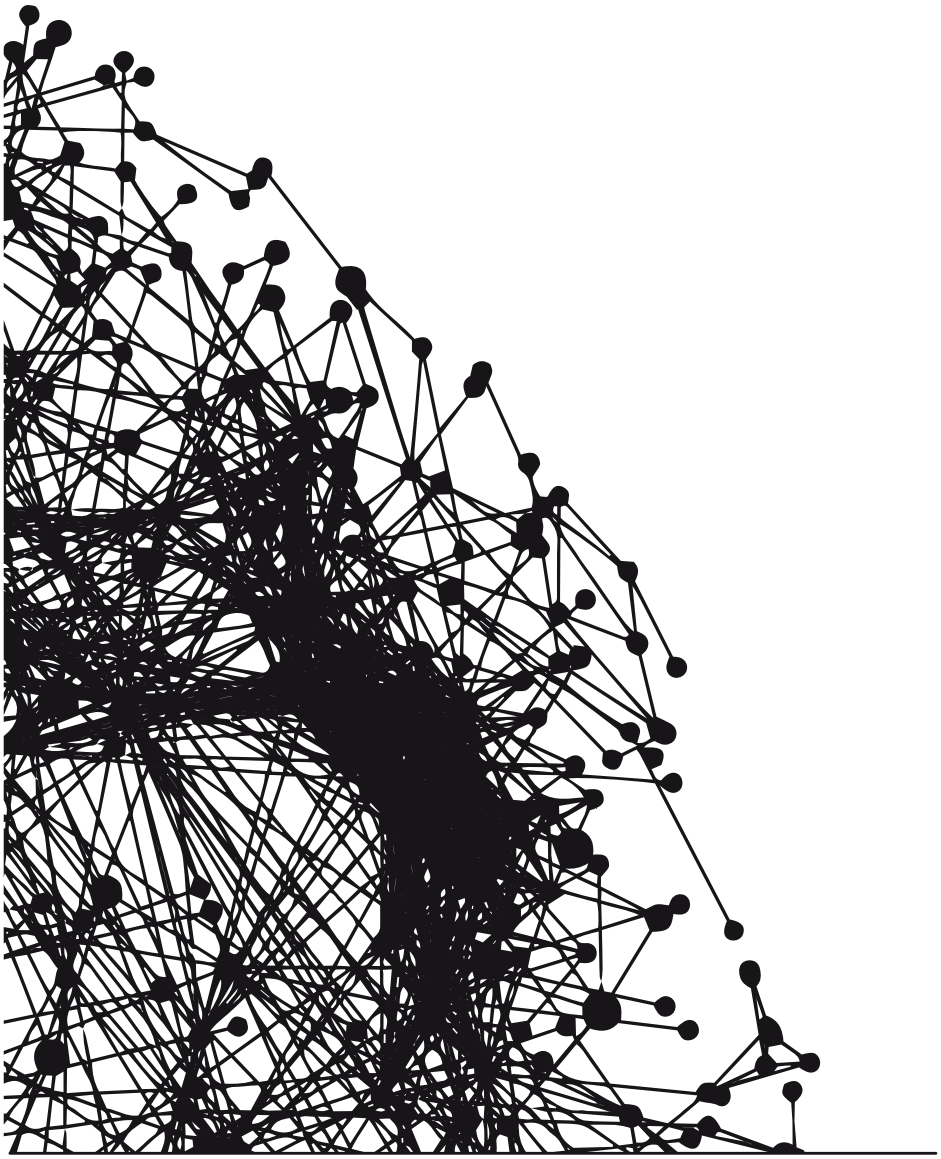
1ST INTERNATIONAL ACADEMIC CONFERENCE

PLACES AND TECHNOLOGIES 2014

BELGRADE, 3-4. APRIL 2014 | KEEPING UP WITH TECHNOLOGIES TO IMPROVE PLACES

EDITORS:
Eva Vaništa Lazarević, Aleksandra Đukić,
Aleksandra Krstić - Furundžić, Milena Vukmirović

conference proceedings



ISBN 978-86-7924-114-6

www.placesandtechnologies.eu

Proceedings of INTERNATIONAL ACADEMIC CONFERENCE ON PLACES AND TECHNOLOGIES

April 3-4, 2014, Belgrade, Serbia

PLACES AND TECHNOLOGIES 2014

Proceedings of First International Academic Conference on Places and Technologies

International Academic Conference on Places and Technologies, Places and Technologies 2014, will be the first conference organized by Univerisity of Belgrade – Faculty of Architecture, Professional association Urban Laboratory and University of Belgrade – Faculty of Philosophy.

Editors: Dr Eva Vaništa Lazarević, Dr Aleksandra Krstić-Furundžić, Dr Aleksandra Đukić and Dr Milena Vukmirović

For publisher: Dr Vladan Đokić

Publisher: University of Belgrade – Faculty of Architecture

Design: Stanislav Mirković

Place and year: Belgrade 2014

ISBN 978-86-7924-114-6

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

711.4.01(082)(0.034.2)
711.4:005.591.6(082)(0.034.2)

INTERNATIONAL Academic Conference on Places and Technologies (1st ; 2014 ; Belgrade)
Places and Technologies 2014 [Elektronski izvori] : keeping up with technologies to improve places : conference proceedings : 1st international academic conference, Belgrade, 3-4. April 2014 / [organized by Univerisity of Belgrade - Faculty of Architecture, Professional Association Urban Laboratory and University of Belgrade - Faculty of Philosophy] ; editors Eva Vaništa Lazarević ... [et al.]. - Belgrade : Faculty of Architecture, 2014 (Belgrade : Faculty of Architecture). - 1 USB fleš memorija ; 1 x 2 x 14 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovnog ekrana. - Tiraž 150. -
Bibliografija uz svaki rad.

ISBN 978-86-7924-114-6

1. Vaništa Lazarević, Eva, 1961- [уредник]
2. Faculty of Architecture (Belgrade)
a) Градови - Мултидисциплинарни приступ - Зборници b) Урбанистичко планирање - Технолошки развој - Зборници

COBISS.SR-ID 206380812

Organizers

University of Belgrade | Faculty of Architecture

URBANLAB
PROFESSIONAL ASSOCIATION URBAN LABORATORY

ФИЛОЗОФСКИ ФАКУЛТЕТ
1838

General sponsor

Telekom Srbija

Sponsors

Inženjerska komora Srbije

INSTITUT FRANÇAIS
SERBIE

Gradska opština Savski Venac

Arhi.pro

PHILIPS

Foundation Dokukino

Donators

Република Србија
МИНИСТАРСТВО ПРОСВЕТЕ,
НАУКЕ И ТЕХНОЛОШКОГ РАЗВОЈА

TONDACH
Krov za sva vremena!

LAFARGE

Supporters

ISOCARP
Knowledge for better Cities

CENTAR ZA ARHITEKTURU BEOGRAD

Stalna konferencija gradova i opština

SUPER PROSTOR
Portal za arhitekturu i kulturu prostora

CONTENTS

PART I: URBANISM

Urban planning and technologies

OVERCOMING BARRIERS TO GROWTH
Stephen Platt 16

URBAN CHALLENGES OF ENERGY EFFICIENCY AND CONTEXT-SENSITIVE PLANNING APPROACHES IN BULGARIA
Elena Dimitrova 25

NEW URBAN PROTOCOLS FOR FRAGMENTED TERRITORIES _ THE EXAMPLE OF WESTERN THESSALONIKI
Styliani Rossikopoulou-Pappa, Valia Fragkia 33

A FEASIBILITY STUDY FOR A TECHNOLOGICAL PARK IN FALCONARA MARITTIMA AN, ITALY
Giovanni Sergi 41

SAVING URBAN PLANNING FROM ANOTHER UTOPIAN MODEL
Danijela Milojkić, Marija Maruna 48

THE IMPLICATIONS OF DIGITAL TECHNOLOGY ON THE PERCEPTION OF CENTRALITY
Mihai Alexandru, Cătălina Ioniță 56

TECHNOLOGY AND LANDSCAPE: REDUCE, REUSE AND RECYCLE THE MINING DROSSCAPES
Nicola Martinelli, Francesco Marocco, Alessandro Reina, Maristella Loi, Federica Greco 63

THE ILLEGAL SETTLEMENTS IN BELGRADE VS. TAMING CITY GROWTH: CASE STUDY OF BELGRADE
Biserka Mitrović, Miodrag Ralević, Branislav Antonić 71

IMPACT OF CLIMATE CHANGE IN URBAN PLANNING
Tamara Tošić 78

CONCEPT OF URBAN VILLAGE: THE APPLICATION OF THE CONCEPT AS A FOUNDATION FOR NEW TYPOLOGY OF URBAN VILLAGES
Branislav Antonić 85

RESILIENCE AND VULNERABILITY OF URBAN SYSTEMS. A METHODOLOGICAL PROPOSAL FOR SEISMIC RISK MITIGATION
Rigels Pirgu 94

Urban design and technologies

PUBLIC PLACES AND SPLIT DEVELOPMENT MODEL
Višnja Kukoč 103

AGILE LANDSCAPES: REDESIGNING URBAN SPACE
Anastasios Tellios, Despoina Zavraka 110

PLANNING AND DESIGNING SAFE AND SECURE OPEN PUBLIC SPACES IN SERBIA
Svetlana Stanarević, Aleksandra Djukic 118

SPATIAL AND FUNCTIONAL TRANSFORMATION OF BUSINESS AREAS UNDER THE IMPACT OF INFORMATION TECHNOLOGIES – CASE STUDY OF NIŠ ADMINISTRATIVE DISTRICT
Aleksandar Ristić, Petar Mitković 130

THE IMPACT OF NEW TECHNOLOGIES ON CITY ACUPUNCTURE METHODOLOGY AND INTERVENTIONS
Kristina Careva, Rene Lisac 138

COMFORT OF OPEN PUBLIC SPACES: CASE STUDY NEW BELGRADE
Aleksandra Djukic, Nevena Novakovic 145

005 PUBLIC ART IN BERLIN
Biljana Arandjelovic 151

PROTECTION OF PERSON WHIT DISABILITIES: IMPLEMENTATION OF ACCESSIBILITY STANDARDS
Dragana Vasiljevic Tomic, Radojko Obradović 160

VERTICAL PUBLIC SPACE
Sorana Cornelia Radulescu, Roger Riewe 167

READY-AVAILABLE HYBRID METHODOLOGIES FOR CONTEMPORARY PUBLIC SPACE RESEARCH
Milena Ivkovic, Berit Piepgras, Robin van Emden 175

RETAIL – NEW TECHNOLOGIES AND URBAN CENTRALITY
Martin Brabant 181

TECHNOLOGY AND NEOLIBERAL URBAN PLACES
Marija Cvjetković 191

NEURAL CITIES OR HOW CITIES TEACH US TO DESIGN THEM BETTER
Angelica Stan 198

MORPHOLOGICAL AND TYPOLOGICAL CLASSIFICATION OF GREEN STREET FORMS: MLADEN STOJANOVIC STREET IN BANJA LUKA
Tanja Trkulja 206

Urban regeneration and tehcnology

PROPERTY ISSUES IN THE TURKISH URBAN REGENERATION PROJECTS
Mehmet Çete, Yunus Konbul 215

URBAN ENERGY AND URBAN REGENERATION STRATEGIES: EVALUATION OF IZMIR-UZUNDERE URBAN REGENERATION PROJECT
Yakup Egercioğlu, Çilem Türkmen 222

THE EMPTY URBAN SPACES AS AN OPPORTUNITY FOR THE CITY TO REINVENT ITSELF: THE CASE OF THE INDUSTRIAL TECHNOLOGICAL OBSOLETENESS
Cătălina Ioniță, Mihai Alexandru 230

ENHANCEMENT OF URBAN LIFE QUALITY IN URBAN REGENERATION PROJECTS: IZMIR-BAYRAKLI URBAN REGENERATION PROJECT
Yakup Egercioğlu, Tuğçe Ertan 238

THE INDUSTRIAL BUILDINGS WHICH USED IN SAUDI ARABIA AND SUSTAINABILITY
Wael Al-Buzz 246

AN OVERVIEW OF URBAN REGENERATION PROJECTS IN TURKEY
Yunus Konbul, Mehmet Çete 257

ART AND CULTURE AS INITIATORS OF ARCHITECTURAL AND URBAN TRANSFORMATION IN SAVAMALA
Ksenija Pantović, Iva Čukić, Jasna Kavran 265

Smart cites/regions and network protocols

SMART CITY GRAZ: FROM THE VISION TO THE ACTION
Carlos Varela Martín, Ernst Rainer, Hans Schnitzer 276

RESIDENTS INTERACTION WITH HOME RESOURCES
Cerasela Dinu, Constantin-Daniel Oancea 285

RENEWABLE AND DISTRIBUTED SOURCES WITHIN SMART ENERGY REGIONS
Jovan Todorovic 293

THE SMART CITY FOR THE FUTURE. HOW A SPATIALLY ENABLED AFFECTED BY THE URBAN POPULATION?
Shahryar Habibi 300

PERFORMANCE EVALUATION OF ROUTING PROTOCOLS FOR AD-HOC NETWORKS
Ledina Karteri, Valma Prifti 306

SMART CITIES AND CHALLENGES OF SUSTAINABILITY
Rigels Pirgu 315

A FUZZY BASED CALL CONTROL SYSTEM IN MOBILE NETWORKS, CONSIDERING PRIORITY COMMUNICATIONS
Valma Prifti, Ledina Karteri 323

Historical centers, Building heritage and Technologies

ICT AND VGI TO PROMOTE MINOR HISTORIC CENTRES AND THEIR LANDSCAPE
Pierangela Loconte, Francesco Rotondo 331

THE SUSTAINABILITY AND CULTURAL HERITAGE MANAGEMENT
Christian Kersten Hofbauer, Elham Madadi Kandjani, Jean Marie Corneille Meuwissen 339

CONCEPTS OF FORMING OF URBAN SOLUTIONS IN HOUSING SETTLEMENTS IN BELGRADE BUILT IN PRECAST INDUSTRIALIZED SYSTEMS IN SECOND HALF OF XX CENTURY
Dragana Mecanov 346

NEW ARCHITECTURE IN HISTORICAL CENTRES
Alessandro Bruccoleri 355

INFORMATION AND COMMUNICATION TECHNOLOGIES TO IMPROVE THE KNOWLEDGE OF PLACES. THE ROME HISTORICAL CENTRE AS A CASE STUDY
Francesca Geremia 363

CONTEMPORARY INTERVENTIONS IN HISTORIC PLACES _ THE EXAMPLE OF THESSALONIKI METRO
Stavros Apotsos 372

Image and Identity of place

THE IMAGE OF TRIFKOVIĆ SQUARE (NOVI SAD, SERBIA) THEN AND NOW
Ivana Blagojević, Ksenija Hiel 380

IDENTITY OF NEW MEDIA SPACES
Jelena Brajković, Lidija Đokić 388

THESSALONIKI: A MULTICULTURAL ARCHITECTURAL DESTINATION
Niki Manou-Andreadis, Maria Milona 400

ELEMENTS OF IDENTITY AND UNUSED POTENTIALS OF CENTRAL ZONE IN NOVI SAD
Milena Krklješ, Dijana Apostolović, Aleksandra Milinković 408

BELGRADE SKYLINE: CONTINUITY, PARADOXES & DESIRES
Vladimir Milenković, Snežana Vesnić, Tatjana Stratimirović 416

CITY OF THE MIND - INVISIBLE IN THE MAP
Jelena Stankovic, Milenko Stankovic 424

WHAT MAKES A PLACE?
Saskia I. de Wit, Denise Piccinini 432

SUSTAINABILITY, IDENTITY AND ROLE OF TRADITIONAL MATERIALS
Olivera Ilić Martinović, Mirjana Miletić 441

IDENTITY OF URBAN SPACES; ASSESSMENT AND EVALUATION
Elham Madadi-Kandjani, Christian Kersten Hofbauer, Jean Marie Corneille Meuwissen 448

IMAGE OF SUSTAINABLE PLACES
Vladimir Parežanin, Miloš Mihajlović 456

PRESERVATION OF IDENTITY OF SPACE WITHIN RAPID ECONOMIC AND TECHNOLOGICAL DEVELOPMENT OF TOURIST DESTINATIONS IN THE EXAMPLE OD JIJOCA DE JERICOACOARA IN BRAZIL
Maja Momirov 469

PART II: ARCHITECTURE AND TECHNOLOGIES

Sustainability, Sustainable buidings and technologies

SUSTAINABLE RETROFITTING OF EXISTING AND HISTORIC BUILDINGS
Marina Traykova, Tanya Chardakova 477

OSMOTIC LANDSCAPES - RECOVERED IDENTITIES
Venetia Tsakalidou, Anastasia Papadopoulou 485

DESIGN SCENARIOS FOR AN OFFICE BUILDING – ENERGY AND ENVIRONMENTAL ASPECTS
Aleksandra Krstic-Furundzic, Tatjana Kosic 493

TECHNOLOGICAL AND ENVIRONMENTAL ASPECTS OF RAPID HOUSING CONSTRUCTION
Nikola Macut, Bojana Stanković, Nataša Ćuković-Ignjatović 507

ENERGY ANALYSIS AND REFURBISHMENT STRATEGY FOR ZAGREB UNIVERSITY BUILDINGS: FORMER FACULTY OF TECHNOLOGY IN ZAGREB BY ALFRED ALBINI
Stanka Ostojić, Zoran Veršić, Iva Muraj 515

SUSTAINABLE REUSE OF OLD STRATEGIC INFRASTRUCTURE CANAL DANUBE-TISA-DANUBE 523
Mirjana Jočić, Nataša Kuburović

PLACE ATTACHMENT AS POTENTIAL FOR SUSTAINABLE LOCAL DEVELOPMENT IN SERBIA
Anđelka Mirkov 533

LOW ENERGY BUILDINGS: CONCEPT OF ENERGY PERFORMANCE OPTIMIZATION OF SINGLE-FAMILY HOUSES
Katarina Slavković 540

TECHNOLOGY AND PRODUCTIVE PROCESS: MINING REJECTIONS FROM WASTE TO SUSTAINABLE RESOURCE
Vincenzo Paolo Bagnato, Giovanna Mangialardi, Silvana Milella, Michele Mundo 549

ADAPTATION OF AN INDUSTRIAL BUILDING INTO HIGHER EDUCATION INSTITUTION IN ACCORDANCE WITH IMPROVED ENERGY PERFORMANCE
Branko Slavković, Komnen Žižić, Danilo Dragović 557

FUNCTION OF A DESOLATE SPACE
Aleksandra Pešterac, Daniela Dimitrovska 565

ENVIRONMENT CERTIFICATION OF REHABILITATION DESIGN PROJECTS: PUT AND SHU BUILDINGS AS CASE STUDY
Florian Nepravishta, Gerta Veliu, Ramadan Alushaj 570

Green strategies and technologies

GREEN URBAN STRATEGIES IN THESSALONIKI IN THE CONTEXT OF CRISIS
Evangelia Athanassiou 580

GEOSCIENTIFIC EDUCATIVE CENTRE AS SUSTAINABLE COMMUNITIES BUILDING MODEL – POSITIVE COOPERATION EXAMPLE OF LIKA-SENJ COUNTY (CROATIA) AND UNA-SANA COUNTY (BIH)
Ivan Brlić, Anita Bušljeta-Tonković, Katarina Milković 587

THE OCCUPANTS' PERSPECTIVE AS CATALYST FOR LESS ENERGY INTENSIVE BUILDINGS
Lucia Martincigh, Marina Di Guida, Giovanni Perrucci 597

THE COLLECTIVE SELF ORGANIZED HOUSING EXPERIENCE IN ITALY
Silvia Brunoro, Giacomo Bizzarri 605

APPLICATION OF ROOF GARDENS IN THE DEFINING IMAGE OF THE CITY
Mirjana Sekulić, Bojana Stanković, Ljiljana Dosenović 613

STRATEGY FOR NATIONAL DEFINITION OF NEARLY ZERO ENERGY BUILDINGS
Milica Jovanović Popović, Bojana Stanković, Jasna Kavran 621

ENERGY OPTIMIZATION OF THE BUILDING ENVELOPE OF THE REPRESENTATIVE SAMPLE OF THE EXISTING RESIDENTIAL BUILDING IN BANJA LUKA
Darija Gajić, Aleksandra Krstić – Furundžić 629

BLUE GREEN DREAM AND DAYLIGHT
Srdjan Stankovic, Cedo Maksimovic, Milenko Stankovic 637

POSSIBILITIES FOR ENERGY REHABILITATION OF TYPICAL SINGLE FAMILY HOUSE IN BELGRADE – CASE STUDY
Bojana Stanković, Dušan Ignjatović, Nataša Ćuković-Ignjatović 646

BLUE-GREEN INTEGRATED MODELING SOLUTIONS IN URBAN PLANNING AND ARCHITECTURAL DESIGN
Miloš Mirosavić, Ivana Mirosavić, Srđan Stanković, Čedo Maksimović, Ranko Božović 654

POTENTIALS AND LIMITATIONS FOR ENERGY REFURBISHMENT OF MULTI-FAMILY RESIDENTIAL BUILDINGS BUILT IN BELGRADE BEFORE THE WORLD WAR ONE
Ljiljana Đukanović, Ana Radivojević, Aleksandar Rajčić 661

FROM BUILDING INFORMATION MODELS TO SIMPLIFIED GEOMETRIES FOR ENERGY PERFORMANCE SIMULATION
Daniel Ladenhauf, René Berndt, Eva Eggeling, Torsten Ullrich, Kurt Battisti, Markus Gratzl-Michlmair 669

ENERGY CITY GRAZ - REININGHAUS: FIRST RESULTS FROM AN ENERGY SELF-SUFFICIENT QUARTER
Heimo Staller, Ernst Rainer, Carlos Varela Martín 677

ENERGY EFFICIENCY AS ADVANCED TECHNOLOGY FOR A SOLUTION TO THE PROBLEM OF DEPOPULATION OF RURAL AREAS IN SERBIA
Jovana Stanišić 684

THE ENERGY EFFICIENT CITY
Ivan Dochev 692

Innovative materials, systems and technology

INVESTIGATION OF FLY ASH INFLUENCE ON CEMENT MORTARS PROPERTIES
Dragica Jevtić, Aleksandar Savić 701

INFLUENCE OF GLASS COMPONENT JOINTS ON THE STRUCTURAL GLASS FACADE DESIGN
Aleksandra Krstic-Furundzic, Tatjana Kosic, Jefto Terzovic 709

QUANTIFYING THE THERMAL BRIDGING EFFECT WITH REGARD TO THE FAÇADE'S CONFIGURATION
Katerina Tsikaloudaki, Theodore Theodosiou, Dimitris Aravantinos, Karolos Nicolaos Kontoleon, Dimitrios Bikas 720

THE INFLUENCE OF NEW TECHNOLOGIES ON MODERN CITY FACADES
Jasna Čikić Tovarović, Jelena Ivanović Šekularac, Nenad Šekularac 728

DYNAMIC APPEARANCE OF URBAN AND ARCHITECTURAL SURFACES
Tihana Hrastar, Tamara Marić, Bojana Bojanić 736

TOWARDS GENERATIVE CONVERGENCE IN DESIGN OF ARCHITECTURAL STRUCTURES
Jelena Milošević, Zoran Šobić, Miodrag Nestorović 744

APPLICATION OF WOOD AS AN ELEMENT OF FACADE CLADDING IN CONTEMPORARY ARCHITECTURE OF BELGRADE
Jelena Ivanović Šekularac, Jasna Čikić Tovarović, Nenad Šekularac 752

COMPARISON OF INSOLATION APPLIED ON SURFACES OF MODEL PLACED IN THE AREA OF SKOPJE
Aleksandar Petrovski, Todorka Samardzioska, Ana Trombeva Gavriloska 758

APPLICATION AND EFFECTS OF PHASE CHANGE MATERIALS IN A MODERN ARCHITECTURAL AESTHETICS
Vladana Stanković, Goran Jovanović, Mirko Stanimirović 766

INTEGRATED DESIGN OF STRUCTURAL SYSTEMS
Aleksandra Nenadović 772

NEW COMPOSITE SLAB SYSTEM – LIGHTWEIGHT CONCRETE, STEEL SHEETING AND REINFORCEMENT
Zoran Šobić, Jelena Milošević, Miodrag Nestorović 780

MODERN METHODS OF STRENGTHENING MASONRY WALLS
Nenad Šekularac, Jasna Čikić Tovarović, Jelena Ivanović Šekularac 788

NEW PERSPECTIVES FOR FERROCEMENT
Ornela Lalaj, Yavuz Yardım, Salih Yılmaz 796

Cultural patterns, Architecture and technologies

SPATIAL AND SOCIAL ASPECTS OF THE ARSENAL TRANSFORMATION, MILITARY PORT IN TIVAT INTO NAUTICAL – TOURISM SETTLEMENT AND PORT „PORTO MONTENEGRO“
Goran Radović 805

DIGITAL FABRICATION IN THE FIELD OF ARCHITECTURE
Roberto Vdović, Morana Pap 816

THE IMPACT OF SMART HOME TECHNOLOGIES ON ARCHITECTURAL DESIGN
Goran Petrović, Marko Aleksendrić 822

BETWEEN THE PLACE AND NON-PLACE: ARCHITECTURE AND TERRITORY ON THE EXAMPLE OF SKOPJE
Saša Tasić, Mitko Hadzi Pulja, Minas Bakalchev 830

INTEGRATED ARCHITECTURAL COMPLEXITY - FROM ABSTRACTION TO TECHNOLOGY AND MATERIALISATION
Rada Čahtarević, Dženana Bijedić, Amra Taso 838

EVOLUTION DIGITIZED: ARCHITECTURE OF THE SUBLIME DREAM
Mihailo Popović, Vladimir Milenković 846

MONOCHROMATIC IN THE ARCHITECTURAL COMPOSITION: WITH SPECIAL REFERENCE TO THE APPLICATION OF WHITE COLOUR
Dragana Vasiljevic Tomic, Rifat Alihodzic, Dragana Mojsilovic 853

(RE)GENERATION & REFLECTIONS OF THE SCHOOL OF ARCHITECTURE – BANJALUKA IN THE CENTURY OF KNOWLEDGE AND SKILLS
Milenko Stanković, Una Umićević 864

QUANTUM ARCHITECTURE, NON-PLACE AND ACCULTURATION
Dubravko Aleksić 873

PLACES AND PRACTICES OF CONSUMPTION IN THE POST-SOCIALIST CONTEXT
Dejana Nedučin, Dušan Ristić, Vladimir Kubet 880

INTERACTIONS BETWEEN LIGHT AND ARCHITECTURE: AN EXPERIMENT USING MODELS AND PHOTOGRAPHS
Anita Stoilkov-Koneski 888

THE INTERPLAY OF MUSIC AND ARCHITECTURE: LAYERING OF SOUND AND SPACE
Anja Kostanjšak, Morana Pap 895

CULTURAL PATTERNS AND SENSITIVITY TODAY: FROM THE PHILOSOPHY TO THE TECHNOLOGY IN ARCHITECTURAL DESIGN PROCESS

Małgorzata Kądziela, Anna Sachse-Rynkowska 904

PART III: PLACES, TECHNOLOGIES AND RELATED FIELDS

Big data, apps, social networks and microblogs in urban planning and design

PLACE COMPETITIVENESS EXPRESSED THROUGH DIGITAL DATA. MEASURING THE PLACE ATTRACTIVENESS TRACKING THE GEOTAG DATA VISUALS
Milena Vukmirovic, Eva Vanista Lazarevic 914

ROOM BOOK 2.0 – BRING BACK THE INFORMATION TO ITS PLACE
Christoph Breser, Stefan Zedlacher 926

THE INTERCONNECTED OBJECT: ARE YOU AT HOME IN A NETWORK?
Kalina Ntampiza, Polina Zioga 936

THE INTERACTION TIME IN A NETWORKED SOCIETY
Danijel Baturina 944

GOOGLE EARTH AS A MICROWORLD
Milena Zindović 962

TRANSPARENCY OF SCALE: GEOGRAPHICAL INFORMATION PROGRAM (GOOGLE EARTH) AND THE VIEW FROM BEYOND
Pavle Stamenović, Dunja Predić, Davor Ereš 970

Geodesy and modern cartography

ROBUST ESTIMATION APPLIED TO GEODETIC DATUM TRANSFORMATION USING A METAHEURISTIC ALGORITHM
Mevlut Yetkin 979

THE STATE OF THE ART SURVEYING BY TECHNOLOGY OF THE TERRESTRIAL LASER SCANNING
Marko Pejić, Branko Božić, Verica Erić, Jelena Pandžić 987

ROLE OF CARTOGRAPHY IN MAKING A "SMART CITY": CASE STUDY OF INDJIJA
Dragutin Protić, Ivan Vučetić, Ivan Nestorov 995

MODERN CARTOGRAPHY IN PROJECT OF CENSUS
Maja Kalinić, Dragoljub Sekulović 1002

Mobility and technologies

PERSONAL RAPID TRANSIT – A SUSTAINABLE URBAN TRANSPORT SYSTEM
Ljupko Šimunović, Luka Novačko, Mario Ćosić 1011

FLIGHTPATH TO AN ENVIRONMENTAL FRIENDLY AIR TRANSPORT
Ivana Čavka, Olja Čokorilo, Slobodan Gvozdenović 1020

PRESERVATION OF PLACE-IDENTITY THROUGH URBAN TRANSFORMATIONS BASED ON SUSTAINABLE FORMS OF TRANSPORT
Miloš Kopić 1029

BELGRADE RIVERSIDE TRAFIC INTERCHANGES
Ksenija Stevanović, Milena Stevanović 1037

SUSTAINABLE URBAN MOBILITY PLANS IN EUROPE
Davor Brčić, Ljupko Šimunović, Marko Slavulj 1045

URBAN DEVELOPMENT IN BELGRADE IN THE CONTEXT OF GLOBAL TRENDS: CHANCES OF ILLEGAL HOUSING INTEGRATION
Biserka Mitrović, Miodrag Ralević, Branislav Antonić 1051

RE-THINKING INFRASTRUCTURE PROJECT FOR THE METROPOLIS: LABORATORY GRANADA
Juan Luis Rivas Navarro, Belén Bravo Rodríguez 1059

Public participation, e-governing and tehcnology

COMMUNITY PARTICIPATION AND GREEN INFRASTRUCTURES: A DELIBERATIVE EVALUATION METHOD
Saverio Miccoli, Fabrizio Finucci, Rocco Murro 1067

RESULTS OF INTRODUCTION OF PARTICIPATORY TOOLS IN URBAN PLANNING IN SERBIA – 7 CASE STUDIES
Ratka Čolić, Harald Mueller 1075

WAYS TOWARDS A CITY OF NEW TECHNOLOGIES
Miodrag Ralevic, Tatjana Mrdjenovic, Natasa Krstic, Djemila Beganovic 1083

PARTICIPATION OF CITIZENS IN TOWN PLANNING PROCEDURES IN NEIGHBOURHOODS WITH FORMER REFUGEE AND DISPLACED POPULATION IN PRIJEDOR, BOSNIA AND HERZEGOVINA
Rada Latinović 1090

THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN A VIRTUAL ORGANIZATION
Jelena Lukić 1098

TRANSPARENCY OF SCALE: GEOGRAPHICAL INFORMATION PROGRAM (GOOGLE EARTH) AND THE VIEW FROM BEYOND

Pavle Stamenović
Faculty of Architecture, University of Belgrade, bul. Kralja Aleksandra 73/II, pavle.stamenovic@gmail.com

Dunja Predić
Subventive Research Unit, Koppstrasse 24/19, 1160 Wien, dunja@subventive.com

Davor Ereš
Faculty of Architecture, University of Belgrade, bul. Kralja Aleksandra 73/II, davorer@gmail.com

ABSTRACT

A nine-minute film, directed by architects Charles and Ray Eames, "Powers of Ten" visualized for the first time the journey through the different scales of existence - from outer space to the space of the atom. This film inspired the Keyhole Project, which, twenty years later, became Google Earth, a (non) commercial online tool for surveying the surface of Earth, making those intriguing images from the 1970s part of our everyday life. Today, as Google Earth counts more than one billion downloads per year, Felix Baumgartner experienced zoom-out mode in physical space, launching himself into the stratosphere. This new overview of the planet that is provided to us by Google Earth virtually, Felix Baumgartner for the first time experienced in physical space; he sky-jumped from the height of estimated 39,000 m, proving that one can actually see the Earth as simulated by Google Earth. Humanity gained a new glance, an overview towards the territory of Earth. This paper argues that this transformation of the nature of the vista provokes the emergence of new modes of perception, cognition and experience of space and place specific to the emerging era (thus provoking new modes of production of space). This paper raises questions regarding the case of the Google Earth program and it's impact on spatial perception in the context of architectural discourse.

***Keywords**: perception, scale, territory, perspective, photography, virtual*

INTRODUCTION: PERCEPTION OF SPACE IN DIGITAL AGE

The paper argues the significance of the emergence of Virtual Globe platforms, i.e. of Google Earth, and its effect on spatial practice[246] regarding perception and the

[246] With this we take Henri Lefebvre's space and notion of multiplicity of space as a social product, or a complex social construction, which affects spatial practices and perceptions,

causal nature of the relationship between technology and society. The significance of Google Earth is seen beyond the mere utility of the software, as an important platform for determining the contemporary perception. New overview of Earth combined with complex layers of data, follows previous shifts in perception: the appearance of central perspective in the Renaissance and the rise of photography in Modern time. In this regard, the paper argues that the present mode of representation of space caused a latest shift in perception.

Until 20 years ago, architecture still held the apparatus and tools to conceive and perceive particular spatial ideas. But even further, the discipline of architecture held a sovereign position in projecting and imposing our spatial perception of the world. In today's digital age, characterized by user-friendly platforms for spatial manipulation, a shift in perception is inevitable; a shift from the world dominated by the architect as a master-designer of the image of space, to an age of prevailing micro-generated spaces[247] guided and maneuvered by consumers of open-ended platforms. These platforms promote interaction as a way of communication between actual and virtual[248], with an interface as the main surface of this interaction. The architectural principle of projection (conducted through drawings, plans and models) that provokes unitary perception is confronted with fragmentary individual interpretations of space.

Shifts in Perception: Multiplying Reality

In order to fully comprehend Google Earth beyond simplified notion of a new outlook upon reality, we should return to previous shifts in perception. In Renaissance, the 'invention' of linear perspective by Brunelleschi was more than improvement in technique of representation; for his contemporaries it was a manifestation and proof of the prosperity and inherent development of an enlightened and prosperous society. The new accurate model for representing reality was produced in order to more convincingly assure the viewer about the credibility of an architectural idea. Brunelleschi's 'invention' of perspective was the result of a constant quest for more and more convincing modes of three-dimensional visualizations. Linear perspective on a 2D surface seduces the viewer into believing a certain loss of 3D has been compensated. A wish for seduction has led us to insist upon the accuracy of representation [249]. However, this apparatus of 'seduction' produces 'side effects'

---

which implies the shift of the research perspective from space to processes of its production. See Henri Lefebvre (1992) *The Production of Space.*

[247] In this paper, the term micro-generated space refers to a personalized, customizable virtual space made possible by wearable technology, i.e. smart phone or tablet.

[248] According to Gilles Deleuze, the common dialectics between *actuality* and *possibility* must be replaced with putting *actual* and *virtual* as a dialectic pair, in order to pursue the notion that reality can never be fully, nor adequately represented. Gilles Deleuze (1994) *A Thousand Plateaus*, p. 211

[249] For Baudrillard, architecture of Las Vegas is trapped within depthless world of appearance, where everything is 'liquidated' and 'reabsorbed' into surface. Baudrillard sees this as logic of

which generate human sensitivity for distinction between real space and realistic two-dimensional space.

With the invention of linear perspective view as a way to seduce the observer, an image offers additional value of depth to the surface. As Baudrillard observes, this seduction starts to vanish with the advancement of industrial revolution, as the contemporary world starts to appear: 'Seduction [perspective] removes something from the order of the visible, while production [photograph] constructs everything in full view, be it an object, a number or a concept."[250] Instead of a concept of seduction, there was progressive "emphasis on production with its concern to make everything clear and objectifiable'[251]. A new era and a new shift in perception were therefore dominated by invention of a camera.

The first photograph was a photograph of architecture[252]. Although the intention to capture a moment probably came from the idea to photograph a person, architecture and photography kept on developing together in an alternating, causal sequence. At that time two types of architectural photography, both primarily of documentary character, were typical: elevation as representation of a drawing, i.e. facade and perspective as representation of volume.

Photography had an enormous effect on the development of modern architecture. Architecture and photography worked together to create the identities of contemporary man, the contemporary building, and the contemporary city. It wasn't just for the sake of documentation anymore. Together they caused a shift in the way in which architecture is seen, and therefore understood, promoted and advertised, and thus wanted. Images of architecture are used as statements and manifestos. They are used during the design process, as tools for conceptualisation, and in education, for the evaluation of work. Beatriz Colomina (1994) claims that photography, rather then the real location of buildings, was the genuine site of Modernism[253]. Photography is responsible for the disappearance of a localised approach to design and the emergence of the International style in architecture. Later on, this correlation between architecture and image brought us to the Bilbao Effect and secured the new role of urbanism in globalization.

---

seduction, which, as he defines, "is that which extracts meaning from discourse and detracts it from its truth". Real only remains true if we believe in fictions without functions. See Jean Baudrillard (1988) *Selected Writings*, ed. Mark Poster

[250] Ibid. p.190.

[251] See Neil Leach (2000) *The Anaesthetics of Architecture*, p.73

[252] *View from the Window at Le Gras* by Nicéphore Niépche from 1826/27, taken from his window in a village in Burgundy, France, is the oldest surviving photograph

[253] For further reference Beatriz Colomina (1994) *Privacy and Publicity: Modern Architecture as Mass Media*

Alluding to Jules Marey's photographic gun, Bruno Latour suggests that the biggest flaw of buildings (and photography for that matter) is their static nature.[254] 'Almost four centuries after perspective drawings and more than two centuries after the invention of projective geometry there is still no convincing way to draw the controversial space that a building almost always is. It is hard to believe that the powerful visualizing tools we now possess are still unable to do more than Leonardo, Duerer, or Piero. [...] We should finally be able to picture a building as a moving modulator regulating different intensities of engagement [...]'[255] Inside this phenomenon architects were compelled to adapt to techniques of a film director in relation to space, life scenario and construction of spatial possibilities.

Modernists placed great importance on the aerial view. Their relationship with zenithal perspective was described by Nadar[256], creator of the very first aerial photograph, who said that cities and landscapes, from above, look like a toy-land, inviting one to play[257]. Modernists assigned a negative connotation to the aerial view, as it depicted urban disorder, but at the same time they saw the aerial view as a perfect tool for this chaos to be arranged and controlled.

Figure 65: Earthrise - photograph by William Anders, NASA, 1968.

[254] Latour, B, Yaneva, A. *Give me a Gun and I will Make All Buildings Move: An ANT's View of Architecture* in: R. Geiser, ed. (2008) Explorations *in Architecture: Teaching, Design, Research*. Basel: Birkhäuser.
[255] Ibid. p. 80-89.
[256] French journalist, photographer and balloonist, Nadar, due to his passion for extending a view, made the first aerial photographs in 1858.
[257] See Tanis Hinchcliffe 'The Synoptic View': Aerial Photographs and Twentieth-Century Planning in: Higgott A, Wray T. Eds. (2012) *Camera Constructs: Photography, Architecture and the Modern City,* p.136

As a result of technological development due to both World Wars, the first photograph[258] from Space was taken in 1946. Images from the missile showed 'how our Earth would look to visitors from another planet coming in on a space ship'[259]. We finally gained the perspective we so desired, a *God's eye view*. One particular photograph changed the way we understand our world. A photograph named *Earthrise*, taken during the Apollo 8 mission in 1968 by William Anders, is considered the most influential environmental photograph ever taken. Although the intention of the mission was to see and understand the Moon, the real discovery was our very own home – Earth. As Robert Poole wrote in his book *Earthrise: How Man First Saw the Earth*, 'The space program, which was meant to show mankind that its home was only its cradle, ended up showing that its cradle was its only home.' It can be argued that this event could be considered as a turning point for the growing environmental awareness during the second half of 20th century until today, as well resulting in emergence of environmental discourse in architecture.

The same year Buckminster Fuller's book *Operating Manual for Spaceship Earth* is published. 'We are all astronauts' he writes, on Spaceship Earth. He continues to convince us of this astounding idea further, with an explanation of the relativity of scale: 'Our little Spaceship Earth is only eight thousand miles in diameter, which is almost a negligible dimension in the great vastness of space [...]'.[260] It was as if scale-fever had seized everyone in 1968. The movie *Powers of Ten*, by architects Charles and Ray Eames, had created a revolution in scale perception. The journey from the space we are familiar with, into outer space, and then back to the space of an atom did not leave anybody unaffected. The relativity of scale inspired a whole new set of research, projects and discoveries. In 1968 Constantinos Doxiadis's book *Ecumenopolis*[261]*: Tomorrow's City* was proclaimed Briattanica Book of the Year. Doxiadis, Greek architect and town planner collaborated closely with Buckminster Fuller and Marshall McLuhan.They used to meet regularly at the Delos Symposia[262],

---

[258] With the V-2 missile, developed by German engineers during the WWII for the purpose of destruction, later on appropriated by Allied Forces the first photo from Space was made in 1946.

[259] Clyde Holliday, the engineer who developed the camera, gave this description in *National Geographic* in 1950 (source: http://www.airspacemag.com/space/the-first-photo-from-space-13721411/ accessed on 02.02.2014)

[260] see Buckminster Fuller (1969), Operating Manual for Spaceship Earth, p15
Wittily, he is noticing that the manual for our spaceship is missing but we are all slowly but surely learning how to "anticipate the consequences of an increasing number of alternative ways of extending our satisfactory survival and growth - both physical and metaphysical."

[261] Ecumenopolis, from Greek: οἰκουμένη, meaning "world", and πόλις meaning "city", thus a city made of the whole world (source: http://en.wikipedia.org/wiki/Ecumenopolis accessed on 02.02.2014)

[262]The Delos Symposium was an international forum discussing human settlements. The idea emerged as a reaction to CIAM meetings, but the whole thing was taken to a different level. First of all it didn't stick only to architects as CIAM, but the experts from all the different fields were invited, secondly they didn't sit in front of the finished projects but in front of an empty black board, creating rather than reflecting, and thirdly it wasn't about obvious and visible, but

organized by Doxiadis and his team. Doxiadis's vision for the future, epitomised in Ecumenopolis, alerted us to what might happen if we don't understand the new circumstances; population growth and accelerated urbanization will slowly outgrow a human. He therefore proposed The City of the Future, an endless network covering the surface of the Earth, which will retain the human content and anthropometry, regardless of its size. Recently Doxiadis was honoured to be the first global planner[263]. In the 1970s his ideas were more of a science fiction, but today they are surprisingly pertinent, both in content and rhetoric. 'Today, more and more cities are not only becoming dynamic, but continuously dynamic, so that they never stop changing and growing. For the first time in history, settlements are not only three dimensional but four dimensional, since they exist continuously within the fourth dimension of time.'[264]

The End of Distance and the Hybrid State of Space

'The surface of the Earth has a thickness but it could not be considered a volume. The Earth's is a surface thickened by relations.[...] It always overflows any map that tries to frame it, because there are always more connections to be made.'[265]

The reduced, informational appearance of a (geographical) map is replaced with the hyper-real, graphically accurate simulation of the terrain in Google Earth. In this saturation of content, the characteristics and beauty of the landscape, its territorial borders and the socio-political character of the territory disappear, becoming relative, and set as secondary.

In his *End of geography* thesis, Kenichi Ohmae (1990) proclaims the end of nation-states and old cartography, announcing the death of distance and the triumph of technology over place- the annihilation of space with technology.[266] Vincent Mosco sees this as 'a story about a fundamental change in relationship to space and place', concluding that 'cyberspace is fundamentally different from geography as we know it, because this space is almost fully transparent with respect to communication'[267]. From today's perspective, one can argue that the relation between digital (cyber) and real space is symbiotic and causal, where former does not exclude the later. Today, the boundary between digital and real space has blurred, producing a hybrid terrain where *the digital* relies on *the real* for its means of conveyance, and *the real* relies on *the digital* for content and experience. The impact of this overlap of real and digital

---

absolutely the opposite – the intention was to reveal the invisible networks. (see Mark Wigley (2001) *Network Fever* in *Grey Room* No. 04, p. 82– 122.)

[263] See in Rem Koolhaas and Hans Ulrich Obrist (2011) *Project Japan: Metabolism Talks*

[264] See Constantinos Doxiadis (1974) Ecumenopolis: The Inevitable City of the Future, p7.

[265] Weizman, Eyal, *Forensic Architecture: Lexicon,* source: http://www.forensic-architecture.org/lexicon/

[266] See Kenichi Ohmae (1990) *Borderless World*. 'The old cartography no longer works. It has become no more than illusion.' p.19-20.

[267] See Vincent Mosco (2004) *Digital Sublime*, p.86.

on architecture is still not widely addressed, making a collective uncertainty about where digital technology fits in the architect's toolkit.

The case of Google Earth questions the fundamental role of architecture, and its aspiration to influence the perception of the world and the shaping of society. Confronted with this phenomenon, architects are facing the inevitability of hunt for new fields for action. For architecture in this case there is again the possibility of expansion of the scope and territories.

Conclusions

Through interpreting the appearance of linear perspective and photography as crucial shifts in perception, this paper argues that the virtual globe is a symptom of a crucial current change. Architects have acquired a new tool, which with each passing day, event or technological innovation is becoming more layered and complex. We will be able to access databases on commerce dynamics, real estate fluctuations, people and vehicle motion, natural disasters and much more, and to trace changes over time. Can the information overload be channelled and structured into useful knowledge? How can we understand the data we collect and how can we use it to generate tools for action?

At the same time, Google Earth offers a new set of possibilities for architects and a wider scope on their primary subject of desire: the surface (as a construction ground), giving architects a sense of expansion. Expansion in this sense raises a notion of scale with regard to new possibilities of a boundless surface. New transparency of scale, distance and topography has enabled a wider scope for architecture.

The contextuality of an architectural project therefore takes on a new, more complex sense in light of the accuracy of the satellite image. The new overview of the territory holds the promise of a new, accurate tool that can greatly simplify and inform the process of design. Despite this, the view from beyond is not merely a utilitarian device, but possesses the poetics of discovering new landscapes and perspectives. The territory of the planet is once more a field of exploration; using holistic optical apparatus for surfing over scales and datascapes, this exploration has no borders for obstacle.

References

Air & Space Magazine, The First Photo from Space, Accessed February 3, 2014 http://www.airspacemag.com/space/the-first-photo-from-space-13721411/

Colomina, Beatriz. 1994. *Privacy and Publicity: Modern Architecture as Mass Media*. Cambridge, MA: MIT Press

Deleuze, Gilles. 1994. *Difference and Repetition*, Paul Patton (trans.). London: Athlone Press.

Doxiadis, Constantinos. 1974. *Ecumenopolis: The Inevitable City of the Future*, New York: W.W Norton & Company.

Forensic Architecture, Lexicon, stable URL Accessed January 2, 2014. http://www.forensic-architecture.org/lexicon/surface-of-the-earth-eyal-weizman/

Hinchcliffe, Tanis. 2012. "The Synoptic View: Aerial Photographs and Twentieth-Century Planning" in *Camera Constructs: Photography, Architecture and the Modern City,* edited by Andrew Higgott and Timothy Wray, 135-146. Burlington: Ashgate Publishing.

Latour, Bruno, Albena Yaneva. 2008. "Give me a Gun and I will Make All Buildings Move: An ANT's View of Architecture." In *Explorations in Architecture: Teaching, Design, Research,* edited by Reto Geiser, 80-89. Basel: Birkhäuser.

Leach, Neil. 2000. *The Anaesthetics of Architecture*. Cambridge, MA: MIT Press

Mosco, Vincent. 2004. *The Digital Sublime: Myth, Power, and Cyberspace*. Chambridge: The MIT Press.

Ohmae, Kenichi. 1990. *The Borderless World: Power and Strategy in the Interlinked Economy.* New York: Harper Collins Publishing.

Wigley, Mark. 2001. "Network Fever" *Grey Room*, No. 04 (Summer): 82–122.