's type is generated by eight foci and four directrices. This surface is depicted as a spatial locus of points where the product of the distances to the eight foci is equal to the scaled product distance to the four directrices. The foci are the vertices of the cube, while the directrices are the skewed lines depicting the diagonals of the four vertical cube sides. The scaling factor is appropriately predefined and the constant S is set to zero.

AUTHORS

Marko Vučić, Marko Jovanović, Maja Petrović, Radovan Štulić, Branko Malešević



ABOUT THE AUTHORS

Marko Vučić is a teaching assistant, and Marko Jovanović PhD is an assistant professor at the University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia.

Dr Maja Petrović is an assistant professor at the University of Belgrade, Faculty of Transport and Traffic Engineering, Belgrade, Serbia.

Dr Radovan Štulić is a full professor at the University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia.

Dr Branko Malešević is a full professor at the University of Belgrade, Faculty of Electrical Engineering, Belgrade, Serbia.



vucic.marko@uns.ac.rs

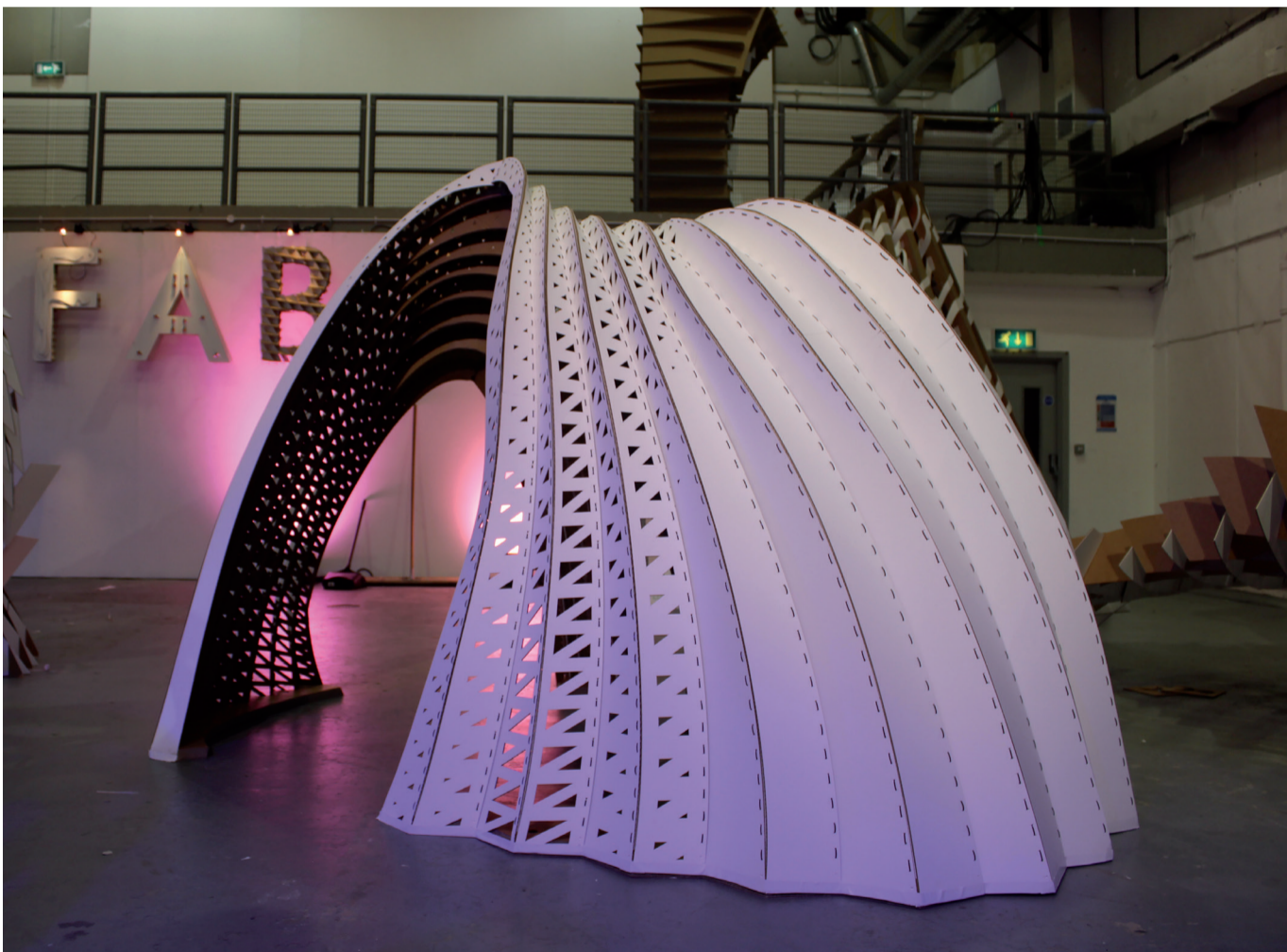
Clamshell pavilion

Nowadays, in contemporary architecture, people are constantly attempting to design thinner structures. Owing to modern designing and modelling software, today it is possible to create such forms that were almost impossible to build in the past. However, lighter freeform structures demand new structural solutions.

The aim of this project is to design a lightweight structure, utilizing widely available and affordable sheet materials. Seeking the inspiration for structural and constructive behavior, various projects in the past used biomimetic principles. Natural organisms, improved by evolution for millions of years, as well as their structure and mechanism are one of the most common sources today. Sea clamshell has a shell that is rugous, which allows it to have a thin wall. This example can serve as a good inspiration for designing the desired structure. Utilizing parametric modelling, we applied the principle of a Clamshell on the structure of the pavilion. The pavilion is firm, enduring and it does not require big material consumption, which was tested on a real scale model made out of cardboard strips connected with zip ties.

AUTHORS

Marko Vučić, Emeše B. Varga, Teodora Nikolić, Ivana Beatović, Ksenija Martić, Radmila Đurašinić, Jelena Vujović



ABOUT THE AUTHORS

Marko Vučić is a teaching assistant, and Emeše B. Varga, Teodora Nikolić, Ivana Beatović, Ksenija Martić, Radmila Đurašinić and Jelena Vujović are students at the University of Novi Sad, Faculty of Technical Sciences, Department of Architecture and Urban planning, Serbia.



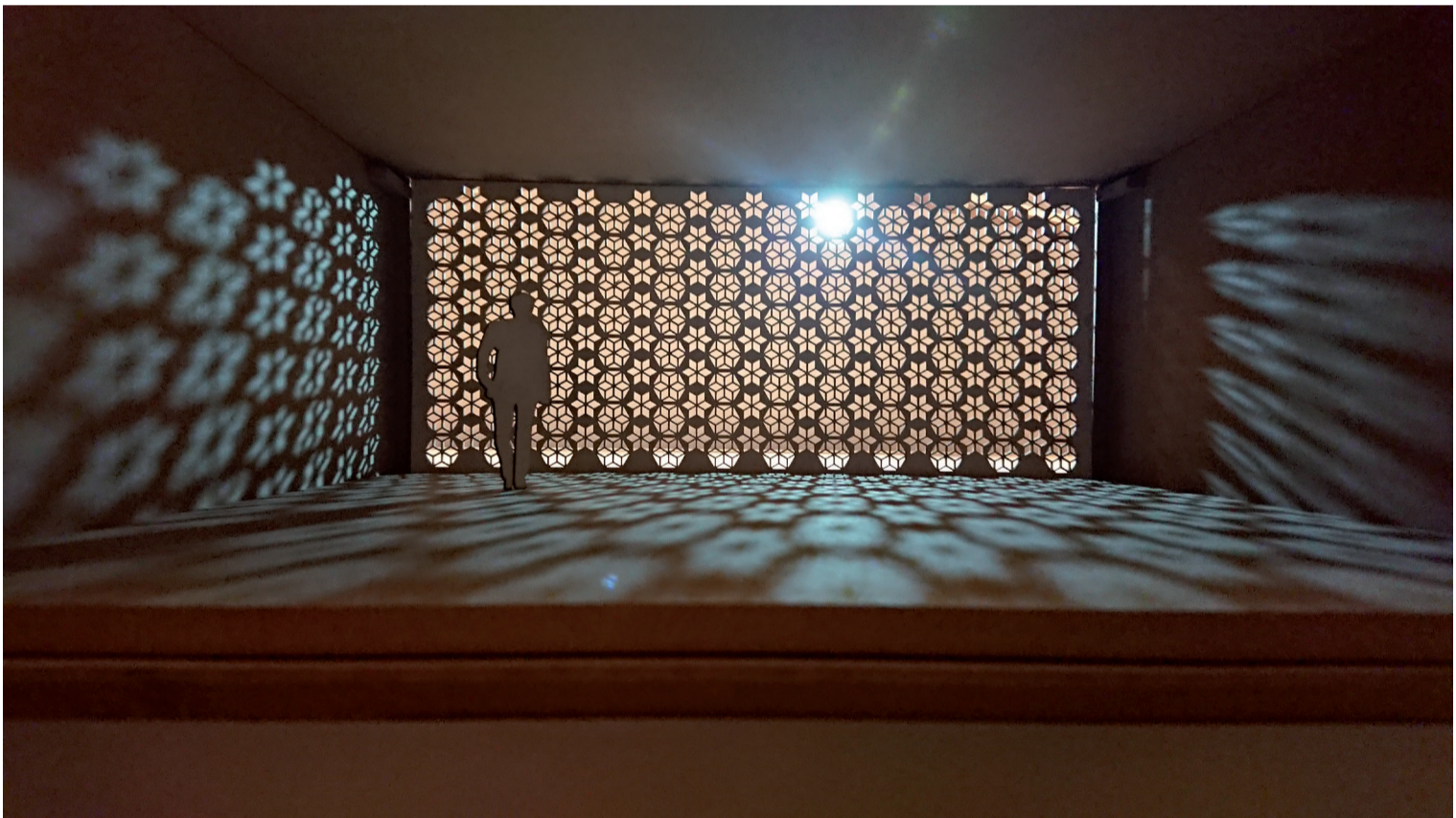
vucic.marko@uns.ac.rs

Perforated Panel for Daylighting Control

In order to solve issues caused by glass facades, architects created passive and active shading systems. Most of the existing active shading systems are powered by electrical and operated via mechanical drive, which requires a lot of energy and money. In order to achieve more energy-efficient and cost-effective solution, in this research a passive facade system, i.e. perforated panel is suggested. This research is concentrated on designing and calculating the efficiency of an optimal perforated panel that minimizes direct sunlight. The analysis of the perforated panel efficiency is conducted on the scale model, by observing different variations of shadows. Different variations are achieved by changing three parameters. Firstly, by moving the sun path under certain angles, every position of the sun represents a different season of the year. Secondly, moving the light source across the sun path shows the position of the sun during the day. Thirdly, in order to achieve diffuse light, one of the perforated panels is movable, while the other is fixed, letting the sunlight in the room under different angles, resulting in diverse shadows.

AUTHORS

Nikoleta Stamenković,
Marko Jovanović



ABOUT THE AUTHORS

Nikoleta Stamenković is a student, and Marko Jovanović, PhD is an assistant professor at Faculty of Technical Sciences, Novi Sad, Serbia.



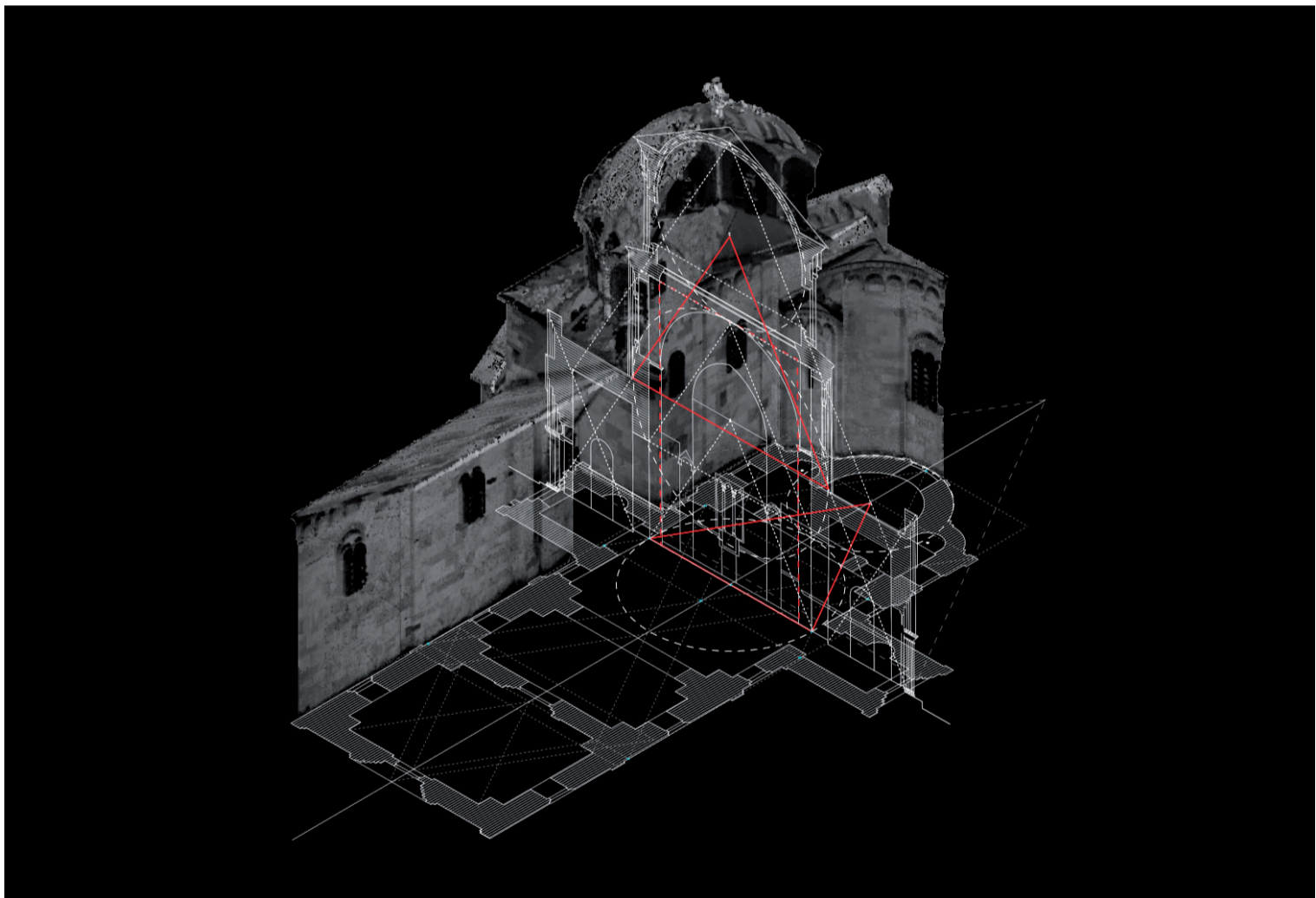
nikoleta.nina.stamenkovic@gmail.com

Parametric Modeling of the Church in Studenica

This project reveals surveying data and architectural design of the major church in the Studenica monastery complex in Serbia reflected in a variety of 3D models and the analysis of the church interior and exterior. Architecture-driven computational parametric modeling was done by using two types of data: close range photogrammetry and high precision laser scanning. The modeling, based on geometric parameters and other planimetric and volumetric analysis, is devised during the four-year study as part of the project Parametric Research of the Studenica Church, a UNESCO Heritage Site, as a Model for Advanced Studies of Medieval Architecture. These models allow for better understanding and representation of the proportional, aesthetic and illumination qualities of the Studenica church and for prototyping procedures for examining other medieval domed churches where we lack more detailed references about their architectural design.

AUTHORS

Jelena Bogdanović, Magdalena Dragović, Aleksandar Čučaković, Marko Pejić, Leslie Forehand, Dušan Danilović, Charles Kerton, Zoran Stević, Travis Yeager, Jacob Gasper, Anastasija Martinenko



ABOUT THE AUTHORS

The group of authors is affiliated to the three scholar institutions involved in the project:

- Iowa State University, Iowa, USA
- University of Belgrade, Serbia
- Long Beach City College, Los Angeles, California, USA.



jelenab@iastate.edu
<http://studenica.design.iastate.edu/>

Design of the Realized Solar Race Car Emilia 4, for the National Italian Team Onda Solare

Emilia 4, a solar car from the University of Bologna produced by the Italian national team Onda Solare won first place in the famous American Solar Challenge competition in July 2018, a competition reserved for solar vehicles developed at universities around the world. The success is even greater since it was also the first participation in one of the world competitions. The four-seater "cruiser" Emilia 4 is 4.6 meters long, 1.8 wide, 1.2 high, and its aerodynamic carbon body is covered with 5 square meters of highly efficient photovoltaic solar panels with a total of 362 silicon cells and a nominal power of 1200W. Emilia 4 can carry a maximum of 4 people and 4 pieces of luggage and has the average cruising speed of 70-80 km. It has a driving autonomy of about 600 km, which is a record in the sector of ecological "green" mobility.

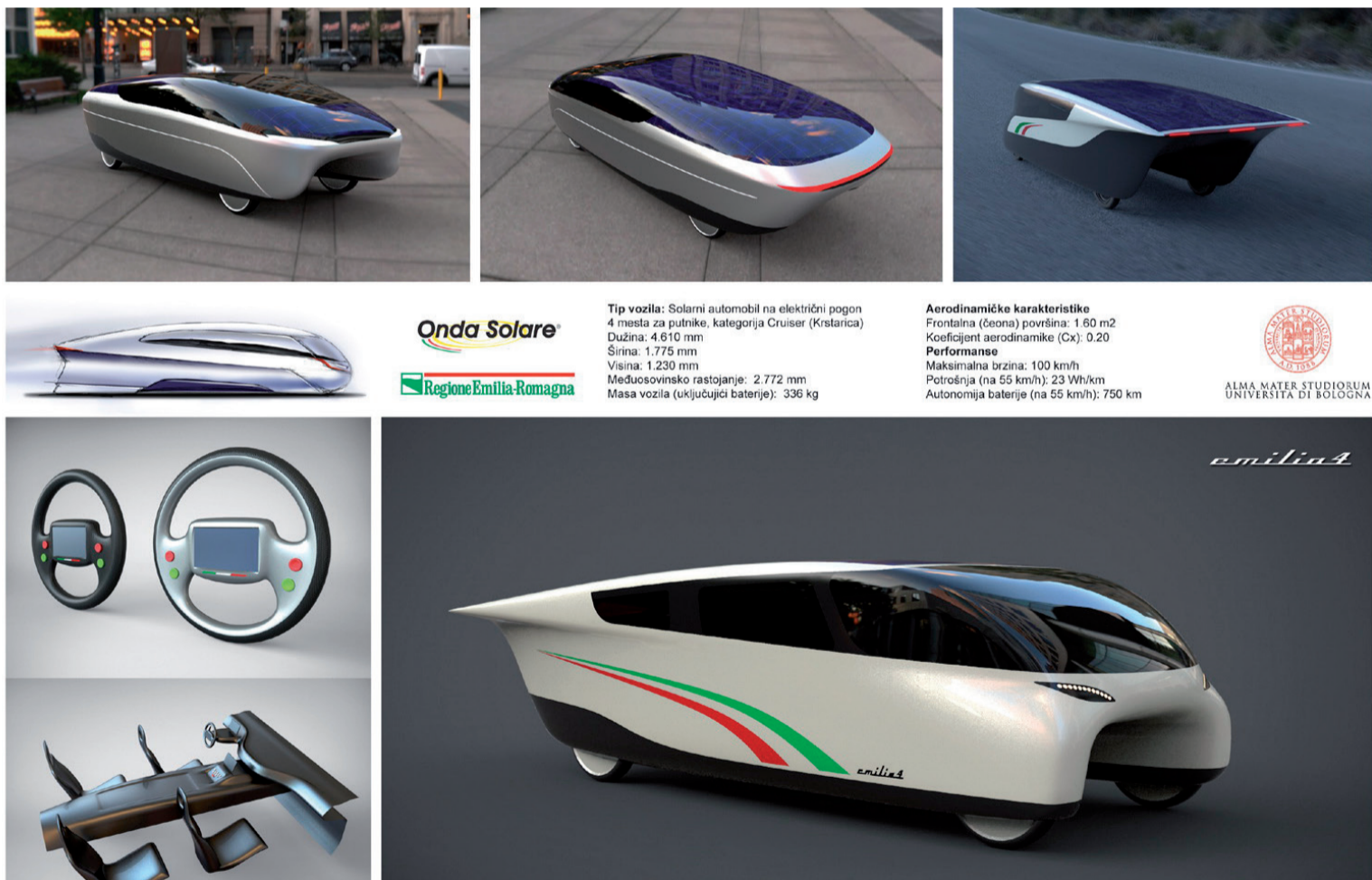
The Emilia 4 project includes design research into the exterior shape and elements of the car's interior. Marko Luković's research process included an artistic and creative part, as well as an experimental part using scientific methods of validation and optimization of many conceptual solutions and directions, all using specialized computer software for three-dimensional design (3D CAD) and numerical aerodynamic simulation - Computational fluid dynamics (CFD) simulation.

The world premiere of the solar car Emilia 4 was at the Ferrari Museum in Miranelli, Italy, 2018.

Emilia 4 was awarded for the design by the ULUPUDS, at the annual May exhibition 2019.

AUTHOR

Marko Luković



ABOUT THE AUTHOR

Marko Luković is an associate professor at the Faculty of Applied Arts, University of Arts, Belgrade, Serbia.



marko-design@hotmail.com
www.marko-design.com

Cardboard Design CARTORAMA

CARTORAMA - Cardboard design, is creative task in exploration of geometrical forms and structures. By practicing on paper and cardboard models students explore the laws of structural and constructional principles as a starting point in analytical approach towards resolving concrete problems and innovate solutions in furniture design as means of initiating the creative process.

Project was part of a semestral assignment within the furniture design courses in second, third and fourth year of bachelor studies at Department of Interior and Furniture Design at Faculty of Applied Arts, University of Arts, Belgrade.

AUTHORS

Students:

Marija Peševski, Nina Vučak, Iskra Race, Ivana Mitrović, Luna Petrović, Veljko Nikšić, Isidora Stojanović, Irena Milović, Milena Suzić, Una Kršev, Pavle Jovanović, Ljupka Bojović, Valerija Vrančić

MENTORS:

Ranko Bočina, Tijana Sekulić, Mladen Vračević



ABOUT THE AUTHORS

The group of 13 students who took part in this project are attendants of 2nd, 3rd and 4th year of the Faculty of fine Arts (university of Arts, Belgrade).

Their mentors are:

Ranko Bončina, full professor, Tijana Sekulić, associate professor and Mladen Vračević assistant professor are all affiliated to the Department of Interior and furniture design, Faculty of Applied Arts (University of Arts Belgrade), Serbia.



ranko.bocina@fpu.bg.ac.rs
tijana.sekulic@fpu.bg.ac.rs

4- and 5-dimensional Regular Solids Move in the Computer 2-screen with Visibility Effects

In previous works (see [1], [2], [3]) the authors extended the method of central projection to higher dimensions, namely, for $E_4 \rightarrow E_2$ projection from a one dimensional centre figure, together with a natural visibility algorithm. All these are presented in the linear algebraic machinery of real projective sphere PS_4 or projective space $P_4(V_5, V_5, \sim)$.

In this presentation we further develop this method for $E_5 \rightarrow E_2$ projection by the exterior (Grassmann – Clifford type) algebra (with scalar product) and implement on computer with other effects of illumination, e.g. for (regular and maybe other nice) polytopes on the base of the homepage:

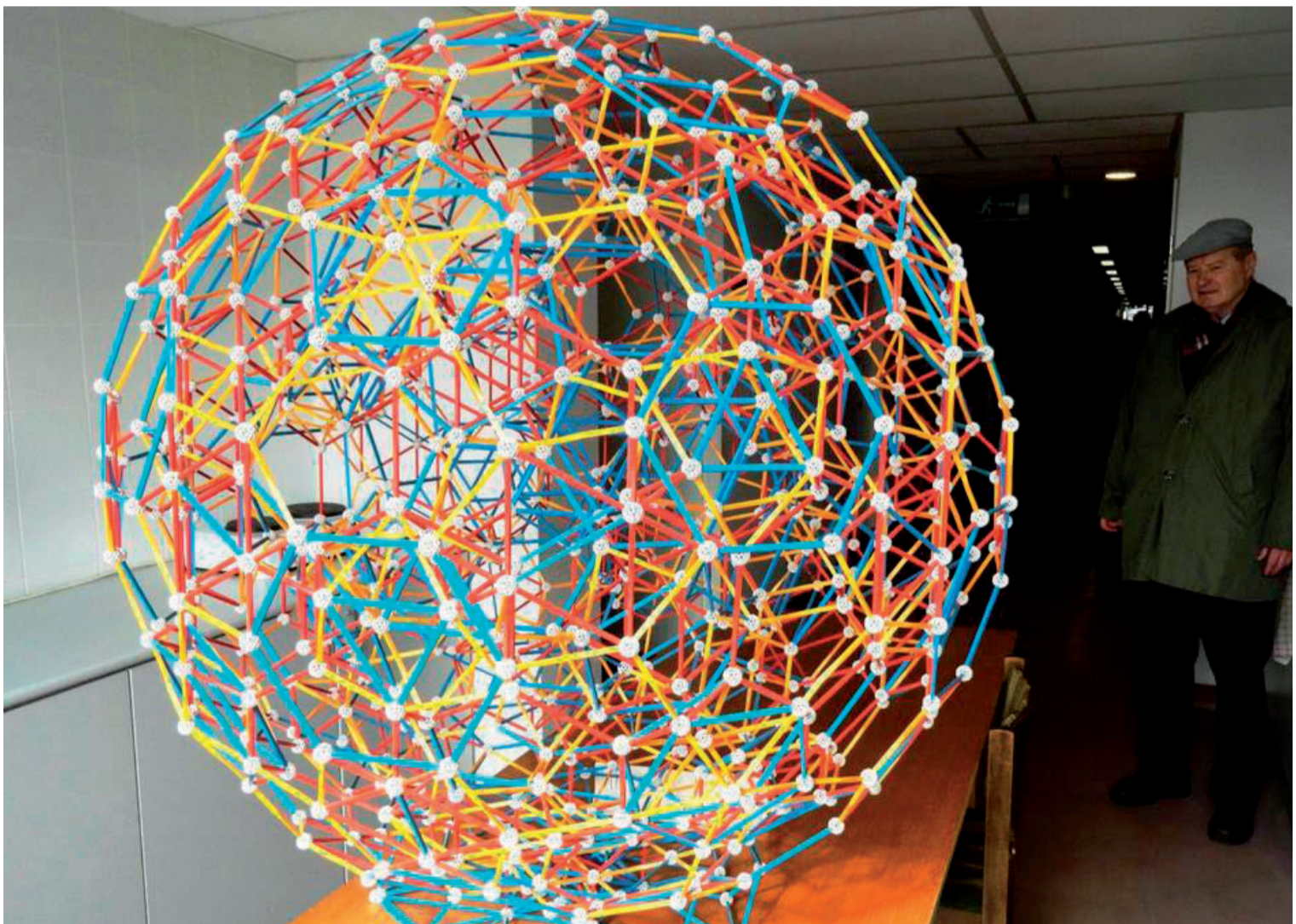
<http://www.math.bme.hu/~prok>

The machinery is applicable for any d -dimensional projective space P_d and p -dimensional image.

AUTHORS

Emil Molnar, István PROK, Jenő SZIRMAI

Photograph by Mihály HUJTER



ABOUT THE AUTHORS

The authors are professors affiliated to the Budapest University of Technology and Economics, Institute of Mathematics, Department of Geometry, Budapest, Hungary.



emolnar@math.bme.hu

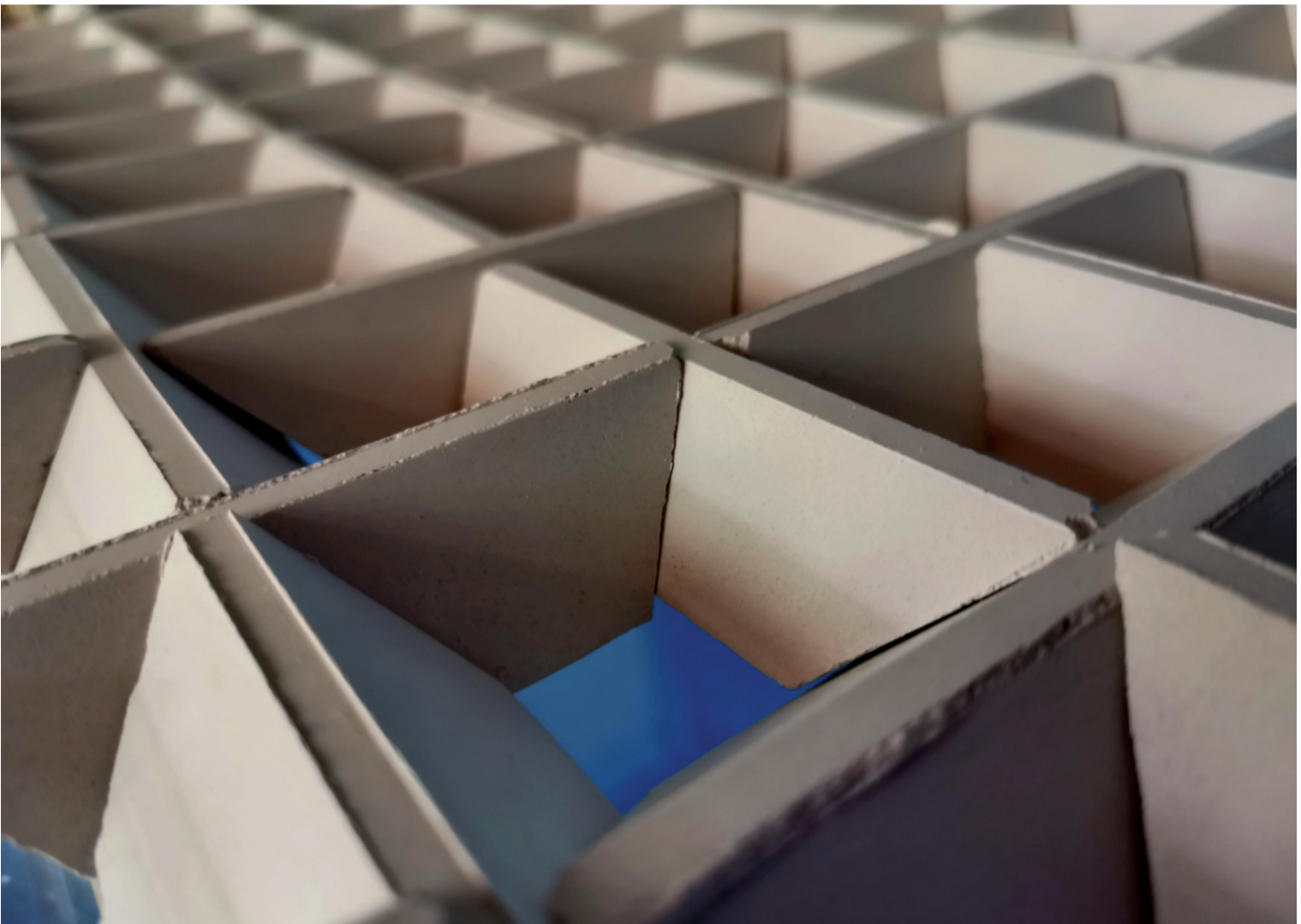
<http://www.math.bme.hu/~prok>

Parametric Model of a Rectangular Flat Vault

Unlike the usual shape of vaulted structures, planar vaults, known as flat vaults, are formed out of voussoirs cut in a specific way, which combines the material properties and the needed geometrical, i.e. structural logic. Thus, the shape of adjacent voussoirs enables their mutual interlocking. In this research, the analysis of the flat vault shape and its fundamental elements is conducted. Accordingly, the physical model of a vault is digitally fabricated. Using 3D printer, individual elements were produced, together with the needed supporting frame, and afterwards assembled, forming the flat vault without the use of any kind of bonding agents.

AUTHORS

Teodora Nikolić, Dimitrije Nikolić, Marko Jovanović, Vesna Stojaković



ABOUT THE AUTHORS

Teodora Nikolić is a B. arch, master student, Dimitrije Nikolić, PhD is a senior teaching assistant, Marko Jovanović is an assistant professor, and Vesna Stojaković is an associate professor, all affiliated to the Faculty of Technical Sciences, University of Novi Sad, Serbia.



niktea96@gmail.com

The Building Phases of Cologne Cathedral and its Predecessors (with a Special on Inner Choir 1856)

The two films show the current research results on the building phases of Cologne Cathedrals and its predecessors. From a water basin in a Roman garden, several churches have been built for about two thousand years, until the Gothic choir was started in mid-13th century.

Completed at the end of the 19th century, the cathedral was given a new access structure ten years ago, which serves as an entrance to the tower ascent as well as to the archaeological zone, and in which the film about the construction phases is since exhibited.

It was only in the middle of the 19th century that the wall that had closed off the Gothic choir to the west since the 14th century was removed. From this period numerous images of the interior have been preserved, but none of them show the central interior. The 150th anniversary of the cathedral chorus provided the opportunity to recapture this.

Both visualizations translate scientific hypotheses. They have only been supplemented in those places where it was necessary to complete the architectural impression. As a result, the buildings appear abstract and only in the imaginative power of the observer do they become architecture again.

AUTHORS

Dominik Lengyel, Catherine Toulouse



ABOUT THE AUTHORS

The authors are affiliated to the BTU University of Technology Cottbus-Senftenberg, Cottbus, Germany.



lengyel@b-tu.de; toulouse@b-tu.de
<https://www.b-tu.de/fg-architektur-und-visualisierung/>

Phantasms

Phantasms, simulation of utopian landscapes using the method of augment reality

The project explores the interrelation between the real, material nature and virtual nature in the field of fine arts and digital arts.

Nature has been viewed through the dominant discourse of dualism. In the general sense, this term represents the idea that for a given domain, there are two fundamental categories of elements or principles that describe that domain. Dualism is established as the dominant principle of organization and perception of the world and enables parallel analysis of two irreducible categories of reality.

As equivalent to the philosophical concept of dualism, duality in media of expression was established: painting and digital model. Modernist concept of art and image, in which the color plays a dominant role are postmodern interpretation of the nature in the era of new technologies.

The result of the project is symbiosis of the real and virtual space, blended as one. The subject of research is the perception of nature in the era of new media and technology and simulation of utopian landscape.

Steps in the perception of the work:

Picture, image of real nature → "AR-gardens", an application for android devices → Augment reality, image of imaginary nature → Interactive audience perceptions



Phantasms, oil on canvas, 150 x 200 cm, 2019

AUTHOR

Miljan Stevanović

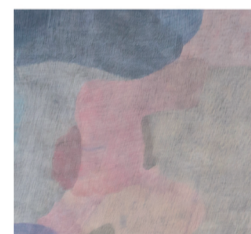


AR - gardens

application for Android devices



scan the image, and wait a few moments for the 3d model to appear



explore the content of Virtual reality

ABOUT THE AUTHOR

Miljan Stevanović is a PhD student at the Faculty of Fine Arts in Belgrade, University of arts, Belgrade Serbia.



miljanstevanovic91@gmail.com

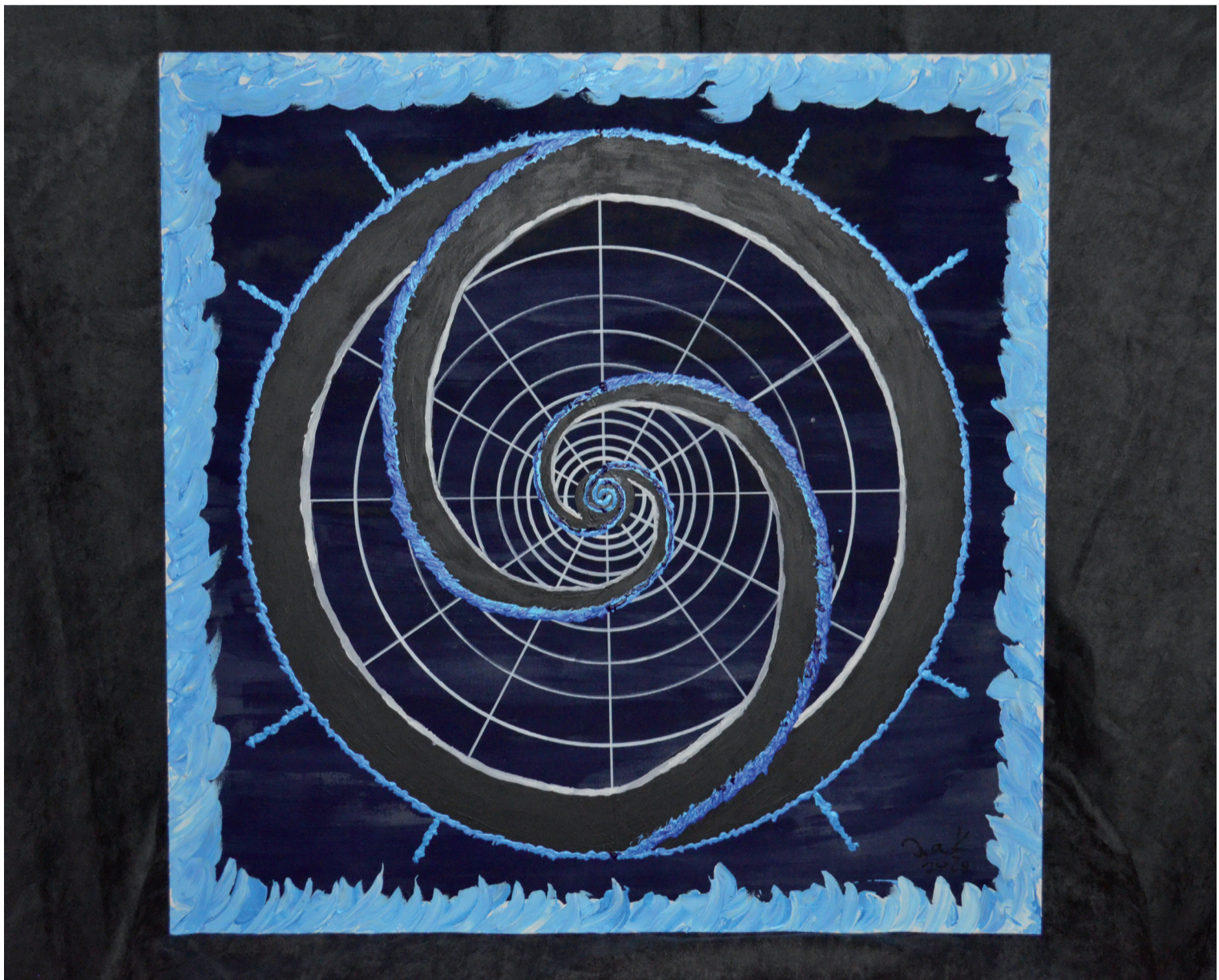
Spiraling Sea

When a ship sails in one oblique direction different from either straight east or west, it is sailing along a rhumb, also called a loxodrome which is a spherical curve and if the direction remains constant, the ship eventually arrives to the pole. The rhumb passes each spherical coordinate curve at the same angle.

In the painting "Spiraling Sea", acrylic painting on an HDF board, we see two logarithmic spirals on a polar coordinate system. This planar image is a depiction of the stereographic projection of a rhumb on a sphere, where both poles are located at the center of the polar system.

AUTHOR

Iva Kodrnja



ABOUT THE AUTHOR

Iva Kodrnja is a teaching assistant at Department for Mathematics, Faculty of Civil Engineering, University of Zagreb, Croatia.



iva.kodrnja@geof.unizg.hr

Dimensions Reflected-Perspective- Students and Educational Category / Studentska i edukativna kategorija

(Word + Flood) x 164

Pavilion designed and built by 15 students lead by professor Kazmy Chi, from the University of Monterrey of the Interior Design Department.

The design principle is based on the study and experimentation of the study prototypes made from flexible modules defined only by their edges and articulated in their vertices, the idea it is to give the possibility to transform and experiment until the design its defined.

To create the concept we used computer random word generator, where we asked it to give us an article a verb and a number, the result was as an object: word, as a verb: flow and as a number: 164.

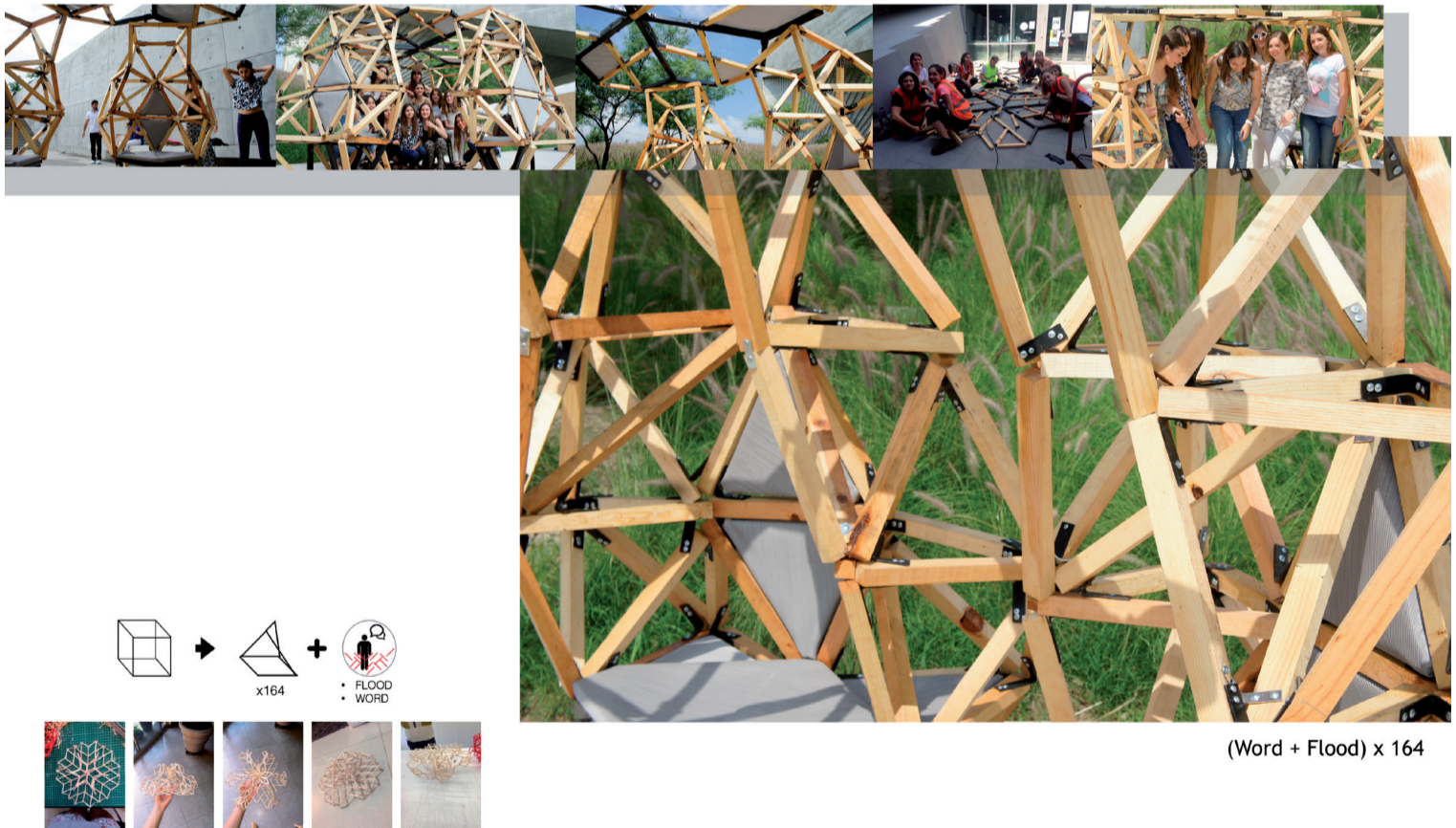
With these variables, the group designed a pavilion defined by a modular system of 164 modules, in a shape that allows the user to have a conversation and that by its geometry gives you the feeling to be flooding the people inside.

For the construction we put a special emphasis on the structure as well on the size of the parts of the modules so they were easy to be assembled and easily moved.

The pavilion was placed at the open atrium of the university for a month where students and anyone that was passing by could use it. Later on we donated to a design symposium where it was used for people to sit down to talk on their cellphones.

AUTHOR

Kazmy Chi Muñoz



ABOUT THE AUTHOR

Kazmy Chi Muñoz Arch (Udem) M.Arch (UIC) is a profesor at the Department of Architecture and Habitat Sciences, Universidad de Monterrey, Monterrey, Mexico.



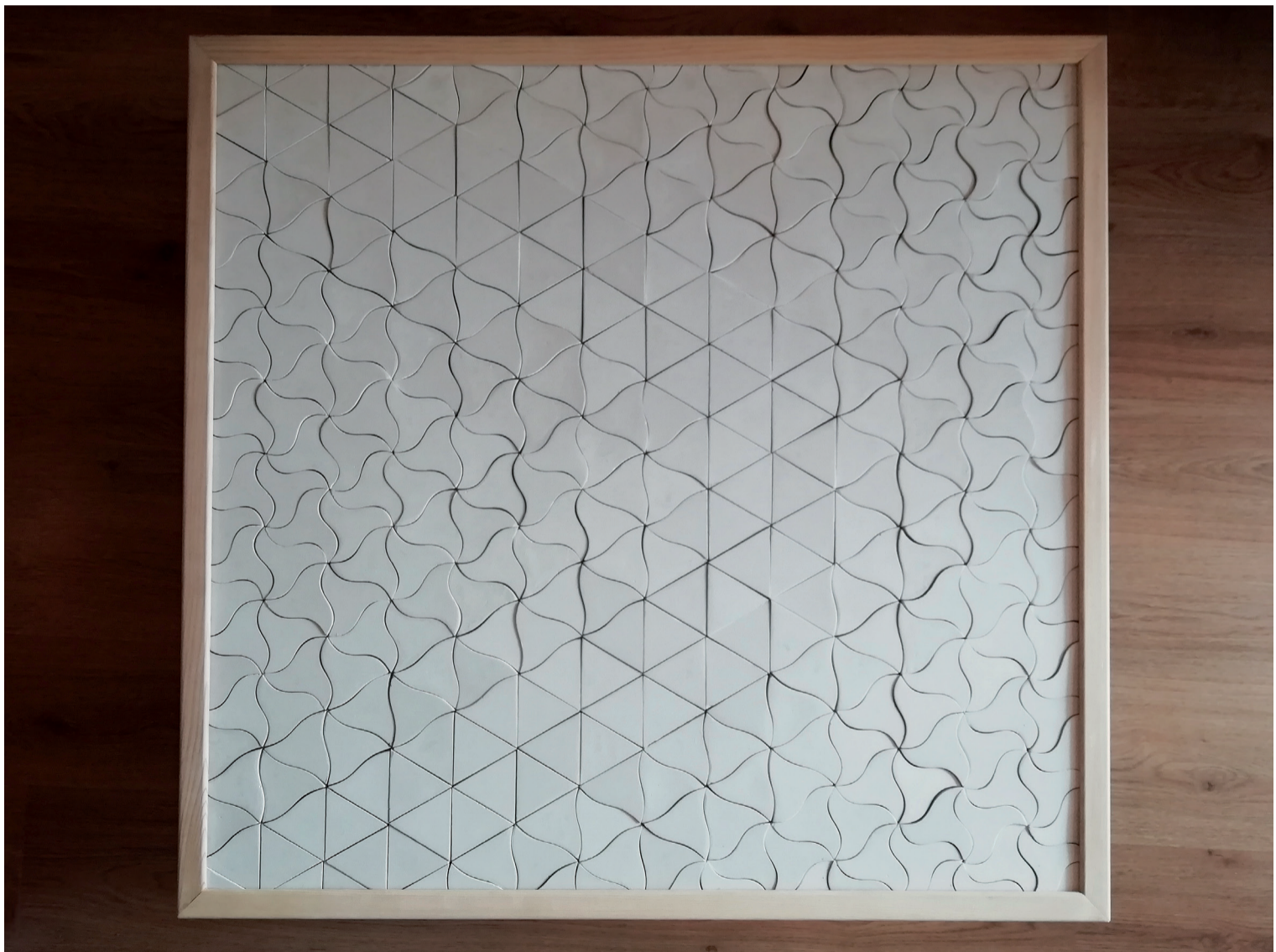
kazmy.chi@udem.edu

Planar Morphing Tessellation

The design concept was based on triangular shaped tiles where the edges morph into a curved shape created by rotating the curves around the centre-point of each side of the triangle. By generating a parametric model, the possibility for creating quick design variations was introduced by adjusting the shape of the edges through predetermined parameters. The final design consisted of ten different tile shapes, each of which would require a separate mould. However, by developing a mould with walls that can be adjusted i.e. bent according to a predetermined template, it was possible to fabricate all of the different shapes in plaster. The final result took the form of a physical model of the chosen tessellation design with 336 plaster tiles produced with the adjustable mould. This demonstrates the possibility of incorporating interesting and more dynamic, but seemingly complicated designs in interior and exterior tiling along with an efficient fabrication process.

AUTHORS

Radmila Đurašinović, Marko Jovanović



ABOUT THE AUTHORS

Ramila Đurašinović is a B.Arch, master student at the Faculty of Technical Sciences, University of Novi Sad, Serbia.
Marko Jovanović is an assistant professor at the Faculty of Technical Sciences, University of Novi Sad, Serbia..



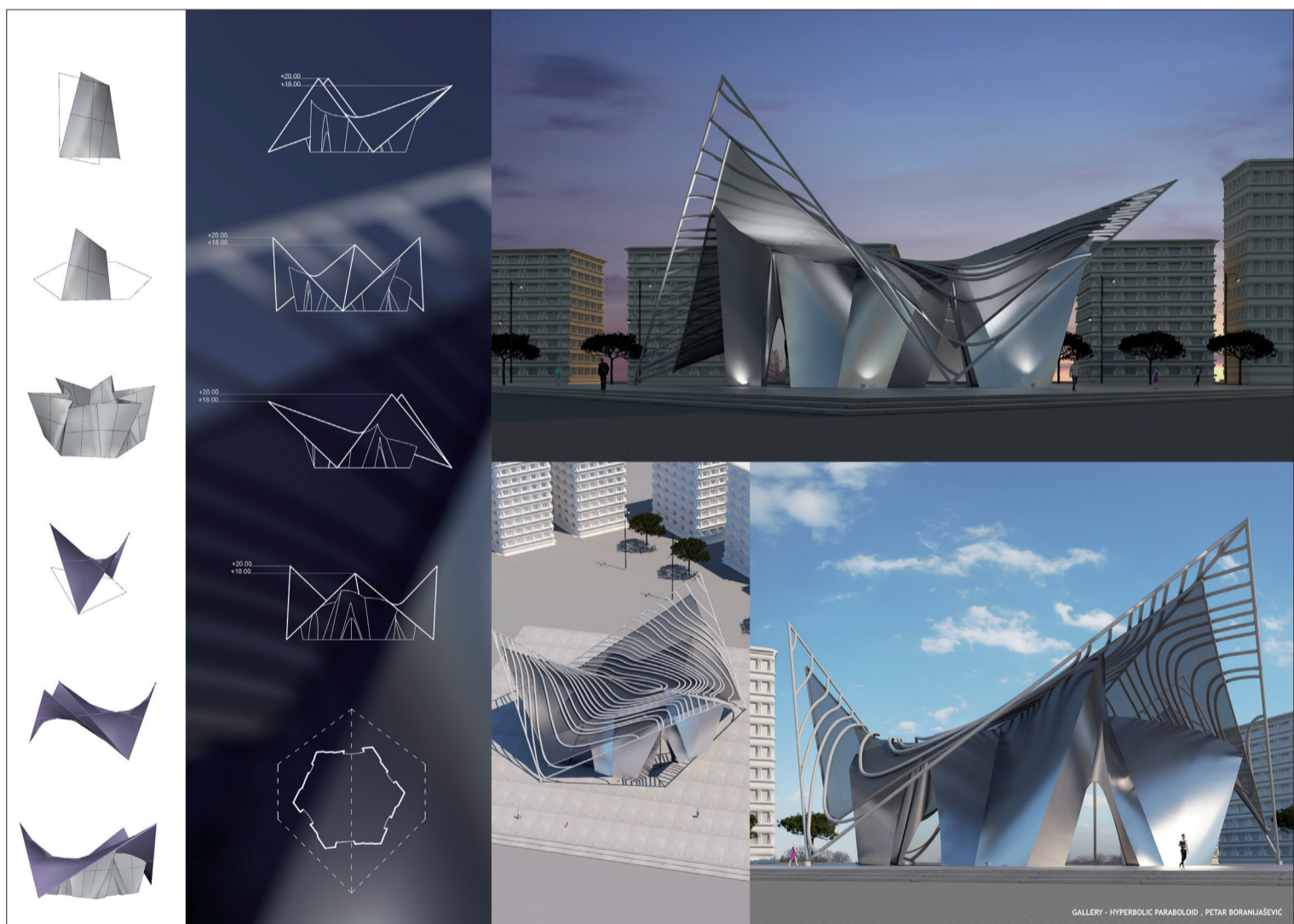
radmila-d@hotmail.co.uk
markojovanovic@uns.ac.rs

Galery – Hyperbolic Paraboloid

The building form is derived from six rotated, symmetrically placed walls which have shape of hyperbolic-paraboloid. Doors and windows of the object are obtained from cone subtractions out of the walls. Roof is derived from two hyperbolic paraboloids mirrored by one of the longer sides. Roofing is achieved by glass coating supported by distinctive, wave-form metal structure that gives the building an even more dynamic look. Dominant material that is used is metal structure that reflects the building surroundings by day, and by night it uses carefully placed light reflectors to emphasize the curves of the building. The main purpose of the building is exhibition gallery.

AUTHOR

Petar Boranijašević



ABOUT THE AUTHOR

Petar Boranijašević is a student of Architecture at the Faculty of civil Engineering and Atchitecture, University of Niš, Serbia.



petarboranijasevic@gmail.com

Ruled Surface Fence

The project was part of a semestral assignment within the Urban Design 2 course at the Interior and furniture design department of the Faculty of Applied arts. Participatory design project was done in cooperation with the elementary school Mihajlo Petrović Alas in Belgrade, aiming at improving the school yard space. Faculty students collaborated with primary school pupils, teachers and parents in search for the optimal solutions and designs of the specific zones of the school yard. The new fence was designed using the geometric principle of generating ruled surfaces by non-parallel lines, as a “twist” and a dynamic upgrade of an ordinary vertical lines fence. It was also a way to make a fence higher and the yard safer, as requested by the school staff.

AUTHORS

Isidora Ristovski, Biljana Branković



ABOUT THE AUTHORS

Isidora Ristovski, author of the concept design is a bachelor of interior and furniture design at the University of Arts Belgrade, Faculty of Applied Arts.

Biljana Branković, mentor and author of the detailed design is an assistant professor of Interior and furniture design at the University of Arts Belgrade, Faculty of Applied Arts.



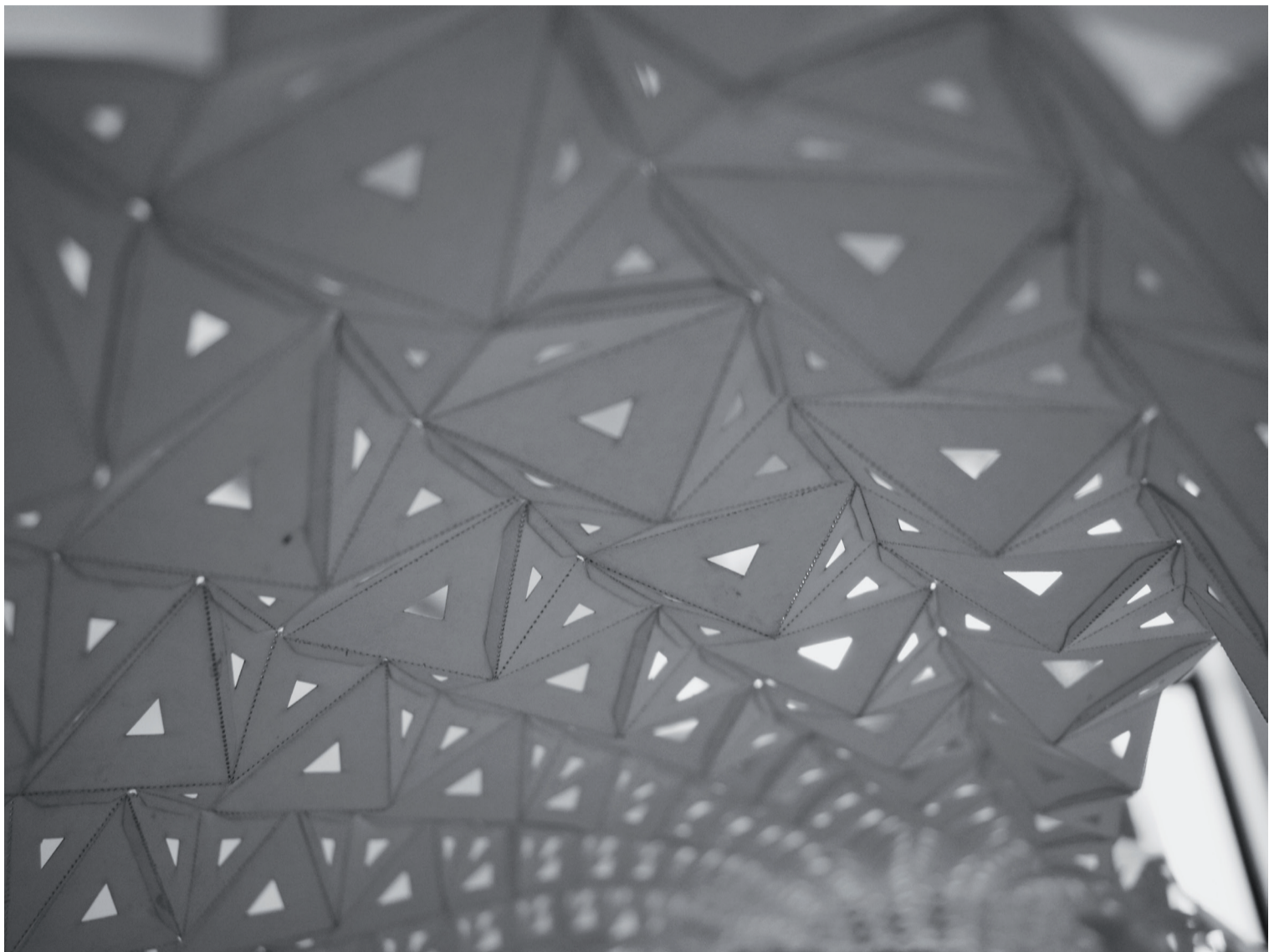
ristovskisidora@gmail.com
biljana.brankovic@fpu.bg.ac.rs

Waterbomb pavilion

The aim of this project is to design a structure which uses origami design in reference to both radiation protection and daylight utilizations. The location of the pavilion is the public place Trg Republike in Novi Sad. The pavilion shape was designed in a way which does not damage the appearance and atmosphere of the square. Accordingly, analyzing the sun movement at the location and incorporating it with the waterbomb pattern, curvature of the pavilion was set. Additionally openings are distributed in such way to gradually provide penetration of sun rays. The base scale model is made out of cardboard sheet. All elements are cut and incised with CNC milling machine.

AUTHORS

David Danji, Emeše B. Varga



ABOUT THE AUTHORS

David Danji and Emeše Varga are students of Architecture at the Faculty of Technical Sciences, Novi Sad, Serbia.



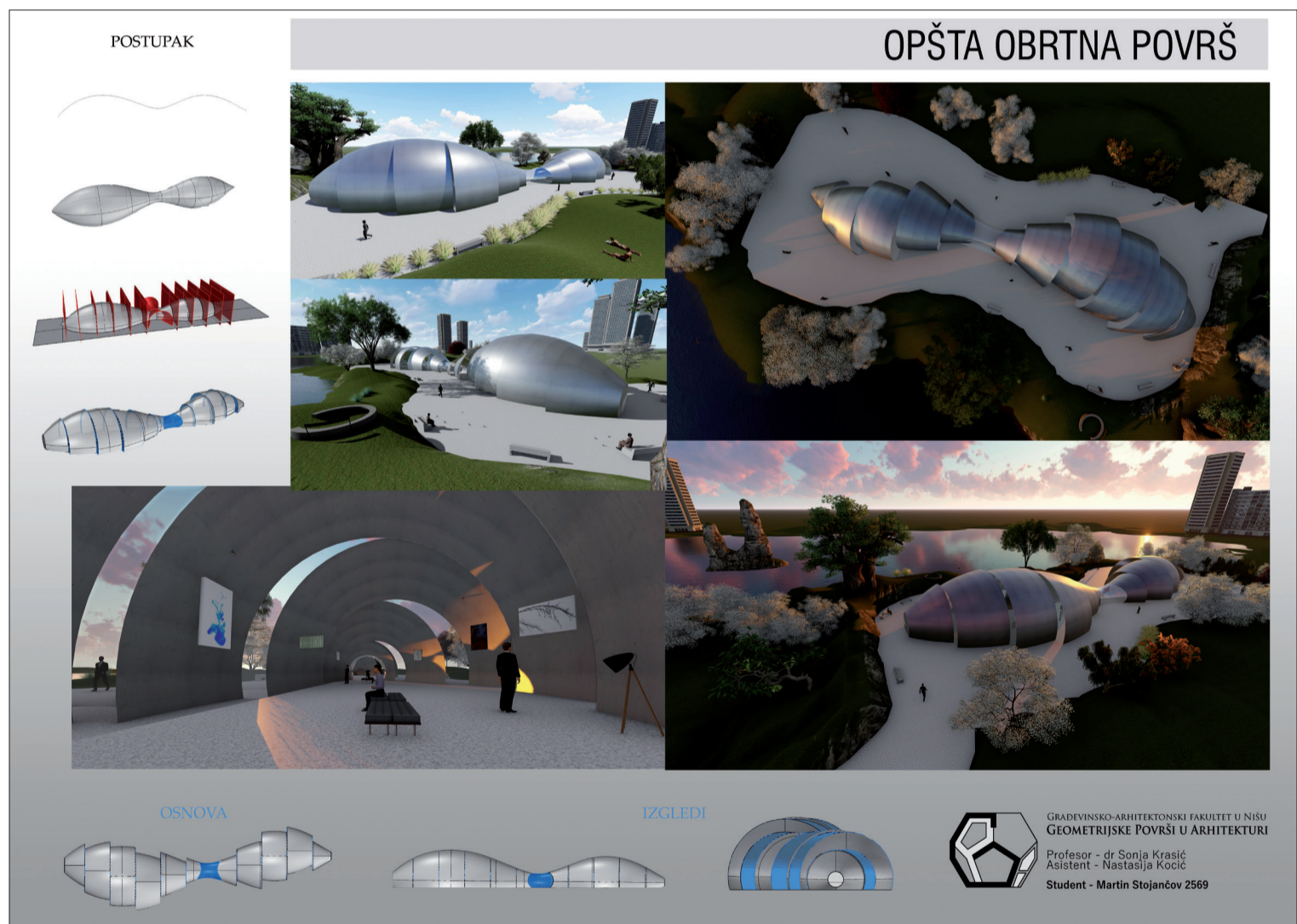
daviddanji95@gmail.com
emesebvarga96@gmail.com

Exhibition Space

Conceptual design of the free-form Exhibition Space created by rotating a curved line 360 degrees around its axis.


Idea for this project originates from the University course "Geometrical Surfaces in Architecture", where we have been given geometric surface or form (like sphere, hyperbolic paraboloid, cone, etc..) and our job was to give that surface an architectural use (creating a building out of it). A surface that was given to me was general revolving surface where I needed to create a form by drawing a curved line and rotate it 360 degrees around its axis. My idea was to cut obtained form in the middle horizontally and then cut couple of sections to move them and to create openings that will illuminate the space and give an interesting look to the building. At the middle section of the form, which is the lowest part, is the entrance to the building which is made out of cast glass and represents a visual bridge that connects two parts of the building. The whole building is covered by metal finish to give it a visual twist.

AUTHOR
Martin Stojančov



ABOUT THE AUTHOR

Martin Stojančov is a student of the Faculty of Civil Engineering and Architecture, University of Niš, Serbia.

 mstojancov@gmail.com

Module and space

Student project "Module and Space" was a part of a semester assignment within the Basics of Spatial Design - a first year course at the Interior and furniture design department of the Faculty of Applied arts. The aim was to create an abstract spatial composition using a geometrical module created out of a plane square paper.

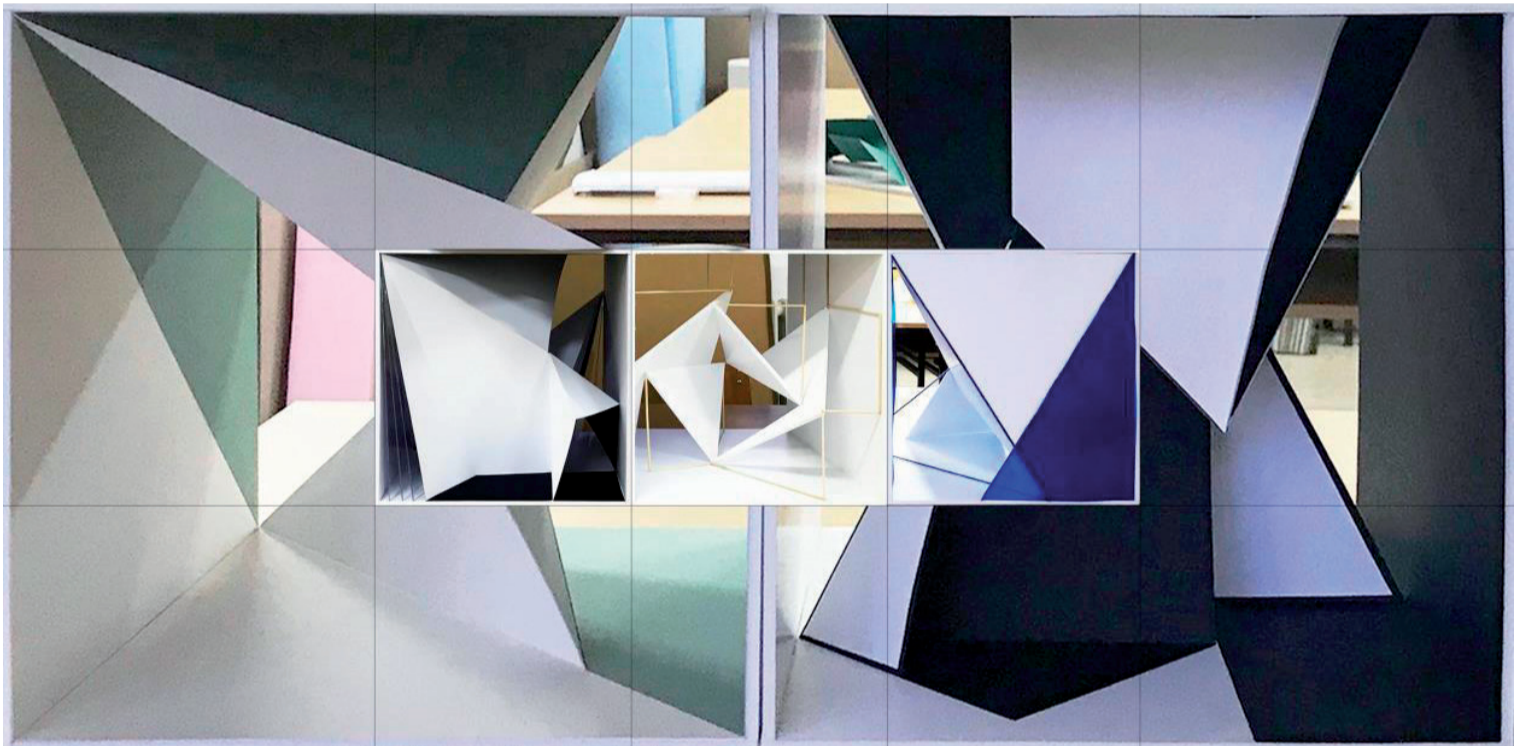
AUTHORS

Students, authors of presented projects:

Sofija Plavšić, Tijana Bilanović, Simona Vlček, Anja Rakonjac, Milica Stojković

MENTOR on the project:

Mirjana Milakić



ABOUT THE AUTHORS

The students are attendants of the Faculty of Applied arts, University of Arts, Belgrade.

The mentor, Mirjana Milakić is a teaching assistant at the Department for Interior and Furniture Design at the Faculty of Applied arts, University of Arts, Belgrade.



mirjanamilakic@gmail.com

Shape Design

Presented works were created on the Shape design course at the Faculty of Applied Arts in Belgrade, which students attend during the first year of the undergraduate studies. Aim of the course is application of geometry, theories of proportion, form and colour in visual arts. In the course students apply different geometric themes and methods to create original solutions or visual effects in the field of photography, graphic design, print making, illustration, animation and conservation and restoration. Students acquire theoretical knowledge through practical work dealing with the chosen topic and technique within a particular discipline. In this course interdisciplinary approach to the task contributes to artistic research with an artistic work as a final result.

Students' work presented in this exhibition is divided into two parts. The first part covers various topics that are subjects in the course Shape design, such as regular polygons, conic, spirals, polyhedrons, proportions, perspective and optical illusions. The second part consists of the workshop work created on the theme "Ornament, Tessellation, Fractals". When addressing this theme, motifs and techniques were defined according to the modules to which students belong.

AUTHOR

Marijana Paunović



ABOUT THE AUTHOR

Marijana Paunović, PhD. is an assistant professor at the Faculty of Applied arts, University of Arts, Belgrade.



marijana.paunovic@fpu.bg.ac.rs

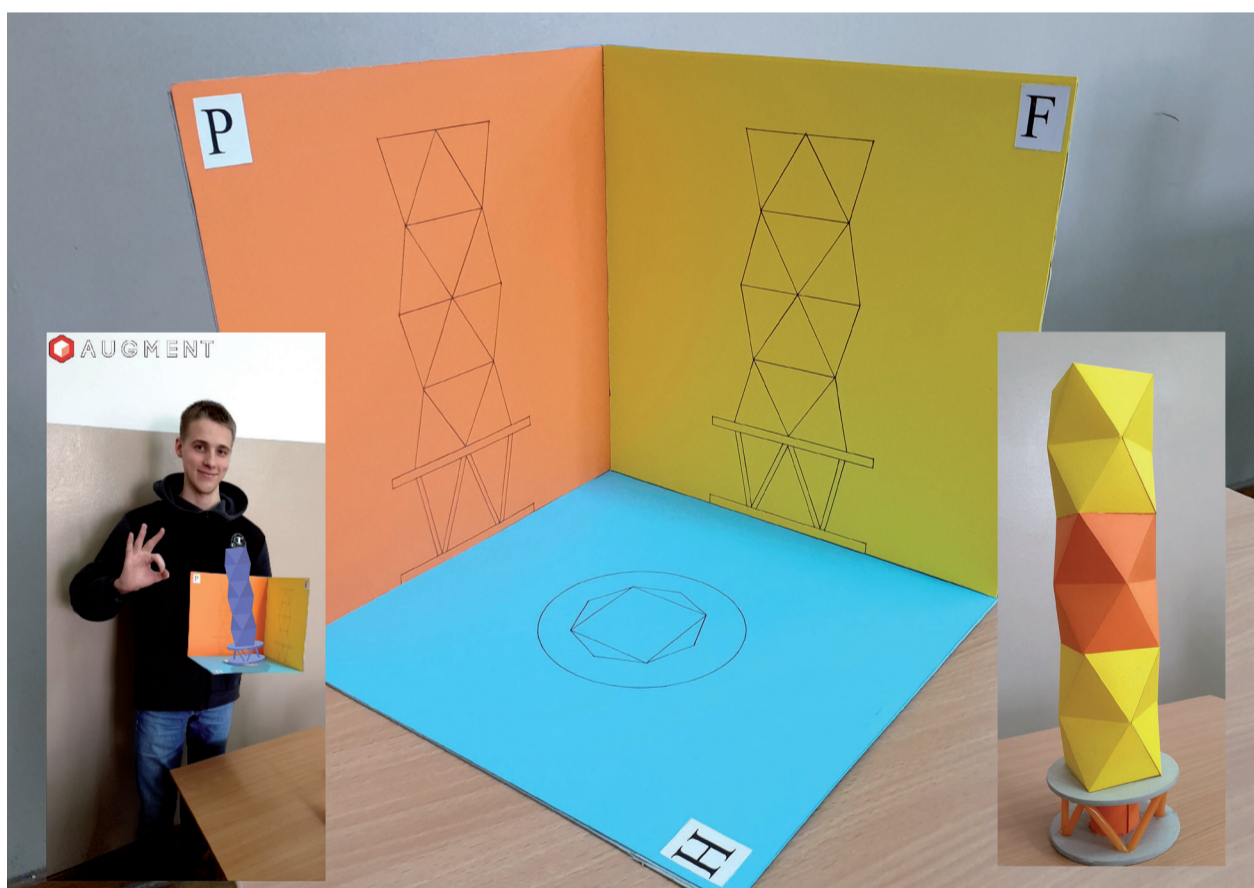
An Additional Students' Task at Descriptive Geometry

At the Faculty of Civil Engineering, University of Belgrade, beside the obligatory forms of lectures and exercises, freshmen students have the opportunity to widen their practical experience in application of geometric knowledge, gained at Descriptive Geometry course, through non obligatory workshop. It was organized at the Faculty classrooms during two days, such that a group of students (three students) works on a creative geometry task, within given conditions. Starting from free choice of an existing or imagery type of architectural structure (a whole building or its roofing structure) students should provide its geometric interpretation of orthogonal projections on a 3D physical model of coordinate system -1; 3D model in Auto-CAD software (the alternative is cardboard model) - 2; presentation of a structure in 3D augmented reality application "Augment" – 3; visual appearance of a structure in architecture/design (a photo image) -4; poster summary of the sub-tasks – 5. The satisfactory completion of a task would enable a student to get higher grade in the final exam at Descriptive geometry course.

Based on the results of additional questionnaire administered to the participants at the end of the workshop, besides good achievement, creativity, self-confidence and high-quality teamwork significantly contribute to overall satisfaction of students.

AUTHORS

Magdalena Dragović, Aleksandar Čučaković, Svetlana Čičević, Aleksandar Trifunović, Tamara Matijević, Veljko Matić



ABOUT THE AUTHORS

Dr Magdalena Dragović is an assistant professor and Dr Aleksandar Čučaković is an associate professor at the Faculty of Civil Engineering University of Belgrade, Belgrade, Serbia.

Dr Svetlana Čičević and Aleksandar Trifunović, PhD are affiliated to the Faculty of Traffic and Transportation, University of Belgrade, Serbia.

Tamara Matijević and Veljko Matić are students of the Faculty of Civil Engineering, University of Belgrade, Serbia.



dim@grf.bg.ac.rs
cucak@grf.bg.ac.rs

Hexagonal pavement with attractor based scaling and gradient

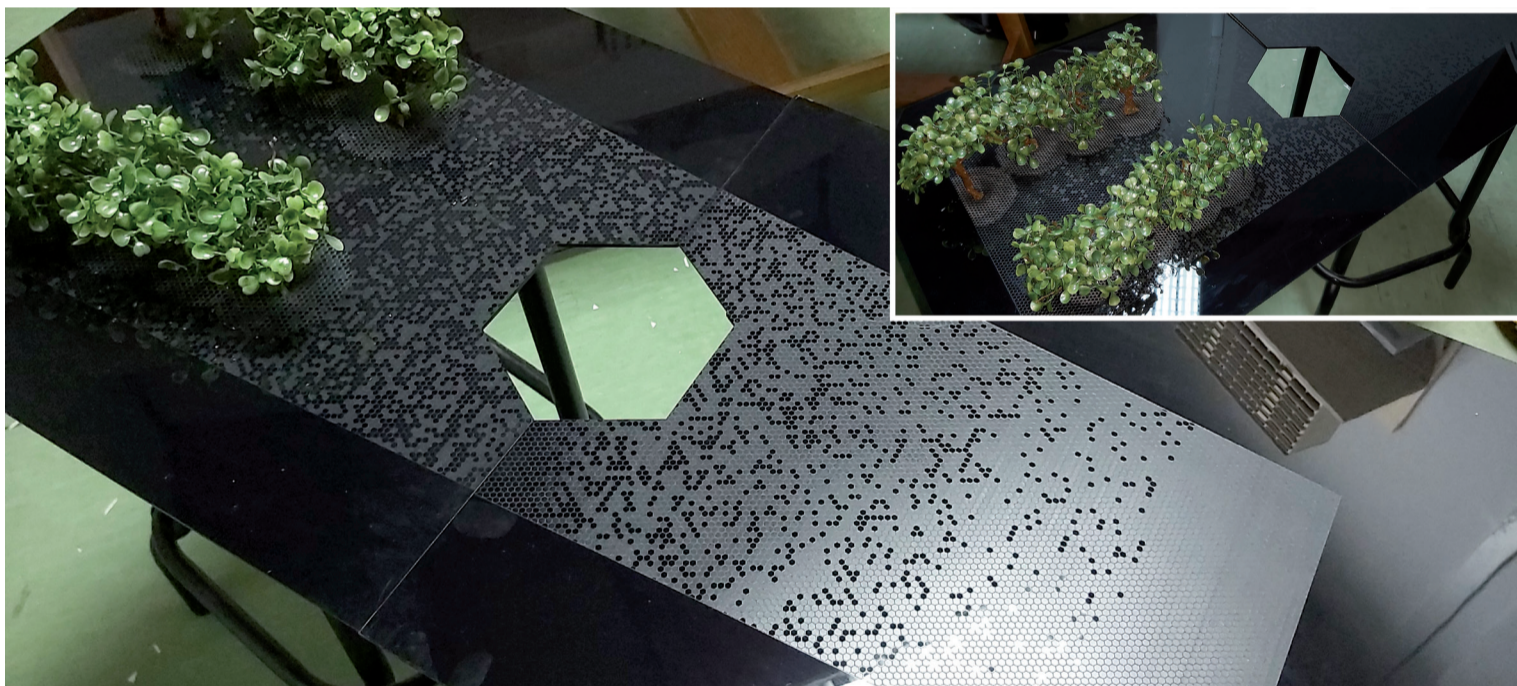
The main idea was to dedicate the square to one of the Serbia's most renowned astronomers, Milutin Milanković. Therefore the design was based on futuristic geometry design with point attractors.

The point attractors serve as a metaphor of the sun and its surrounding planets and stars, but not only that, the trees on this planet are the center of life, and so they are the ones serving as the point attractors. For the pavement design, it was decided that the hexagonal shape with attractor based scaling and gradient would fit the most, considering the futuristic design of the space.

As for self-sustainability the whole square would be powered with an already proven concept of "Pave-Gen", the pavement design that provides power using piezo-electric materials that generate electricity using force (in this case stepping on the pavement). Not only does this provide power to the square but it also enables its users, though specific cellphone identification, to interact with the space (ie. to see how much power their walking generated, earning discounts in the nearby restaurants, etc.). A special hexagonal shaped area in the middle of the square should serve as the main feature and attraction. Around every point of the area there would be trigger plate that when a user steps on it, it would light up a certain zodiac constellation covering the whole hexagon area.

AUTHOR

Aleksandar Lesmajster



ABOUT THE AUTHOR

Aleksandar Lesmajster is a Bachelor of Landscape Architecture / Master's Degree Student of Architectural Visualization, Faculty of Tehnical Sciences, University of Novi Sad.

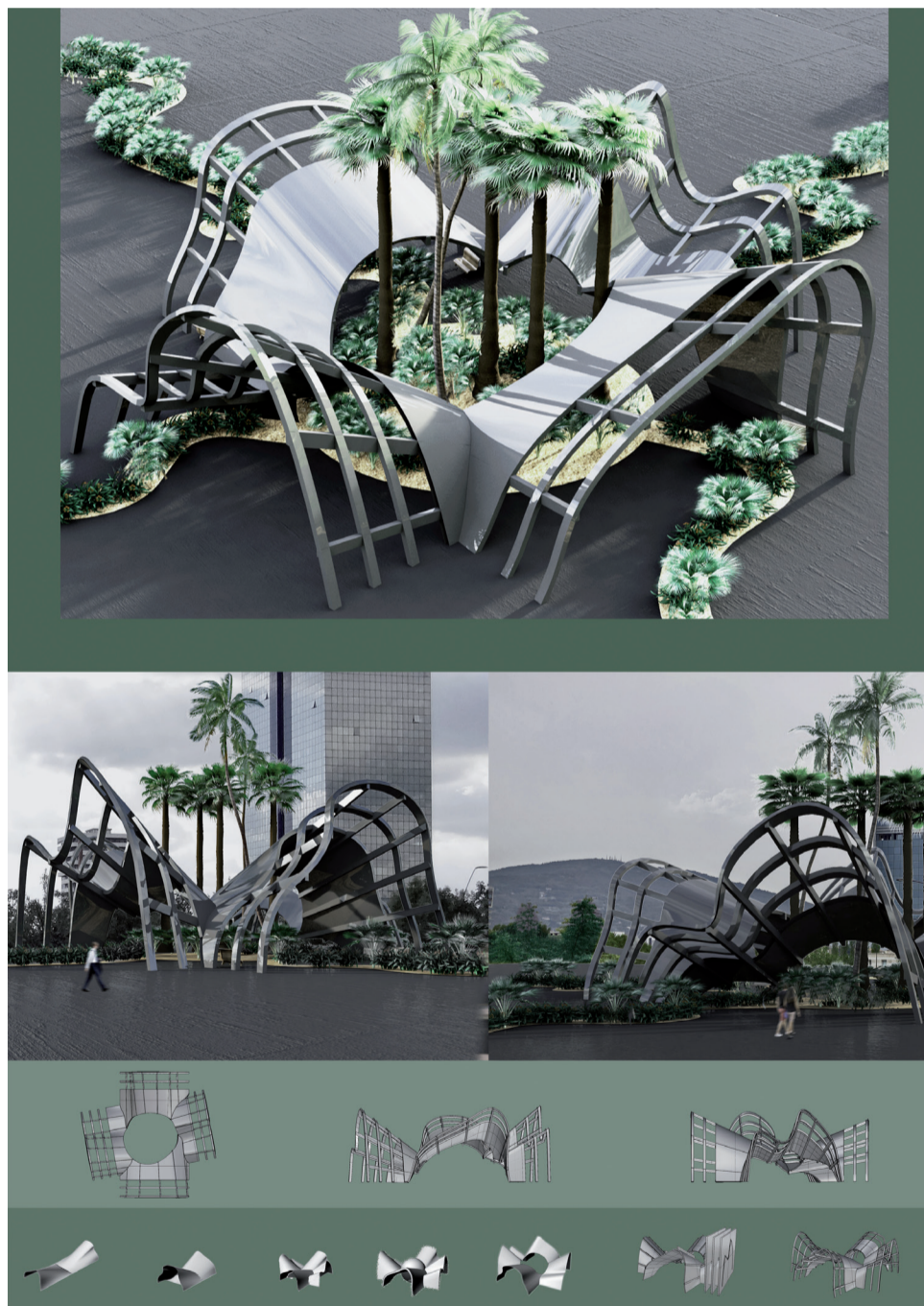


aleksandar.lesmajster@gmail.com

FE Pavilion

The main virtue of conoid surfaces is how easy it is to combine them into something visually and functionally stunning. The 'FE-PAVILION' is entirely made of metal materials and interacts with the mainly concrete surrounding. The idea was to make a walk-through open space which will integrate with landscape design, architecture and visual arts so it can connect the people who consume it. As most conoid shells have usual curves like circles and ellipses, my goal was to make a totally broken curve which gives the pavilion a more dynamic look and can reflect the metal materialization in a better way. Temporary architecture can make a huge difference in viewing and feeling the urban space around us and I personally think that my project contributes to that.

AUTHOR
Uroš Antić



ABOUT THE AUTHOR

Uroš Antić is a student of Faculty of Civil Engineering and Architecture, University of Niš, Serbia.



anticuros6@gmail.com

About The Selection Committee

Ioanna Symeonidou, PhD, Assistant Professor, Department of Architecture, University of Thessaly, **(Greece)** is an architect engineer specializing in digital media for design and manufacturing. She has graduated from the Architecture Department of the Aristotle University of Thessaloniki with Honors, and she has completed her postgraduate studies at the Architectural Association in London in the thematic area of Emergent Technologies and Design. Her doctoral dissertation at the Aristotle University of Thessaloniki focuses on digital design and construction methods. She has taught at the University of Thessaly, the Aristotle University of Thessaloniki, and Graz University of Technology in Austria. She is the author of more than 40 papers, published in scientific journals, books and conference proceedings, and has participated in research projects in Greece and abroad.

Vesna Stojaković, PhD, Associate Professor, Faculty of Technical Sciences (FTN), Novi Sad, **(Serbia)** has a MSc degree (2004) in the field of architecture and PhD in the field of digital technologies applied to architecture (2011). She is employed at Faculty of Technical Sciences, University of Novi Sad as assistant professor at Department of Architecture. She teaches geometry and digital technologies applied to architecture and design. She is the Head of Digital Design Center and the Head of the Department of Theories and Interpretations of Architectural Space. She published many papers in journals and conferences and participated in scientific, design and art projects and exhibitions. From 2016 to 2018 she was President of SUGIG (Serbian Society for Geometry and Graphics). She is a member of the Editorial Board of the Nexus Network Journal.

Giampiero Mele, PhD, Full Professor, University e-Campus, **(Italy)** received his PhD in "Survey and Representation of architecture and the environment" at the University of Florence in 2000, and a PhD in "Architectural and Urban Design" from the Université di Paris 8 in 2004. Since 2014, he has been a Full Professor at the Università degli studi e-Campus, and professor of descriptive geometry at the University of Florence, at the Politecnico di Milano and University of Ferrara. His fields of research are the relationships between geometry and arithmetic in historic architecture, and drawing in architecture and design. He has given talks at various conferences in these fields, and is the author of numerous scientific papers.

Dr Naomi Ando, architect, Hosei University, Tokyo **(Japan)** is a professor of architecture at Hosei University, Tokyo Japan. He received his Doctor of Engineering degree from Tokyo Institute of Technology (1997). His research interests are the analysis of forms and spatial images of architecture, application of computer graphics to architectural and urban planning. His research papers in English have appeared in Journal for Geometry and Graphics (International Society for Geometry and Graphics), FME Transactions (University of Belgrade, Serbia), Journal of Industrial Design and Engineering Graphics (Sorging, Romania), etc. In 2019, his 3D model work "Automatic Generation of a Cityscape: Shibuya, Tokyo" won the Excellence Award in the 11th Digital Modeling Contest, which is held by Japan Society for Graphic Science.

Jelena Milošević, PhD, Assistant Professor, Faculty of Architecture, University of Belgrade, **(Serbia)**, graduated (2006) and received her PhD (2016) at University of Belgrade – Faculty of Architecture where she has been employed since 2011. She is currently Assistant Professor at the Department of Architectural Technology. The focus of her scientific research is the areas of structural systems and spatial structures, morphology, generation and optimization of structures. She is a participant of national and international scientific projects, with numerous papers published in journals, proceedings and monographs. Her professional involvement is focused on architectural and urban planning designing. She has exhibited her works in several exhibitions and participated in the organization of exhibitions. She is the author of award-winning projects and mentor of award-winning student papers. She is also a member of the International Association for Shell and Spatial Structures (IASS).

About The Selection Committee

Mateja Budin, mathematician, Head of Mathema, the Institute for Popularization of Mathematics in Ljubljana (**Slovenia**) studied applied mathematics at the Faculty of Mathematics and Physics, University of Ljubljana. In 2003 she established Mathema, Institute for popularization of mathematics. She is co-founder of the Foundation Mathema Art; she runs the House of Polyhedra and organizes national competitions in Slovenia. Her main interests are in the field of polyhedra, spatial visualization, logic and math-art.

Ratko Obradović, PhD, Full Professor, Faculty of Technical Sciences (FTN), Novi Sad, (**Serbia**) is head of the Chair for Computer Graphics and also the founder and head of Computer Graphics – Engineering Animation Studies (at the Undergraduate, Master and Doctoral level of Academic Studies) since their establishment at the Faculty of Technical Sciences in 2011. His research interests include: Computer Graphics, Computer Geometry, Computer Animation, CAD, Scientific Visualization, Virtual and Augmented Reality, Higher Education. He is the author or coauthor of four books and has published 35 journal papers and more than 40 articles in Conference proceedings. He is also a coauthor of a CG animated film Alea lacta Est presented at the Belgrade Documentary and Short Film Festival in 2012. From 2010 to 2012 he was President of SUGIG (Serbian Society for Geometry and Graphics).

GianLuca Stasi, PhD, Ctrl+Z Studio Founder, Univesidad de Sevilla, (**Spain**). Architect by training (Rome, 2015) he has explored the fields of mathematics and geometry driven by personal fascination. Today these subjects are a cornerstone of his practice and were one of the main topics of his doctoral thesis (Seville, 2018). At the same time, he also developed an artistic research and production that feeds form and to the main professional activity. This has led him to participate in congresses, events and exhibitions on these topics such as Geometrias'19 (Portugal), the Bridge Congress 2018 (Sweden) or the Joint Mathematical Meetings 2018 (USA), etc. His productions can be found at: <http://www.ctrlz.net>

Tanja Manojlović, Full Professor at the Faculty of Applied Arts, the Department of Interior and Furniture Design, University of Arts in Belgrade (**Serbia**) teaches subjects related to spatial design at all education levels. She has realized dozens of constructions for different purposes in Serbia and Russia. Field of work: interior design, inclusive design, architecture and urban design. Author or co-author of over 50 projects (student workshops with exhibitions and presentations of projects created under her mentorship or with her commentary) at over 50 exhibitions and events in Serbia and abroad, many by invitation: Salon of Architecture, Belgrade Furniture Fair, Belgrade Building Expo, International Landscape Architecture Exhibition, Mikser Festival, Belgrade Design Week, DESIGNBOOM MART – Stockholm Furniture Fair, Mantova Creativa, Promenade Verona. Mentor of many award-winning student projects. Member of the jury of the Salon of Architecture 2014, as well as many student competitions. Founder of PreSalona, a traditional student event within the Salon of Architecture.

CIP - Каталогизација у публикацији - Народна библиотека Србије, Београд

514(083.824)
004.92(083.824)

DIMENSIONS reflected : catalog : exhibition of ideas, designs and models, September 19-21. 2020. Belgrade Serbia = izložba ideja projekata i modela / [editor in chief = glavni urednik] curator/kustos Marija Obradović. - Belgrade : Faculty of Mechanical Engineering, University, 2020 (Belgrade : Planeta print). - 39 str. : ilustr. ; 35 cm

Na vrhu nasl. str.: Accompanying program of the 7th International scientific conference 'moNGeometrija 2020'. - Tiraž 60. - Curator's Foreword = Predgovor Kustosa: str. 8.

ISBN 978-86-6060-049-5

1. International Scientific Conference on Geometry and Graphics (7 ; 2020 ; Beograd)

a) Геометрија - Изложбени каталози
b) Рачунарска графика - Изложбени каталози

COBISS.SR-ID 19975945
