ABSTRACTS

SIGRADI2018

TECHNOPOLITICAS

PROGRAM AND ABSTRACTS BOOK

22th CONFERENCE OF THE IBEROAMERICAN SOCIETY OF DIGITAL GRAPHICS

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EDITORS

XXII INTERNATIONAL CONFERENCE
OF THE IBEROAMERICAN SOCIETY OF DIGITAL GRAPHICS

SIGRADI2018
TECHNOPOLITICAS
PROGRAM AND ABSTRACTS BOOK

INSTITUTO DE ARQUITETURA E URBANISMO
UNIVERSIDADE DE SÃO PAULO
THE IBEROAMERICAN SOCIETY OF DIGITAL GRAPHICS
NOVEMBER, 2018
SÃO CARLOS – BRASIL

http://www.sigradi2018.iau.usp.br

conference proceedings

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PRESENTANTION

Dear SIGraDi community,

Every year since 1997 we make a great effort to bring together the members of our Ibero-American Society of Digital Graphics and a different headquarters in Latin America makes the enormous commitment to organize our annual congress. Likewise, every year a growing number of members come to the call and make our community expand and renew, building a space to share and discuss the creative, scientific, expressive and technical possibilities of digital graphics (as Arturo Montagú, our founder, would say) but also other fields ranging from art to the most advanced technological developments, all in a basically interdisciplinary and collaborative context.

This year the challenge of organizing the XXII Congress was taken up by the Instituto de Arquitetura e Urbanismo of the Universidade de São Paulo, in São Carlos, Brazil, by the hand of its two chairs, David Sperling and Simone Vizioli. Returning to Brazil is always a pleasure for everyone and this time we are very motivated by the theme that summons us: "Technopolitics". It seems that we have never had a topic more in tune with a situation. Today we are undoubtedly facing a global and local panorama that forces us to ask ourselves about the political impact of our projects and about the policies implicit in our technologies. As Heinz Von Foerster said "we don't see that we don't see", our cognition and understanding of things and the world is limited, it has blind spots, and one of those blind spots is usually the political matrix of our technical practices and disciplinary actions. We often think that the work of the researcher or professional is covered with a halo of objectivity and neutrality, the same goes for our tools and methods. However, this blindness has long since ceased to be innocence and the crucial time has come to see what we do not see and to act accordingly.

In these years, SIGraDi held its meetings in Brazil (2000, 2004, 2009, 2012, 2015, 2018); Argentina (1997, 1998, 2003, 2011, 2016); Chile (2001, 2006, 2013, 2017); Uruguay (1999, 2014); Colombia (2010); Cuba (2008); Mexico (2007); Peru (2005) and Venezuela (2002). Always, in each event, the organizers have surprised and motivated us with topics that sought to participate in discussions located at the disciplinary and technological forefront, at the same time that they connected with the legacy accumulated during all these years of scientific and academic production. Simultaneously, SIGraDi has generated its own identity, rooted in local opportunities and problems, without ever losing contact with what is happening in the world, especially through collaboration and exchanges with our sister societies (eCAADe, ACADIA, CAADRIA and ASCAAD), as well as in the projection of our production in an increasingly open way and with greater scope from the availability of our articles in Cumincad and Blucher.

Digital technologies are increasingly ubiquitous and naturalized, which shows that this is not something new. In 1998, in an article in WIRED magazine, Nicholas Negroponte said, “Face it, the digital revolution is over. Today we live in a post-digital world, immersed in the fourth industrial revolution. A world that in a few years will be inhabited by digital natives, where the focus on the internal logics of the computational and its transpositions is replaced by a growing interest in the connections that these technologies establish with others, with cyberphysical systems, with technical-material systems or with our bodies and minds. A context of crisis of paradigmatic condensations where we are constantly deconstructing and redefining ourselves, entering the era of Cthulhucene in the words of Donna Haraway. In this context the concept of digital graphics seems a bit old-fashioned, but no more than that of computer-aided design (CAD). Without a doubt one of the future challenges will be how to discuss these issues and redefine ourselves without ceasing to be SIGraDi.

Our society is based on a heritage and a legacy of decades of work, but above all it is based on people and collectives who embody the common interests and searches of SIGraDi. We are part of something bigger than ourselves, something that surpasses and expands us, but that depends on each and every member of the community. In this sense, we invite everyone to get involved in the organization and management of SIGraDi. We are currently in the process of redesigning our virtual platforms and, therefore, in a process of reformulating our interactions and our contact with the public. At the same time, we are opening borders and deepening our international connections, which will result in a greater impact of our production. All this is accompanied by systematic work to improve the quality of articles and reviews, for which once again the participation of all is fundamental.

In 1997 we began a path full of satisfaction and curiosity, which makes us wait every year for this moment of meeting and collective reflection, of reunion and celebration. Now we also face challenges that we want to face together, because SIGraDi continues to grow and project itself into the future, because Latin America is the future.

Welcome to São Carlos!

Rodrigo Martin-Iglesias,

President of SIGraDi

"to politize the technology is the answer ... What was the question?"

(from the assertion of Cedric Price in a lecture given in 1966: "technology is the answer ... What was the question?")

Dear SIGraDi Community,

In accordance with the objectives of the Iberoamerican Society of Digital Graphics to contribute to the academic debate on digital media and its applications in the fields of architecture and urbanism, design and arts, and to boost research and education in the current context of technological transformations, our 22nd Conference takes on the theme of Technopolitics.

We understand that technologies are engendered within cultural, economic and social contexts, as well as they have political aspects in their conformation and their use. However, we are often confronted with positions that take the technologies as autonomous prefigurers of futures and as unequivocal solutions to problems not yet known.

How not return to the proposal of the sociologist Laymert Garcia dos Santos to "politicize the new technologies"? How not to think about technopolitics in the face of widely held consensus on a positive teleology of technologies, by taking up dissensus positions anchored in the philosophy of Jacques Rancière? Or, how not to consider, with Giorgio Agamben, a horizon of restitution of the devices to their common use? Or even, how not to look at technopolitics, according to Gabrielle Hecht and Paul N. Edwards, as hybrids of technical systems and political practices that produce new forms of power and agency?

In a world facing different crises and challenges, from social to political, from urban to environmental, from imagined spaces to constructed ones, technopolitics have been understood as practices of conception, revision and use of technological artifacts in the sense of their performance as common goods, in contrast to the dominant models of technological application.

Therefore, according to the approach proposed by this conference and based on the specificities and history of SIGraDi, the focus on digital technologies and their uses in architecture, design, the arts and related areas, intends to broaden the debate about access and information sharing, ways of doing, modes of participatory management, processes of decision-making and production of cities, as well as the enhancement of creative practices.

The Instituto de Arquitetura e Urbanismo da Universidade de São Paulo (IAU-USP) is honored to host the 2018 SIGraDi Conference strengthening its contribution not only to this debate, but also to this Iberoamerican Society. The IAU-USP, recognized for its excellence in teaching, research and extension activities, has been actively participating in SIGraDi since the early 2000s. Throughout this period, 90 research papers were presented by 11 of the 36 Institute's professors, and by 50 postgraduate and undergraduate students, that integrate four research groups (Núcleo de Estudos das Espacialidades Contemporâneas – NEC; Núcleo de Apoio à Pesquisa em Estudos de Linguagem em Arquitetura e Cidade - N.ELAC; Núcleo de Estudos em Habitares Interativos – Nomads; e Arquitetura, Tecnologia e Habitação - Arquitec).

This rich partnership has already been expressed in the contribution of the IAU-USP's professors to the various committees of SIGraDi and to the publication, since 2016, of the SIGraDi's annual edition of the Design Management & Technology Journal.

We thank all those who have made a commitment to the organization of this event and those who have accepted our invitation to participate in it. This year, 480 abstracts were sent to the blind peer review process - a record in the history of SIGraDi. In the next stage, 217 full papers were submitted for review, resulting in 154 published articles coming from 21 countries in the Americas, Europe, Asia and Oceania. In this process, a scientific commission of more than 160 researchers was responsible for the revision process and a large team of professors, students and non-teaching staff of the IAU-USP was active throughout this year.

When looking retrospectively, the conceptual hypothesis that we choose at the beginning of conference organization became increasingly clear and urgent in the context of this year events in Brazil, Latin America and the world. We believe that SIGraDi, aware of its scope, plays a relevant role at this time.

Welcome to São Carlos!

David M. Sperling and Simone Vizioli

Chairs of SIGraDi 2018

The Iberoamerican Society of Digital Graphics (SIGraDi) is the counterpart of similar organizations in Europe (ECAADE), North America (ACADIA), Asia / Oceania (CAADRIA) and West Asia and North Africa (ASCAAD). SIGraDi was born in 1997, with the first congress held in the city of Buenos Aires. Since then, it holds an annual congress in different institutions and countries of Latin America, where the latest applications and possibilities of digital technologies are debated, with the participation of relevant international experts.

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Theories and design practices in digital contexts
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Morphogenesis, synthesis and analysis of forms
Marcelo Bernal (Chile) and Wilson Florio (Brazil)

Manufacture and digital construction
Fernando García Amen (Uruguay), Gonçalo Castro Henriques (Brazil) and Mauro Chiarella (Argentina)

Information, models and simulations
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Anja Pratschke (Brazil) and Paula Gómez (Chile)

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Márcio Minto Fabrício (Brazil) and Rodrigo Martin-Iglesias (Argentina)

Creative industries and artistic practices
Mari Tosello (Argentina) and Mateus Stralen (Brazil)

Digital technologies and society
Leonardo Parra Agudelo (Colombia) and Ruy Sardinha Lopes (Brazil)

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NOVEMBER.18	MON.05	TUE.06
morning		
8h30-10h30	**accreditation** *salão primavera*	**workshops** *see location in specific programming*
10h30-11h00	**coffee-break** *pátio da pós*	**coffee-break** *salão primavera and pátio da pós*
11h00-12h30	**workshops** *see location in specific programming*	**PHD workshops** **workshops** *see location in specific programming*
12h30-14h00	**lunch**	**lunch**
night afternoon		
14h00-16h00	**workshops** *see location in specific programming*	**PHD workshops** **workshops** *see location in specific programming*
16h00-16h30	**coffee-break** *salão primavera and pátio da pós*	**coffee-break** *salão primavera and pátio da pós*
16h30-18h30	**workshops** *see location in specific programming*	**PHD workshops** **workshops** *see location in specific programming*
18h30	**DORON GOLDFARB** WORKSHOPS KEYNOTE SPEECH *jorge caron room*	**exhibitions openning** *see location in specific programming*
19h00		
23h00		

WED.07	THU.08	FRI.09
accreditation *salão primavera*	**thematic sessions** **(S8, S9, S10, S11)** *see location in specific programming*	**books launch** **journals infos** *joge caron room*
welcome coffee-break *salão primavera*	**coffee-break** *salão primavera*	**coffee-break** *salão primavera*
opening session **GISELLE BEIGUELMAN** KEYNOTE SPEECH *jorge caron room*	**FELIX STALDER** KEYNOTE SPEECH *jorge caron room*	**SEBASTIÁN ROZAS** **gt2P** KEYNOTE SPEECH *joge caron room*
lunch	**lunch**	**lunch**
thematic sessions **(S1, S2, S3, S4)** *see location in specific programming*	**thematic sessions** **(S12, S13, S14, S15)** *see location in specific programming*	**thematic sessions** **(S19, S20, S21, S22)** *see location in specific programming*
coffee-break *salão primavera*	**coffee-break** *salão primavera*	**coffee-break** *salão primavera*
thematic sessions **(S5, S6, S7)** *see location in specific programming*	**thematic sessions** **(S16, S17, S18)** *see location in specific programming*	**closing session** *jorge caron room*
welcome cocktail *frei damião restaurant*	**SIGraDi Annual party** *café 7 restaurant* **after party** *the blackbird pub*	

PROGRAM


FELIX STALDER BY DOMINIK LANDWEHR

Felix Stalder is Professor for Digital Culture and Network Theories at the Zurich University of the Arts, a member of the World-Information Institute and the Technopolitics Working Group, both in Vienna and one of the long-term moderators of <nettime>, an international mailing list. His work focuses on the intersection of cultural, political and technological dynamics, in particular on new modes of commons-based production, control society, copyright and transformation of subjectivity. Among his recent publications are “Digital Solidarity” (PML & Mute 2014) and “The Digital Condition” (Polity Press, 2018).

felix.openflows.com


GISELLE BEIGUELMAN BY LEILA PUGGI

Giselle Beiguelman researches the aesthetics of memory and develops projects of artistic interventions in the public space and with digital media. She is a professor at the Faculty of Architecture and Urbanism of the University of São Paulo (FAU-USP) and the author of several books and articles on contemporary nomadism and practices of digital culture. Her recent projects include Memory of Amnesia (2015), Odiolândia (2017) and the curatorship of Arquinterface: the city expanded by networks (2015). She is a member of the Laboratory for OTHER Urbanisms (FAU-USP) and the Interdisciplinary Laboratory Image Knowledge – Humboldt-Universität zu Berlin. Her works are in collections of museums in Brazil and abroad, such as ZKM (Germany), MAC-USP and MAR (Rio de Janeiro).

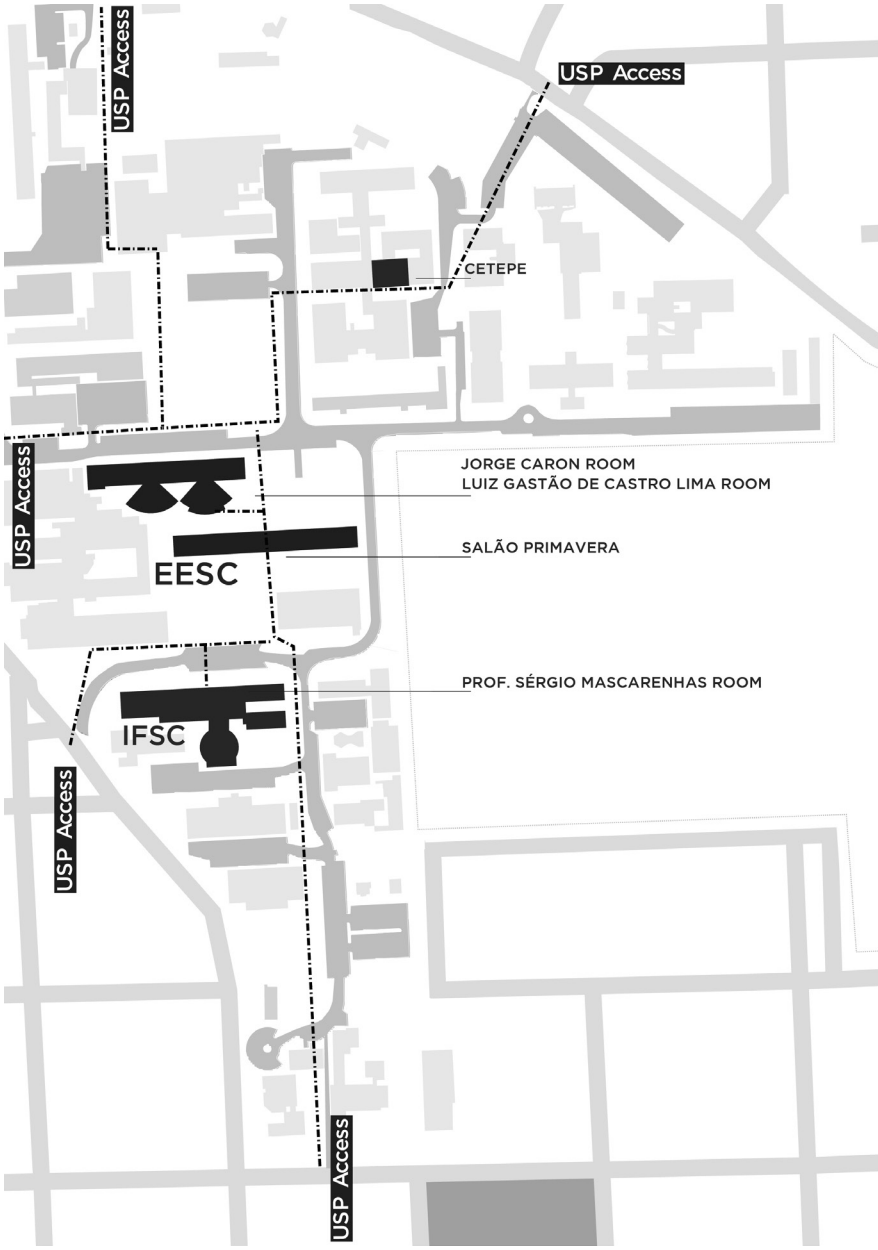
outrosurbanismos.fau.usp.br

desvirtual.com

gt2P (great things to People) is a studio involved in projects of architecture, art and design, established in Santiago, Chile. The studio is in a continuous process of research and experimentation in digital crafting, promoting new encounters between the technologies for projecting and the richness of the local expressed in traditional materials and techniques. Its work methodology has two dimensions. First, it seeks to systematize knowledge and observation, whether of natural, artificial, geometric or spatial, phenomena, through generative algorithms. Here parametric design is a tool to guide the planning of projects that the studio carry out, enabling the integration of its stages of design, development and production. On the other hand, GT2P have discovered an artistic dimension that connects itself with its cultural heritage, through the incorporation of traditional experience and knowledge that feed and qualify the generative algorithms or DNA that they create: “Exposing the unexpectedness of manual processes and local materials is a way to value what we are in what we do”.

gt2p.com

SESSIONS MAP



SESSION 1 | *JORGE CARON ROOM (see page 39)*

Session Coordinator: Miguel Roco Ibaceta

14h00 Conceptualizing the evolution of Tmor-Da

Yee Kee Ku; Michael Kirley; Justyna Karakiewicz; Yi Mo Jiang

14h15 Understanding the Genesis of Form in Brazilian Informal Settlements: Modelling the Environment as a Preliminary Approach to Design

Debora Verniz ; Danielle Oprean; José Duarte

14h30 Shape Grammar applied to Urban Morphology Studies: Land Subdivision in Urbanized Areas.

Moacir Cassiano; Lilian L. Félix; Cristiana Griz

14h45 Shape Grammar aAnd Social Housing: Recognizing Patterns in Favelas' Buildings

Margaret Lica Chokyu

15h00 Aplicability of 2d and 3d Isovists and Visibility Graph Analysis for Evaluating
Urban Vulnerability to Crime: The Case Of Boa Viagem, in Recife

Silvio Pereira Bezerra de Melo Junior ; Robson Canuto da Silva

15h15 The Use of UAV for Slums Land Regularization: Potentialities, Hindrances and Challenges

Marcel Fantin; Julio Cesar Pedrassoli; Guilherme Nelli Zaratine; Ivan Langone Francioni Coelho

15h30 DEBATE

SESSION 2 | *LUÍZ GASTÃO ROOM (see page 43)*

Session Coordinator: Ruy Sardinha Lopes

14h00 Critical Media. Proposals to articulate and activate devices of territorial transformation.

María Elena Tosello; María Georgina Bredanini Colombo ; Cecilia Verónica Zorzón; Marcelo Fabián Jereb

14h15 Open Design: Principles, Interfaces and Values Analysis

Bruno Massara Rocha; Camilo Simão de Lima

14h30 The Transposable Limits of Open Design for Sustainable Development

Rodrigo Argenton Freire; Evandro Ziggiatti Monteiro

14h45 The transformations of the "Do-It-Yourself" culture and the context provided by digital manufacturing in furniture design

Amanda Aline Alves de Oliveira ; Tatiana Sakurai

15h00 From DiY to DiWO: from Crafting to Digital Collaboration

Paula Ramos Pacheco; David M. Sperling

15h15 The Maker Culture and the Open Source Model in the Architecture, Urbanism
and Design Context: The Fabrication and Sharing of a Game for Design Teaching

Frederico Braida; Icaro Chagas; Isabela Ruback Cascardo de Almeida; Janaina M. de Castro

15h30 DEBATE

SESSION 3 | *PROF. SÉRGIO MASCARENHAS ROOM (see page 47)*

Session Coordinator: Gonçalo Castro Henriques

14h00 Cutting the Path: Encouraging Formal Exploration Through Integration Between Algorithmic and BIM Environments

Mário Guidoux Gonzaga; Leonardo Prazeres Veloso de Souza; Angélica Paiva Ponzio; Underléia Miotto Bruscato

14h15 Constructive-geometry: the integration of generation and construction systems in a case-study

Maria Elisa Regadas Reis Vianna; Gonçalo Castro Henriques; Andrés Martin Passaro

14h30 Parametric design of shells in reinforced concrete: a case study of the Los Manantiales

Camilla Ribeiro do Rozário; Felipe da Silva Tavares

14h45 Mathematizing Niemeyer's archiFtecture through parametric modeling: evaluating the parables of the Pampulha Church

Verner Max Liger de Mello Monteiro ; José Rauryson Alves Bezerra ; Paulo Roberto Paulino do Nascimento ; Erisvaldo Ramalho dos Santos Júnior

15h00 Brazilian Design: Parametric modeling as memory of vernacular artifacts

Rafael Mourão Fiuza; Leonardo Luna de Melo Jorge; Hugo Guimarães Sampaio; Daniel Ribeiro Cardoso

15h15 Generative design in the design development of metallic constructions

Renato Godoi da Cruz; Cláudia Maria Arcipreste; Rafael Lemieszek Pinheiro; Rovadávia Aline de Jesus Ribas

15h30 DEBATE

SESSION 4 | *CETEPE-EESC ROOM 01 (see page 51)*

Session Coordinator: Frederico Baida

14h00 Urban modeling for 3D GIS purposes from laser scanning: an implementation for university campus

Elaine Gomes Vieira de Jesus; Arivaldo Leão de Amorim; Natalie Johanna Groetelaars; Vivian de Oliveira Fernandes

14h15 Exploring Urban Interventions through Computational tools: genetic algorithm and urban connection patterns

Manoel Rodrigues Alves; Alvaro Martins Abdalla; Carlos Tapia

14h30 The Virtual Reality as a tool to analyze modifications in the architecture of the city. Case study: the historical center of the city of Belém-Pará.

Emerson Bruno de Oliveira Gomes; Rodrigo Carlos da Silva Machado; Cristiani Machado Gomes; Luis Gustavo de Souza Xavier

14h45 Digital approaches for evaluating urban indicators: an application of CityMetrics for analysis of two neighborhoods in Juiz de Fora, Brazil

Luiza Vallone; Frederico Costa; Lucas Scafutto; Fernando Lima

15h00 A graphic code, one hundred architectural projects

Alejandro Folga; Fernando García Amen

15h15 Emerging ecosystems of information and city: Anglo digital repository

Marcos Lafluf Cuevas; Gabriela Barber Sarasola; Fernando García Amen

15h30 DEBATE

SESSION 5 | *JORGE CARON ROOM (see page 55)*

Session coordinator: Mateus van Stralen

16h30 Towards Urban Densification: Parametric Modeling of Possible Scenarios for Urban Mobility
Marcela Noronha Pinto de Oliveira e Sousa; Maria Gabriela Caffarena Celani

16h45 Computationally Analyzing Biometric Data and Virtual Response Testing in Evaluating Learning Performance of Educational Setting Through
Saleh Kalantari; Jesus Cruze-Garza; Pamela Banner; Jose Luis Contreras-Vidal

17h00 Fuzzy set theory for parametric design: A case study of non-standard architectural practice in China
Sining Wang; Kristof Crolla

17h15 Bio-inspired parametric textures applications in academic design projects
David Andrés Torreblanca Díaz

17h30 Responsive Architecture in Open Spaces – Interaction between man, object, place and landscape
Arthur Stofella; Carlos Eduardo Verzola Vaz

17h45 Use of Hygroscopic Responsive Wood Prototype for Teaching Performative Architecture
Gladys Ilka Klein Taparello; Patrícia Turazzi Luciano; Carlos Eduardo Verzola Vaz

18h00 DEBATE

SESSION 6 | *LUÍZ GASTÃO ROOM (see page 59)*

Session coordinator: Ruy Sardinha Lopes

16h30 Horizontal dialogues and open data: the communication spaces of bottom-up urbanism
José Eduardo Calijuri Hamra

16h45 Anamorphic Art as an Urban Intervention Strategy
Jéssica Rabito Chaves; Gilfranco Medeiros Alves

17h00 Urban Kindness: Parametrization and digital fabrication powering forgotten spaces
Mayara Dias de Souza; Gilfranco Medeiros Alves; Natália de Andrade Corrêa

17h15 Hybrid technopolitics for a collective construction
Patricia Muñoz; Analía Sequeira; María Varela

17h30 Temporary shelter design from a digital-analog design process: Habitable emergent solution for operational resilience
Renato Arturo Lemus Villagómez; Juan Carlos Lobato Valdespino

17h45 Architects and refugee camps: a case study for bottom-up approaches
Diogo Ribeiro Carvalho; Taynara Vieira Deiró

18h00 DEBATE

SESSION 7 | *PROF. SÉRGIO MASCARENHAS ROOM (see page 63)*

Session coordinator: Anja Pratschke

16h30 Challenges of implementing Building Information Modeling (BIM) in the Construction Industry

Beatriz Vonsovicz Zeglin; Angélica Mufato Reis; Lizandra Garcia Lupi Vergara

16h45 Identification of applicable patterns to algorithmization in BIM to explore solutions in the design stage of Social Housing

Giovanna Tomczinski Novellini Brígitte; Regina Coeli Ruschel

17h00 Generative housing: a shape grammar to design and to build social houses

Cristiana Griz; Thaciana Belarmino; Julia Dutra; Jeane Karlla Barbosa

17h15 Designers of the XXI century: BIM software programming and the development of new competencies

Juliano Lima da Silva; Andréa Quadrado Mussi; Thaísa Leal da Silva; Paola Zardo

17h30 Digital scanning and BIM modeling for modern architecture preservation: the Oscar Niemeyer's Church of Saint Francis of Assisi

Camila Kimi Cogima; Pedro V. V. de Paiva; Eloisa Dezen-Kempter; Marco Antonio G. De Carvalho

17h45 Collaborative or adversarial production and BIM: a method for better understanding of contracting types, based on BPMN

Ana Beatriz de Figueiredo Oliveira; Marcelo Eduardo Giacaglia

18h00 DEBATE

SESSION 8 | *JORGE CARON ROOM (see page 67)*

Session coordinator: Gabriela Celani

8h30 Robotic Connections: Customisable Joints for Timber Construction
Mikayla Heesterman; Kevin Sweet

8h45 The fabrication and application of parametric inflatable structure
Hsu Yi Chia; Hsu Pei Hsien

9h00 Digitally Fabricating Expandable Steel Structures Using Kirigami Patterns
Foroozan Danesh Zand; Ali Baghi; Saleh Kalantari

9h15 Fused Deposition Modelling Formworks for Complex Concrete Constructions
Roberto Naboni; Luca Breseghello

9h30 Kerf bending: ruled double curved surfaces manufacturing
Mara Capone; Emanuela Lanzara

9h45 Plant-inspired Kinetic Systems for Architecture
Maia Zheliazkova; Biliana Savova; Roberto Naboni

10h00 Geometry from 3D Photogrammetry for Building Energy Modeling
Mohammad Alawadhi; Wei Yan

10h15 DEBATE

SESSION 9 | *LUÍZ GASTÃO ROOM (see page 71)*

Session coordinator: Paulo César Castral

8h30 Techno-political strategies and tools to increase interdisciplinary collaboration and community participation around public health policy and the built environment
Mario Yadir Rendón Sallard; Elsa Concepción Cornejo Vucovich

8h45 Digital Governance and Cybernetics
Gilfranco Medeiro Alves; Carolina Martinez Vendimiati

9h00 Simplifica Extension Project: Salvador georeferenced database
Lucas Figueiredo Baisch

9h15 Digital platforms for urban mobility
Luísa da Cunha Teixeira; Rodrigo Cury Paraizo

9h30 Internet of Things Technology and Policy in Belo Horizonte Public Transportation System
Marcelo Maia; Jéssica Borges; Michele Brito; Ana Isabel de Sá

9h45 Participatory processes in the contemporary city: what is the role of Information and Communication Technologies?
Vítor Domício de Meneses; Daniel Ribeiro Cardoso

10h00 DEBATE

SESSION 10 | *PROF. SÉRGIO MASCARENHAS ROOM (see page 75)*

Session coordinator: Joubert José Lancha

8h30 Language design for modelling: a cognitive approach
Gustavo Henrique Montesião de Sousa

8h45 Animation and Prototyping as Tools for Teaching Project in Architecture
Patrícia Turazzi Luciano; Carla Cristina Secchi; Carlos Eduardo Verzola Vaz

9h00 Digital and physical models in graphic representation teaching: a didactic experience
Luciana Sandrini Rocha; Taís Feijó Viana; Tatiane Brisolara Nogueira

9h15 Learning Math and Digital Prototyping with Mobile Digital Fabrication Lab
Júlia Pereira Steffen Muniz; Regiane Trevisan Pupo

9h30 Type in motion: The representation of the illocutionary force through the expression of the kinetic typographic form
María Cecilia Brarda

9h45 The use of parametric modeling and rapid prototyping in teaching graphic expressio
Leticia Teixeira Mendes; Elton Cristovão da Silva Lima; Cristiana Griz

10h00 TICs in the Geometry Education: Proposals for Change the Content Approach
Bianca M. F. Leal; Mônica Santos Salgado

10h15 DEBATE

SESSION 11 | *CETEPE-EESC ROOM 01 (see page 79)*

Session coordinator: Márcio Minto Fabrício

8h30 User-centered shape grammars for housing transformations: towards post-handover grammars
Sara Eloy; Maria Ângela Dias; Pieter E. Vermaas

8h45 Furniture kits and physical model as a tool for visualization of the minimum residential spaces according to the anthropometric ergonomics
Luana Peroza Piaia; Alice Theresinha Cybis Pereira; Carla Cristina Secchi

9h00 From the automated generation of layouts to fabrication with the use of BIM: a new agenda for Architecture in the 21st century
Verley Henry Côco Júnior; Gabriela Celani

9h15 Proposal of a Process of Mass Customization of Kitchen Cabinetry
Miguel PereiraStehling; Regina Coeli Ruschel

9h30 Immersive virtual reality device to support the housing design process
Marcio Presente de Souza; César Imai; Maurício Hidemi Azuma

9h45 Mass Customization: a critical perspective on parametric design, digital fabrication and design democratization
Mateus van Stralen

10h00 DEBATE

SESSION 12 | *JORGE CARON ROOM (see page 83)*

Session coordinator: David M. Sperling

14h00 Aesthetics of Resolution. A postdisciplinary approach to countering the technocapitalist black box
Gerald Nestler

14h15 The Invisible Around: Art And Informational Space [The Unstable Place]
Lucas Bambozzi

14h30 Hidra System(!) in the tension between Internet of Things and Virtual Reality: programming meta-objects
Sandro Canavezzi de Abreu

14h45 Participation and contemporary spatialities: new technologies of social agency
Rafael Goffinet de Almeida; Fábio Lopes de Souza Santos

15h00 Emerging senses from Smart Cities phenomenon
Bruno Massara Rocha; Katherine Santo Athié

15h15 Between the Cloud and the Concrete: The Data Center as a cybernetic Heterotopia
João Luiz Pestana Junior; Naylor Barbosa Vilas Boas; Rodrigo Cury Paraízo

15h30 DEBATE

SESSION 13 | *LUÍZ GASTÃO ROOM (see page 87)*

Session coordinator: Pablo Herrera

14h00 Artisans and Digital Craft in Latin America: The contribution of architects to their creativity and production
Pablo C. Herrera

14h15 Technological appropriation and socio-technical adequacy in South America: applications of digital fabrication in architecture and design
Rodrigo Scheeren; David M. Sperling

14h30 Coastal Fog Tower – Design and Fabrication Process of a Vertical Fog Capture Device
Alberto Fernández González; Susana Ortega Gómez

14h45 A Shelter in extreme environments: Prototyping of the riverine house in the Amazon
Jair Antonio de Oliveira Junior; Arthur Hunold Lara; Célia Regina Moretti Meirelles

15h00 Digital-Analogic Algorithmic Laminar Artifact: Technopolitical convergences in Design
Patricia Muñoz; Rodrigo Martin Iglesias

15h15 High-Low as expression of the Brazilian digital fabrication
Daniel Locatelli; Adalberto de Paula; Thiago Henrique Omena; Arthur Lara

15h30 DEBATE

SESSION 14 | *PROF. SÉRGIO MASCARENHAS ROOM (see page 91)*

Session coordinator: Rodrigo Martin Iglesias

14h00 Informed Matter, Design and its Relationship to Force Dynamics
Juan Manuel Villa Carrero; Álvaro Maldonado Montagut

14h15 About (relatively) common operations in digital architectures
Fábio Lima

14h30 Digital morphogenesis and tectonics: an analysis of Peter Eisenman's Aronoff Center
Rafael de Albuquerque Montezi; Simone Helena Tanoue Vizioli

14h45 From object to process; conceptual matrices in architecture's expanded field
Adriana R. R. Lima; Rafael A. C. Perrone

15h00 White Cube in Evolution: Lighting and Digital Technology in Beyeler Foundation Architecture
Carolina Fialho Silva

15h15 Towards a democratic approach on public lighting: remote systems based on Metadesign
Gabriela Correia Fernandes; Rovenir Bertola Duarte; Beatriz Ferreira de Oliveira; Giovana MedriStriquer Souza

15h30 DEBATE

SESSION 15 | *CETEPE-EESC ROOM 01 (see page 95)*

Session coordinator: Paula Gomez-Zamora

14h00 Representation of architectural cultural exchange in Rio de Janeiro using augmented reality
Rodrigo Cury Paraizo; Maria Cristina Nascentes Cabral; Maria Clara de Oliveira Coura; Cíntia Mechler de Carvalho

14h15 Virtual Paths: Collaborations in Narratives of Cultural Heritage of São Carlos-SP
Sandra Schmitt Soster; Anja Pratschke; Maria Vitória do Nascimento Inocêncio; Maria Clara Cardoso

14h30 Content mediation and digital technology in museums: design strategies to enrich the visitor's experience
Diego Enéas Peres Ricca; Dra. Clice de Toledo Sanjar Mazzilli

14h45 Use of digital technology in museums: the knowledge construction about art mediated by artificial intelligence
Diego Enéas Peres Ricca; Clice de Toledo Sanjar Mazzilli

15h00 Use of Dense Stereo Matching for Existing Building Documentation: Comparative Analysis of Tools
Alana Bomfim de Araujo; Natalie Johanna Groetelaaars; Arivaldo Leão de Amorim

15h15 BIM and Aerial Photogrammetry: building documentation of E1 - USP São Carlos
Júlio César Franco Júnior; Heliara Aparecida Costa; Márcio Minto Fabrício

15h30 DEBATE

SESSION 16 | *JORGE CARON ROOM (see page 99)*

Session coordinator: Marcelo Bernal

16h30 PZ Smart Flooring System:Spatiotemporal Occupancy Analyses for Architecture
Paula Gomez-Zamora; Matthew Swarts; Ilan Stern; Francisco Valdes

16h45 Pilot study of numerical modeling tool to evaluate the thermal performance of walls according to Brazilian standards
Sthefane Adrielly Barbosa Cabral; Carlos Alejandro; Natália Queiroz

17h00 Thermal Comfort Clustering; Climate Classification in Colombia
Roland Hudson; Rodrigo Velasco

17h15 Noise Solver for Refurbishment Construction Site Design
Ugo Maria Coraglia; Gabriel Wurzer; Antonio Fioravanti

17h30 Design synthesis and performance: simulation, discussion and generative strategies
Thiago Silva; Juliana Lima; Nicole Maia; André Araujo

17h45 DEBATE

SESSION 17 | *LUÍZ GASTÃO ROOM (see page 103)*

Session coordinator: Maria Elena Tosello

16h30 Technopolitics and participatory processes - Interactions between digital networks and streets in Lisbon
Ana C. C. Farias; Alexandra Paio

16h45 IndAtlas - Technopolitic platform for urban investigation
Michele Brito; Ana Isabel de Sá; Jéssica Borges; Natacha Rena

17h00 Speculative cartography and the formation of public interest issues
Clorisval Pereira Jr.

17h15 Museum of the Underway Artists - Metanarratives on Networks
Cássia Hosni; Didiana Prata; Erica Ferrari; Nathalia Lavigne

17h30 Urban digital simulators as knowledge catalysts: a case study on the soundscape of Rio de Janeiro city center
Marcio Nisenbaum; Naylor Vilas Boas; José Ripper Kós

17h45 BIM and Public Bidding in Brazil
Eduardo Sampaio Nardelli

18h00 DEBATE

SESSION 18 | *PROF. SÉRGIO MASCARENHAS ROOM (see page 107)*

Session coordinator: Simone Helena Tanoue Vizioli

16h30 Industry 4.0 and the Civil Construction in Brazil
Elza Luli Miyasaka; Márcio Minto Fabricio; Ingrid Paoletti

16h45 The Use of High Low Architecture in the Creation of Alternative Construction Elements
Lucas Duarte Martins; Marina Ferreira Borges

17h00 Thinking the fabrication of complex components in nowadays context
Elza Luli Miyasaka; Ingrid Paoletti; Márcio Minto Fabricio

17h15 Optimization of a constructive system of subtractive digital fabrication: Prototypes and tests os fitting system
Eduardo Luisi Paixão Silva Campolongo; Charles C. Vincent

17h30 WikiHouse: A Generative and parametric tool to customize curved geometries
David Mendonça; Andrés Passaro; Gonçalo Castro Henriques

17h45 Research pavilions: contributions to the advancement of digital technologies, tectonics and materials in architecture
Wemerson Silva Soares; Ivvy Pedrosa Cavalcante Pessôa Quintella; Eduardo Quintella Florêncio

18h00 DEBATE

SESSION 19 | *JORGE CARON ROOM (see page 111)*

Session coordinator: Anja Pratschke

14h00 Architectural Design Digital Change: Interactivity policy
Ricardo Mendes Correia; Alexandra Paio; Ana Luísa Soares

14h15 Perceive to learn to perceive: an experience with virtual reality devices for architecture design learning
Guilherme Nunes de Vasconcelos; Mateus de Sousa Van Stralen; Alexandre Menezes; Fernando Murilo Gontijo Ramos

14h30 Connect, Motivate, Communicate: A Foundation for Gamification in Planning Communication
Sarah Louise Jenney; Michael Mühlhaus; Frank Petzold

14h45 The Use of Multi-Software in Undergraduate Architectural Design Studio Education: A Case Study
Asli Agirbas

15h00 The creative process in architectural design on a digital environment: an experience with beginner students
Sérgio Dias Maciel; Arivaldo Leão De Amorim; Érica De Souza Checcucci; Kyane Bomfim Santos

15h15 Creating Non-standard Spaces via 3D Modeling and Simulation: A Case Study
Asli Agirbas

15h30 DEBATE

SESSION 20 | *LUÍS GASTÃO ROOM (see page 115)*

Session coordinator: Underléa Bruscato

14h00 The future of architects' digital records: how to preserve algorithmic design?
Maycon Sedrez; Jarryer de Martino

14h15 The Inclusion of decentralized and self-organized system in the process of construction of design thinking
Adriana Edith Granero

14h30 Mapping Design Processes Based on Intense Use of Digital Technologies
Paola Zardo; Andréa Quadrado Mussi

14h45 Virtual Reality as a tool to regain tactual procedures in digital design
Tales Lobosco

15h00 Geodesign: A metametodology in the teaching of the project process in the School of Architecture and Urbanism of the UFPE
Maria Augusta Rodrigues de Holanda; Patrícia Porto Carreiro

15h15 DEBATE

SESSION 21 | *PROF. SÉRGIO MASCARENHAS ROOM (see page 119)*

Session coordinator: Adriane Borda

14h00 Teaching BIM modeling in the architecture course: using a Blended Learning Strategy

Ana Regina Mizrahy Cuperschmid; Caio Magalhães Castriotto

14h15 A comparative diagnosis of students' proficiency in BIM in construction-related graduate programs in Brazil and in the United States

Aline Valverde Arrotéia; Daniel Paes; Javier Irizarry; Silvio Burrattino Melhado

14h30 CAD and BIM tools in Teaching of Graphic Representation for Engineering

Beatriz Campos Fialho; Heliara A. Costa; Louise Logsdon; Márcio Minto Fabrício

14h45 Facade hollow brick (cobogó) 3D scanning: natural light admission analysis and comparison with original digital 3D model.

Cristian Vinicius Machado Fagundes; Cauê Duarte Costa; Fábio Pinto da Silva; Underléa Miotto Bruscato

15h00 Impressions of a touristic route: between the null-dimensional and the three-dimensional

Adriane Borda Almeida da Silva; Cristiane dos Santos Nunes; Stefani Curth Goulart; Bethina Harter Silva

15h15 DEBATE

SESSION 22 | *CETEPE-EESC ROOM 01 (see page 123)*

Session coordinator: Luciano Bernadino da Costa

14h00 herm3TIC-tv: Prototype of a human and social sciences laboratory based on Deleuze-Guattari philosophy and the application of the new ICT

Manuel Cebral Loureda

14h15 A window to the autism: the political role of the difference of an objectile in the homogeneous school

Rovenir Bertola Duarte; Ayla Ziger Dalgallo; Maria Luisa Consalter Diniz; Thais Romão Magoga

14h30 Potential use of Internet of Things to support Life Cycle Assessment of buildings

Natália Nakamura Barros; Regina Coeli Ruschel

14h45 Wearable Technology: Healthcare Product Design for Participation of Tetraplegics in Society

Anelise Ventura; Renato Varoto; Alberto Cliquet Junior

15h00 Drones, an air panopticon?

Diego Pimentel; Mariano Cataldi; Gonzalo Muñiz; Néstor Barbitta

15h15 DEBATE

ABSTRACTS

SESSION 1

JORGE CARON ROOM (EESC.USP)
07/11/18 14h00
SESSION COORDINATOR **MIGUEL ROCO IBACETA**

Information, models and simulations

Conceptualizing the evolution of Tmor-Da

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The urban dynamics observable in an informal settlement are akin to the characteristics of a complex adaptive system. In this paper, we describe an Agent-Based Model designed to simulate the urban dynamics of an informal settlement, Tmor-Da, in Phnom Penh, Cambodia. The overarching goal was to understand the possible rules that guided the development of built forms and the use of residue spaces in Tmor-Da. A series of simulation experiments were used to examine alternative hypotheses derived from field work and desktop analysis related to morphological changes associated with spatial units, including homes, shops, the orphanage, church and temple. The results suggest that the complex, emergent patterns encapsulated within the informal settlement could be reproduced in a simulation model. We conclude that our model can be used as an investigative tool to explore the most plausible factors contributing to the evolutionary trajectory of an informal settlement.

Keywords: Informal settlement; Urban evolution; Urban morphology; Agent-based model; Complex adaptive system.

Information, models and simulations

Understanding the genesis of form in Brazilian informal settlements: modelling the environment as a preliminary approach to design

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This work is part of a larger research that proposes an alternative approach to housing for low-income people, based on the model of Brazilian favelas, with the goal of generating housing solutions that are more adapted to physical conditions, affordable, and spatially rich. This paper presents how the favela Santa Marta (Rio de Janeiro, Brazil) was modeled through three types of models: digital, immersive and computational/ analytic model. The argument is that by using a more holistic modelling, it is possible to gain a deeper understanding of the genesis and formal structure of informal settlements and develop better approaches for tackling related challenges.

Keywords: Informal settlements; Santa Marta; modelling the environment; shape grammar; virtual environment.

Morphogenesis, synthesis and analysis of forms

Shape Grammar applied to urban morphology studies: land subdivision in urbanized areas

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Currently, the land regulation plans define the urban micro-scale, producing standardized and pre-dimensioned blocks and lots, generating monotony, poor urban quality and high infrastructure costs. In the quest for sustainability, studies point to a density and a certain degree of population density to enable urban infrastructures with qualitative and quantitative gains, through concepts of compactness, completeness and connectivity. This study presents possibilities of batch sizing using the Grammatical method of the Form, through morphological configurations and rules presents possibilities of generation of new formats, distribution of urban lots in the neighborhood Valentina, in João Pessoa - PB and discusses results.

Keywords: Urban Lots; Shape Grammar; Sustainability; Urban Density.

Morphogenesis, synthesis and analysis of forms

Shape Grammar and Social Housing: recognizing patterns in favelas' buildings

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Social Housing is worldwide problem, especially in underdeveloped countries. In Brazil, people do solve this issue with self-made houses, in irregular land occupations. As a result, those informal settlements, also known as favelas, proliferate in medium and big cities all over the country, in very poor infrastructure. On the other hand, governmental policies for social housing development are often criticized, because of several reasons, including architectural design, frequently unfit for the families assisted. The present work observes the architecture developed in self-made houses at Favela da Rocinha and presents Shape Grammar as an instrument for analysis of frequent solutions, in order to provide data for adequate architectural design.

Keywords: Shape grammar; Favelas; Informal architecture, Teaching observation.

Morphogenesis, synthesis and analysis of forms

Aplicability of 2D and 3D isovists and visibility graph analysis for evaluating urban vulnerability to crime: the case of Boa Viagem, in Recife

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This work aims to investigate the applicability of 2D and 3D isovists, as well as Visibility Graph Analysis (VGA), for evaluating urban vulnerability to crime. The methodology is based on correlations between number of crime occurrences and measurements of 2D and 3D isovists, and mean values of visual integration (VGA). The 2D isovists were produced through DeCoding Spaces Toolbox for Grasshopper and the 3D isovists were generated by using algorithms within Rhinoceros and Grasshopper. VGA maps were elaborated within DepthmapX. For this study, were selected nine street segments of Boa Viagem, located in Recife-PE, a neighbourhood which is known for high rates of robberies. Although the number of samples is reduced, the results suggest that criminals prefer much more visually integrated spaces with low occlusivity and fewer spatial cavities.

Keywords: criminality; isovist; parametric; urban space; space syntax.

SESSION 1

Information, models and simulations

The use of UAV for slums land regularization: potentialities, hindrances and challenges

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The use of Unmanned Aerial Vehicle (UAV) can contribute significantly to land regularization activities of slums. This article seeks to demonstrate the potential use of UAV in slums land regularization, as well the hindrances and the challenges considering the normative aspects and the scientific and technological research associated to this type of aerial photogrammetric survey in Brazil. It is concluded that the standardization and scientific researches developed to date are far removed from the discussions about the right to housing, seek, in their vast majority, to meet demands associated with the interests of large capital, especially agribusiness.

Keywords: Photogrammetry; Unmanned Aerial Vehicle; Land regularization.

SESSION **2**

LUIZ GASTÃO DE CASTRO LIMA ROOM (EESC.USP)
07/11/18 14h00
SESSION COORDINATOR **RUY SARDINHA LOPES**

Digital technologies and society

Critical Media. Proposals to articulate and activate devices of territorial transformation

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This paper discusses the aims of media and technologies from a political insight, knowing the shortcomings and contradictions that cross the Latin American countries, for the purpose of being able to visualize them, think them and provide possible solutions, taking advantage of the creative potential of the university. With this objective, we developed an experience that integrated a research project on the design and production of artifacts, interfaces and representations capable of articulating the links between subjects, actions and dimensions, with the teaching and learning processes of an interdisciplinary design workshop, that created and activated territorial transformation devices with a sense of community collaboration.

Keywords: Digital Media; Critical Theory; Participative Design; Collaborative Design; Learning Process.

Digital technologies and society

Open Design: Principles, Interfaces and Values Analysis

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This article discuss in which terms design, distribution and production processes have changed after the great technological revolution in a post-industrial era in order to become more democratic and easily shared. After a brief analysis of the economic impact brought by this digital revolution, the article presents newly design values and production environments that emerged from it. We focus in the Open Design movement to show how its process introduce new ways to create and produce architecture. The main idea is to enlighten and explain how Open Design enhances innovation and foster a new democratic practice based on freedom, collaboration and experimentation.

Keywords: Shared project; Open design; Maker movement; Digital fabrication; Cognitive capitalism.

Digital technologies and society

The Transposable Limits of Open Design for Sustainable Development

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In this study, we defined a set of parameters to evaluate openness, social inclusiveness, economic viability and environmental responsibility in Open Design (OD) Projects. We compared the parameters of eight OD cases of different nature and scale related to the built environment. We identified current limitations to the application of OD in developing countries and developed a set of recommendations to improve openness and guarantee sustainable practices. Results show that social inclusiveness is limited to the existence of digital fabrication tools and collaboration platforms, there is a lack of information concerning environmental aspects and there are positive perspectives for local businesses and job creation.

Keywords: Open Design, Democratic Design, Open Hardware, Open Architecture

Digital technologies and society

The transformations of the "Do-It-Yourself" culture and the context provided by digital manufacturing in furniture design

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This article seeks to deal with the evolution of the DIY culture during its most important periods for the history of furniture and confers great importance to the present reality that provides the constitution of these artifacts through digital manufacturing. Thus, issues such as the quality of what has been produced and even the relevance of design professionals of the culture of making in the digital era are treated.

Keywords: DIY; Digital fabrication; Furniture; Fab Labs Livres SP.

Digital technologies and society

From DiY to DiWO: from Crafting to Digital Collaboration

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Cultural changes based on recent development of information technologies suggests that knowledge could be spread with less control and greater accessibility, allowing the emergence of communities that launch alternatives like, for example, networks of laboratories for manufacturing. However, similar ambitions regarding the creation of alternatives to industrial production can be identified in the countercultural context of the 1960s and 1970s. This article traces some comparisons between these two historical moments with the goal of investigate how do-it-yourself (DiY) appears (again) in the design scene today as do-it-with-others (DiWO), establishing approximations and distances between two selected objects of study.

Keywords: Open Design; Collaboration; Do-it-yourself; Do-it-with-others; Maker Movement

Digital technologies and society

The Maker Culture and the Open Source Model in the Architecture, Urbanism and Design Context: The Fabrication and Sharing of a Game for Design Teaching

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This article aims to present a discussion about the maker culture and an experience of fabricating and sharing a set of building blocks designed as a didactic tool for teaching architectural design within the premises of do-it-yourself culture and an open source model. Methodologically, the article is the result of both a bibliographical research and an empirical research, from which, in contemporary times, is evidenced the strengthening of flexible, collaborative, creative and innovative processes, prevailing premises in the maker movement.

Keywords: Maker culture; Open source; Teaching; Democratization; Digital culture.

SESSION 3

PROF. SÉRGIO MASCARENHAS ROOM (IFSC.USP)
07/11/18 14h00
SESSION COORDINATOR **GONÇALO CASTRO HENRIQUES**

Theories and design practices in digital contexts

Cutting the Path: Encouraging Formal Exploration Through Integration Between Algorithmic and BIM Environments

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This paper describes the experience of introducing students to design processes that use algorithm design and BIM tools. An exercise was presented to instigate the students to explore the interface between two known processes: the creation of algorithms in Grasshopper and the manipulation of objects in a BIM environment using Archicad. The exercise aimed at bridging the gap between algorithmic form creation and manipulation and representation and documentation techniques required in the design studios in order to encourage the students to explore new design processes using the appropriate tools at each stage.

Keywords: Parametric design; BIM; Grasshopper; Archicad; Workshop.

SESSION 3

Morphogenesis, synthesis and analysis of forms

Constructive-geometry: the integration of generation and construction systems in a case-study

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This project reflects about the use of the term constructive geometry, based on the development of a case study. Even if we posses the digital tools and processes to develop a design, it is not so clear how to combine the generation and the necessary tools to materialize it. To find form we rely on algorithmic generation unfolding this term with digital fabrication, to include material and techniques feedback. Constructive geometry looks for an inclusive computational design to integrate generation and fabrication. This process is tested and documented in the development of a studentl graduation project.

Keywords: Constructive geometry, digital integration, form generation, digital fabrication

Morphogenesis, synthesis and analysis of forms

Parametric design of shells in reinforced concrete: a case study of the Los Manantiales

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In this article it is proposed a study of reinforced concrete shells modeling, taking as case study the shell roof building designed by Candela in Xochimilco, Los Manantiales. The approach for this study is related to the comprehension of both project methodologies: the one before the use of the new emerging technologies and the one after. The objective of this study is to measure the structural efficiency of shells designed by both approaches and, simultaneously, how the emergence of new computational technologies and software's could influence in the design process in the civil engineering and architecture's design.

Keywords: Parametric design; Form finding; Shells; Reinforced concrete.

Morphogenesis, synthesis and analysis of forms

Mathematizing Niemeyer's architecture through parametric modeling: evaluating the parables of the Pampulha Church

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This paper describes the mathematization process behind the parables of the Pampulha Church, one of the most iconic buildings designed by Oscar Niemeyer, in order to check how applicable was the use of analytic geometry in his architecture. To reach this, we factored the second degree equations presented on the building based on the parable height and width, then using parametric modeling to translate the formula into shape. As a result, the study intended to demonstrate how equations can be integrated into architecture, identifying how conic curves are being applied to the architectural geometry.

Keywords: Parametric modeling; Pampulha church; Oscar Niemeyer; Analytic geometry.

Morphogenesis, synthesis and analysis of forms

Brazilian Design: Parametric modeling as memory of vernacular artifacts

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With the consolidation of digital media, we have seen the expansion of documentation and design modes. Two-dimensional representation was the main mean of communication in projects, however, in a process whose design of the form presents complexity, are no longer considered as adequate solutions. The parametric documentation of the vernacular knowledge of Icapuí boat production carries with it part of the immateriality of the step-by-step of a traditional process, resulting in the description of the complexity of the boat shapes. This article tries to affirm the power of the digital processes for the maintenance of the memory.

Keywords: Typology; Parametric Design, Heritage, Vernacular Design, Boats.

Morphogenesis, synthesis and analysis of forms

Generative design in the design development of metallic constructions

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The present article describes the construction of a system that combines parametric modeling strategies and genetic algorithms for optimization. By means of the reformulation of the Darwinian evolutionary process, it is sought to systematize a project process that allows the architect to act in the parameterization of the problems, beyond the mere formal proposition of solutions, in favor of the exploration of a greater variety of projective possibilities than would be possible using traditional design methods.

Keywords: Generative design; Evolutionary algorithms; Structural analysis; Environmental analysis and Metallic construction.

SESSION 4

CETEPE ROOM 01 (EESC.USP)
07/11/18 14h00
SESSION COORDINATOR **FREDERICO BRAIDA**

Information, models and simulations

Urban modeling for 3D GIS purposes from laser scanning: an implementation for university campus

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3D Geographic Information Systems (3D GIS) are systems capable of performing spatial analyzes that consider a three-dimensional representation of objects, through their planialtimetric coordinates. City Geography Markup Language (CityGML) is used for city and urban applications. The main challenges for this system implementation refer to the techniques used to obtain data, and their formats, in addition to the various software used in geometric modeling. In this way, this article aims to discuss geometric modeling for a university campus using airborne laser scanning data, aiming at the creation of database for applications development.

Keywords: 3D GIS; SIG 3D; CityGML; Geometric modeling.

SESSION 4

Theories and design practices in digital contexts

Exploring Urban Interventions through Computational tools: genetic algorithm and urban connection patterns

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This paper presents a particular approach to design processes in urban design, in a transdisciplinary environment. Exploring geotechnologies, information and communication technologies, artificial intelligence techniques and experimental softwares (fuzzy logic and generic algorithm), the workshop "Generation of Urban Connection Patterns", developed by IAU-USP (Brazil) and ETSA-US (Spain), aimed: to investigate urban space connection patterns in areas of environmental and social vulnerability; to explore formal arrangements in urban design; to foster academic exchange and possibilities of collaborative workshops. The article also discusses the role of computational tools and the implementation of in-person and non-presential methods in the teaching/learning process.

Keywords: Transdisciplinarity; Teaching and Learning; Genetic Algorithm; Urban Connection Patterns; Urban Design.

Interfaces and devices

The Virtual Reality as a tool to analyze modifications in the architecture of the city. Case study: the historical center of the city of Belém-Pará

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This paper presents the partial results of a research that experiments the use of Virtual Reality (VR) in the analysis of future interventions in the architecture of the city of Belém. The objective was the virtual reconstruction of part of the port area of the city, as it was about 100 years. The methods include a historical survey of the site, visits to obtain photographs and measurements, as well as the digital reconstruction of buildings (external faces only). The experiment used Sketchup software for modeling, Unity 3D for rendering and navigation, and HTC Vive glasses for immersion.

Keywords: Virtual reality; Architecture; History; Engine games.

Morphogenesis, synthesis and analysis of forms

Digital approaches for evaluating urban indicators: an application of CityMetrics for analysis of two neighborhoods in Juiz de Fora, Brazil

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This paper describes the application of CityMetrics, a system that articulates computational resources to analyze and optimize the performance of urban configurations. In this context, some indicators (and algorithms) such as Physical and Topological proximity, Spacematrix and Mixed-Use Index were used for analysis, optimization and comparison of two neighborhoods in the city of Juiz de Fora, Brazil. The objective of this research is to verify the possibilities of using computational tools to analyze and propose modifications in neighborhoods and cities, contributing to the decision making in the urban context.

Keywords: Urban indicators; CityMetrics; Mixed-Use Index; Spacematrix; Transit Oriented Development.

Teaching, research and extension in digital contexts

A graphic code, one hundred architectural projects

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This paper presents the results of the development of a graphic coding implementation system that was created to produce a series of diagrams integrated into a pre-existing digital guide platform (www.plexo.edu.uy). The aim of this coding system is - among others - to present a selection of one hundred architectural projects from different parts of the world, so that it serves as a guide in an academic trip made by architecture students. The drawings were made by advanced students who were taking an undergraduate course.

Keywords: Research-teaching; Architecture; Graphic Coding

SESSION 4

Teaching, research and extension in digital contexts

Emerging ecosystems of information and city: Anglo digital repository

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This paper focuses on the implementation of a digital repository and content management of the Museo de la Revolución Industrial, in Fray Bentos, as part of a project carried out in the context of the I+D project "La ciudad inteligente; un palimpsesto digital", currently under development in the Laboratory of Advanced Digital Visualization (Vidialab) of the Faculty of Architecture, Design and Urbanism (FADU). The project main theme is the emerging paradigm of Smart Cities with focus on the territory as an integral cultural landscape. The experience, implementation, processed involved and related topics, are described and analyzed theoretically, in the search of architectural and historical heritage dissemination.

Keywords: Heritage; Smart City; TIC; Digital repository; Dissemination of heritage; Free software.

SESSION 5

JORGE CARON ROOM (EESC.USP)
07/11/18 16h30
SESSION COORDINATOR **MATEUS VAN STRALEN**

Information, models and simulations

Towards Urban Densification: Parametric Modeling of Possible Scenarios for Urban Mobility

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This article presents a literature review on the relationship between urban design and travel demand, and systematically maps existing studies in generative, parametric and procedural urban modeling that have approached the subject. The methods used in these papers are discussed, and the computational tools described in them are analyzed to identify how they can be used to support the design process for retrofitting urban streets. The findings are used to identify what further developments are needed in order to allow for visualizing the impact of design decisions on modal share.

Keywords: Urban design; Parametric urbanism; Travel behavior; Built environment.

Morphogenesis, synthesis and analysis of forms

Computationally Analyzing Biometric Data and Virtual Response Testing in Evaluating Learning Performance of Educational Setting Through

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Due to construction costs, the human effects of innovations in architectural design can be expensive to test. Post-occupancy studies provide valuable data about what did and did not work in the past, but they cannot provide direct feedback for new ideas that have not yet been attempted. This presents designers with something of a dilemma. How can we harness the best potential of new technology and design innovation, while avoiding costly and potentially harmful mistakes? The current research use virtual immersion and biometric data to provide a new form of extremely rigorous human-response testing prior to construction. The researchers' hypothesis was that virtual test runs can help designers to identify potential problems and successes in their work prior to its being physically constructed. The pilot study aims to develop a digital pre-occupancy toolset to understand the impact of different interior design variables of learning environment (independent variables) on learning performance (dependent variable). This project provides a practical toolset to test the potential human impacts of architectural design innovations. The research responds to a growing call in the field for evidence-based design and for an inexpensive means of evaluating the potential human effects of new designs. Our research will address this challenge by developing a prototype mobile brain-body imaging interface that can be used in conjunction with virtual immersion.

Keywords: Signal Processing; Brain; EEG; Virtual Reality; Big Data; Learning Performance

Theories and design practices in digital contexts

Fuzzy set theory for parametric design: A case study of non-standard architectural practice in China

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This paper introduces the fuzzy set theory to parametric architectural design and presents it as a strategy which architects can adopt to control a project's complexity during the stage of design development. We discuss how the fuzzy set theory's 'vagueness' allows architects to delay their decision makings, especially when they are facing implementing situations where it is difficult to provide additional information needed for complex construction. In this study, we first introduce a metric for project complexity proposed by William Mitchell, who uses the notion of design content and construction content. Followed this we will explain the fuzzy set theory and its rationale for parametric designs.

Keywords: Fuzzy set theory; Parametric design; Non-standard façade; Local affordances; China.

Teaching, research and extension in digital contexts

Bio-inspired parametric textures applications in academic design projects

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Designers, architects and different creative professionals have used biomimicry, as a recurrent tool to solve human problems through the identification of strategies, characteristics and solutions in nature. This article presents the first highlighted experiences of bio-inspired parametric textures applications in academia, particularly in final degree projects, which are carried out through the methodology proposed in the bio-inspired parametric textures research project. This paper is divided into two parts: the first part is focused on bio-inspired textures applications methodology; the second part is oriented to show two cases of final degree projects in the industrial design career.

Keywords: Biomimetics; Experimental morphology; Digital manufacturing; Parametric design; Design

Interfaces and devices

Responsive Architecture in Open Spaces – Interaction between man, object, place and landscape

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This paper has the purpose to present the results of a research whose intention was to develop interactive elements for the illumination of free spaces seeking an extension of the user's perception in relation to its surroundings, aiming at a direct man-object interaction. The processes of construction of the models and prototypes developed using information and communication technologies (ICTs) are presented, as well as a discussion about how it is possible to integrate the physical and digital environment in order to allow the user to understand the dynamics of space use in different areas of the city, regardless of where you are.

Keywords: Responsiveness; Illumination; Prototype.

SESSION 5

Teaching, research and extension in digital contexts

Use of Hygroscopic Responsive Wood Prototype for Teaching Performative Architecture

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This research presents a method for teaching performative architecture notions to undergraduate students through a practical approach with low cost hygroscopic responsive bilayer prototypes made of wood veneer and aluminum foil. The research occurred in two phases, the first focusing on studying and testing the properties of responsive materials based on wood, and the second, the development and application of two workshops about performative architecture and responsive materials with undergraduate students of an architecture course. This paper shows the results of the workshops, which achieved their goals of stimulating the students and passing knowledge about innovative technologies in architecture.

Keywords: Performative architecture; Smart material; Teaching; Wood hygroexpansion.

SESSION **6**

LUIZ GASTÃO DE CASTRO LIMA ROOM (EESC.USP)
07/11/18 16h30
SESSION COORDINATOR **RUY SARDINHA LOPES**

Digital technologies and society

Horizontal dialogues and open data: the communication spaces of bottom-up urbanism

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The process of overcoming the digital divide has led to the formation of common interest groups. Network communication has become not only a mean, but also a conditioning for the horizontal structure of groups that are also dedicated to transforming urban spaces. Known as processes of bottom-up urbanism, these groups add virtual layers to urban space, and acting in a cybrid way they make inseparable the actions that occur on the virtual or material environment. This research is dedicated to understanding the dynamics of communication in a Facebook group created in one of these bottom-up urbanism processes.

Keywords: Bottom-up urbanism; Network society; Facebook; Communication process.

Creative industries and artistic practices

Anamorphic Art as an Urban Intervention Strategy

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The study is based on the current context of digital creation methodologies and aims to discuss the use of the Anamorphic technique as Urban Art and its role in the creation of new meanings. That objective is to study the technique of Anamorphosis as an instrument that enhances public space, allowing the creation of a work of artistic value as a means of appropriating free spaces. By means of four actions carried out within a research group of a Brazilian public university, the relations between anamorphic object and observers were analyzed from Peircean Semiotics.

Keywords: Anamorphosis technique; Urban art; Peirce; Cyberculture; Cyber semiotics.

Manufacture and digital construction

Urban Kindness: Parametrization and digital fabrication powering forgotten spaces

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The goal of this paper is to present and discuss the design process of a intervention realized in a historic building placed in Campo Grande/MS, Brazil. The project had as premise the invitation to use, coexistence or contemplation in the previously degraded and unused space. The project was carried out through the partnership between the algo+ritmo research group from UFMS and the Casa de Ensaio, a non-profit organization. The main goal was that students of architecture and urbanism could use digital technologies to design, developt and executate the project, and also control the whole process from the beginning to the end.. Through the evaluation of the results, this paper reflects on procedures used in undergraduate courses seeking to contribute to the dissemination of other forms of design processes different from conventional ones.

Keywords: Urban intervention; Urban kindness; Project process; Parametric Design, Digital Fabrication.

Teaching, research and extension in digital contexts

Hybrid technopolitics for a collective construction

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This paper refers to the creation of a collective construction as the opening class of three correlative courses. Before the event, the installation was designed and planned by the teaching staff, combining digital and analogical instruments, which allowed us to carry out a project that involved over five hundred participants. On the site, students built the objects without digital tools, as they were unavailable. These hybrid resources made possible the production of an object that was meaningful for both, students and teachers, as an introductory action of the concepts that would be developed in the courses throughout the year.

Keywords: Hybrid; Installation; Collaborative; Education; Restrictions.

Digital technologies and society

Temporary shelter design from a digital-analog design process: Habitable emergent solution for operational resilience

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This work proposes an emerging habitable solution for families with children receiving attention in a public hospital, which do not include a shelter service for them. In this case of study, an informal settlement has grown for years in the surroundings of the hospital. The phenomenon is identified and analyzed, the variables activating the resilience systems and the self-organization capacities of those affected, to generate alternative solutions within an evolved vision that improve the emotional and habitability conditions of the families living in the settlement. The methodological process is composed of five stages: Diagnosis, analysis-synthesis, design determinants and design alternatives.

Keywords: Shelter; Emergence; Resilient; Design, Fab-Lab.

Digital technologies and society

Architects and refugee camps: a case study for bottom-up approaches

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The United Nations High Commissioner for Refugees (UNHCR) defines “refugees” as people forced to leave their country because of armed conflict, widespread violence and massive human rights violations. This paper presents and discusses a methodology for implementing a refugee camp in the context of the migration of southern Sudanese to Uganda. The proposal involves an intersection between 3D printing technology of LDM (Liquid Deposition Modeling) process, using soil as the main input, and participatory bottom-up processes in order to promote gradual technical and creative autonomy, sense of community and mental health of these people.

Keywords: Architecture; Refugee camps; Humanitarian design; Digital fabrication; Bottom-up approaches.

SESSION 7

PROF. SÉRGIO MASCARENHAS ROOM (IFSC.USP)
07/11/18 16h30
SESSION COORDINATOR **ANJA PRATSCHKE**

Information, models and simulations

Challenges of implementing Building Information Modeling (BIM) in the Construction Industry

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Building Information Modeling (BIM) has provided a new level of technology and efficiency to the construction industry, making production processes more integrated and proficient. This type of innovation is a complex implementation process with many gaps that must be addressed. This article highlights the challenges of implementing BIM, discussing strategies to transform this scenario. The methodology is developed from synthesizing the literature and analyzing semistructured interviews with architects. The results, obtained through content analysis, are explained by the subdivision of the implementation challenges in the following categories: human factor, management, policy, market, and technology.

Keywords: Building Information Modeling; BIM; Challenges; Implementation.

Theories and design practices in digital contexts

Identification of applicable patterns to algorithmization in BIM to explore solutions in the design stage of Social Housing

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In architecture, the algorithm application for innovative solutions exploration has become particularly important as the basis for distinct methodological approaches, becoming a significant technological artifact both for form exploration, as for the urban insertion and implantation. In this sense, the primary objective of this work is the identification, the description and the formulation of the algorithm that permeate patterns from Alexander (1977), for the context of social interest housing complexes project. It is wished to foment the possibility of incorporating the human-environmental relationship knowledge to the Building Information Modeling, through generative systems for the enhancement of creative practices.

Keywords: Algorithm; Patterns; Building Information Modelling; Computational design; Social housing.

Morphogenesis, synthesis and analysis of forms

Generative housing: a shape grammar to design and to build social houses

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This paper shows the development of a system to generate customized small housing projects. The process of housing construction usually involves investment for the development of the project and for the management of the building process. In small housing, this investment is left aside for economic reasons. However, due to lack of it, the project may not be adequate and its construction can be even more costly. Aiming to contribute to this issue, this paper presents the creation of a generative design system, a shape grammar, that seeks to reinterpret the traditional design/construction process of housing.

Keywords: Generative design; shape grammar; housing; visual proggraming.

Information, models and simulations

Designers of the XXI century: BIM software programming and the development of new competencies

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This paper presents the scenario of programming use by architects and engineers by creation of their own unique tools. It aims to emulate and understand BIM software customization phenomenon by development of plug-ins. Design Science Research was used to direct the construction of artifacts for specific practical problems. Results are presented by development of Revit plug-ins to meet Brazilian Performance Standard criteria in areas of acoustic and luminous performance. It is concluded that scripting enables the designer to tailor processes to their own particularities, possibly becoming a high-impact skill in the future, with importance regarding their independence and versatility.

Keywords: BIM; Programming; Design science research; Dynamo; Performance Standard.

Information, models and simulations

Digital scanning and BIM modeling for modern architecture preservation: the Oscar Niemeyer's Church of Saint Francis of Assisi

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The Building Information Modelling (BIM) technology enabled improvement in the design, construction and maintenance stages highly. In the field of existing buildings, including historical assets, this technology has not yet had the same impact. This paper presents a methodology to create an intelligent digital model for an outstanding building from modern architecture in Brazil using multiple reality-based technologies. The fusion of the different point cloud raw data generated a high-resolution Dense Surface Model (DSM), the base of an accurate and detailed parametric Model. This study demonstrated the potential of digital surveying, including low-cost sensors, and BIM for built heritage documentation.

Keywords: Reality-based surveying; Point cloud; As-is model; Building Information Modelling; Modern Heritage.

SESSION 7

Information, models and simulations

Collaborative or adversarial production and BIM: a method for better understanding of contracting types, based on BPMN

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BIM represents a paradigm change in the production process, and its use can be facilitated or hindered by the contracting scheme. Contracting can be relational or transactional; the first refers to collaboration and the second to an adversarial environment. In literature, the different contracting schemes are presented in textual form, which is not the best format to analyze similarities and differences among them. A graphical form for comparison is proposed, using the well-known diagrams of AIA and the BPMN notation. A collaborative production process favors integration and the use of BIM, resulting in more efficiency and quality of the project.

Keywords: BIM; BPMN; Construction contract; Integration; Production process.

SESSION **8**

JORGE CARON ROOM (EESC.USP)
08/11/18 8h30
SESSION COORDINATOR **GABRIELA CELANI**

Manufacture and digital construction

Robotic Connections: Customisable Joints for Timber Construction

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Timber is one of the most sustainable, renewable products, and coupled with computational tools has the potential to be redefined as a digital-age material. The research outlined in this paper employs contemporary digital fabrication techniques utilising a robotic arm to develop complex, CNC based parametric connections for engineered timber. While CNC joinery that utilizes three - five axis machining capabilities is increasingly common, the introduction of the six-axis robot as a machining tool provides greater freedom of movement and a wider range of complex procedures. This research returns to traditional Japanese timber craft, which offers unique structural and sustainable advantages. Using computational tools, new complex parametric connections suitable for contemporary fabrication will be designed and contribute to a library of joints suitable mass-customised in non-standard timber architecture.

Keywords: Robotics; Fabrication; Parametric; Timber; Architecture.

Manufacture and digital construction

The fabrication and application of parametric inflatable structure

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This study uses parametric design to optimize the process and application of the inflatable method. Inflatable design has advantages of light weight, integral forming, volume change, etc., but the manufacturing process often requires the development of molds, a large number of manual heat seals, etc. Inspired by the structure principle of amputated wing tube structure, coupled with the advantages of parameterization and digital tool heat sealing, The same material can be made at different tightness, because the tight design with different angles has more structural characteristics and bending properties, thereby generating more complex spatial structures. Different materials also have corresponding manufacturing methods, which also increase the opportunities for application in architectural design.

Keywords: Robotic arms fabrication; Inflatable Shape-change; pneumatic; bending mechanism; pavilion design.

Manufacture and digital construction

Digitally Fabricating Expandable Steel Structures Using Kirigami Patterns

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This article presents a computational approach to generating architectural forms for large spanning structures based on a "paper-cutting" technique. In this traditional artform, a flat sheet is cut and scored in such a way that a small application of force prompts it to expand into a three-dimensional structure. To make these types of expandable structures feasible at an architectural scale, four challenges had to be met during the research. The first was to map the kinetic properties of a paper-cut model, investigating formative parameters such as the width and frequency of cuts to determine how they affect the resulting structure. The second challenge was to computationally simulate the paper-cut structure in an accurate fashion. We accomplished this task using finite element analysis in the Ansys software platform. The third challenge was to create a prediction model that could precisely forecast the characteristics of a paper-cutting pattern. We made significant strides in this demanding task by using a data-mining approach and regression analysis through 400 simulations of various cutting patterns. The final challenge was to verify the efficiency and accuracy of our prediction model, which we accomplished through a series of physical prototypes.

Keywords: Transformable Paper-cut; Design method; Prediction Model; Regression analysis; Physical prototype.

Manufacture and digital construction

Fused Deposition Modelling Formworks for Complex Concrete Constructions

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Concrete is undoubtedly the most employed material in constructions. In principle it allows to build complex architecture, where form can be for the realization of complex shapes. However, the biggest limitation of its use is explained by the demanding process needed to create free-form casts, it often limits its potential to obvious geometries. With the aim of overcoming current limitations, this paper explores the use of additive manufacturing to create formworks for concrete elements. The case study of a complex column is here utilized in order to develop an approach for advanced molds, where pressure levels, fluid dynamics of concrete and disassembly are integrative part of the design process. In conclusion are presented recommendations for further development at larger scale.

Keywords: Digital concrete, Casting, Additive Manufacturing, Digital Fabrication, Construction Method.

Manufacture and digital construction

Kerf bending: ruled double curved surfaces manufacturing

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Knowledge of geometric properties of surfaces is crucial for resolution of many manufacturing problems. Developability is an important feature of a surface that allows its manufacture from a flat "strip" of a "flexible" and "non-deformable" material. Digital fabrication technologies and parametric design tools, based on knowledge of geometry, are changing designer way to think. Our research in the field of non-developable surfaces fabrication move from paneling to "kerfing". This technique allows to transform a rigid material in a flexible one. The main problem to solve is how to cut the flat shape to obtain the design surface.

Keywords: Non-developable surfaces; Developable surfaces; Shape grammar; Parametric design; Kerfing.

Morphogenesis, synthesis and analysis of forms

Plant-inspired Kinetic Systems for Architecture

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This paper explores kinetic mechanisms which enable building systems with features belonging to the living systems, such as resilience and adaptivity. Adopting a bio-inspired approach, the research employs plants as biological models for the development of multi-performance kinetic structures. Nature-based kinetic principles are transferred at the micro, meso and macro scale, informing a compliant bilayer cellular membrane. Through the synthesis of environmental pressure and interior emergent requisites, an adaptable organic skin is here conceptualized to mediate environmental conditions such as energy flows and lighting in a dynamic way.

Keywords: Bio-inspired Design; Computational Design; Kinetic System

Information, models and simulations

Geometry from 3D Photogrammetry for Building Energy Modeling

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Building energy modeling requires skilled labor, and there is a need to make environmental assessments of buildings more efficient and accessible for architects. A building energy model is based on collecting data from the real, physical world and representing them as a digital model. Recent digital photogrammetry tools can reconstruct real-world geometry by transforming photographs into 3D models automatically. However, there is a lack of accessible workflows that utilize this technology for building energy modeling and simulations. This paper presents a novel methodology to generate a building energy model from a photogrammetry-based 3D model using available tools and computer algorithms.

Keywords: 3D scanning; Building energy modeling; Building energy simulation; Digital photogrammetry; Photo-to-BEM

SESSION 9

LUIZ GASTÃO DE CASTRO LIMA ROOM (EESC.USP)
08/11/18 8h30
SESSION COORDINATOR **PAULO CASTRAL**

Digital technologies and society

Techno-political strategies and tools to increase interdisciplinary collaboration and community participation around public health policy and the built environment

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In order to impact individual behaviors that contribute to risk factors for chronic disease, a multi-disciplinary and inter-institutional working group was established to foster creative ways to increase community participation in public policymaking using the socio-ecological model as a point of reference and community-based participatory research methods to define priority issues and strategies, including techno-political tools such as the creation of a public information repository, community mapping, educational and awareness campaigns, and the use of social media to engage with policymakers.

Keywords: Built environment; Health promotion; Chronic disease prevention; Community participation.

SESSION 9

Digital technologies and society

Digital Governance and Cybernetics

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The paper studies the application of cybernetics theories in urban planning and digital governance's development. Three case studies were analyzed by cybernetics philosophers Norbet Wiener and Stafford Beer, exceptionally the relationship between 1970s Chilean experiment by Beer, CYBERSYN, and current digital governance municipalities. The methodology includes historical contextualization and followed the start, progress and the conclusion of completed cases. The results have shown the influence of private management tools applied in citizen participation.

Keywords: Cybersyn; Cybernetics; Digital Governance.

Information, models and simulations

Simplifica Extension Project: Salvador georeferenced database

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The project is one of the actions of the SIMPLIFICA Axis of the Salvador 360 Project. This axis aims to "reduce bureaucracy of citizens and entrepreneurs through the restructuring of the current model of licensing, opening of companies and rapid consultation of information by the population of Salvador, Bahia State". Such definition directly dialogues with the theme of the Congress, since Technopolitics concept is understood as practices of conception, revision and use of technological artifacts that operate as common goods". Thus, this project aims to create the database for the SIMPLIFICA axis of the Salvador 360 Project of the Municipality of Salvador and reduce the bureaucracy in the municipal sphere.

Keywords: Georreferenciamento; Planejamento Urbano; Tecnopolítica; Cidades Inteligentes

Digital technologies and society

Digital platforms for urban mobility

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This work aims to analyze the use of digital platforms in urban mobility. It describes examples of applications and platforms grouped by their function, as the way they assist physical displacements in the urban environment. 25 platforms were catalogued in four main categories: mobility orientation, on-demand transport, vehicle sharing and ride-sharing. The use of digital technologies reveals some potentialities and limitations of arrangements, uses and appropriations that deserve to be analyzed in order to understand the possibilities of action facing the challenges posed for urban mobility.

Keywords: Urban mobility; Digital platforms; Locative media; Technopolitics.

Information, models and simulations

Internet of Things Technology and Policy in Belo Horizonte Public Transportation System

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From a critical point of view regarding Smart Cities, this paper presents an overview of Brazilian policies concerning the application of Internet of Things (IoT) on public transportation systems, using as a case study the city of Belo Horizonte. We performed a critical analysis of its public transportation system considering the already installed IoT infrastructure, including mobile communication technology that uses distributed locative media among users. Our main focus was understanding its use, potential and political dimension, specially concerning terms of use and data distribution and sharing between users, public administration and private companies that compose the transportation system.

Keywords: urban transportation system; technopolitics; internet of things; smart city; instant city.

Digital technologies and society

Participatory processes in the contemporary city: what is the role of Information and Communication Technologies?

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Urban planning is composed of actions that bring together actors and diverse interests and, therefore, many obstacles. Participation is a fundamental factor for the success of these processes in search of fairer cities as it promotes the exacerbation of conflicts. This research investigates the role of Technologies and Information and Communication (TICs) in participatory processes. For this, virtual participation devices were raised and a connection was made from the established connections between governors and governed. Thus, the objective is to study the potential of ICT use in the construction of more coherent participatory processes.

Keywords: Participation; City; Information and Communication Technologies.

SESSION 10

PROF. SÉRGIO MASCARENHAS ROOM (IFSC.USP)
08/11/18 8h30
SESSION COORDINATOR **JOUBERT LANCHA**

Teaching, research and extension in digital contexts

Language design for modelling: a cognitive approach

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Programming languages have traditionally being designed or chosen to be used in modelling systems with little care to what should be its central concern: the model, and its relation to the programmer's body, to her self,to her being in the world, causing frustration to the student trying to learn the basics of programmatically modelling. This work presents an alternative approach for the design of a language for modelling, aimed to mitigate some of the cognitive barriers normally found in traditional systems.

Keywords: Computational design; programming languages; cognition.

SESSION 10

Teaching, research and extension in digital contexts

Animation and Prototyping as Tools for Teaching Project in Architecture

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The research explored the use of animation and prototyping as a tool to aid in the materialization and development of project ideas, not just as a means of presenting the final project. The article brings the elaboration, application and results obtained from a seven-day workshop with a group of students of the third year of graduation of the course of Architecture and Urbanism.

Keywords: Architectural Design Process; Animation; Prototyping; Teaching.

Teaching, research and extension in digital contexts

Digital and physical models in graphic representation teaching: a didactic experience

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Drawing is a language that involves processes of coding and decoding images and must be dominated by professionals who act on the space. In order to contribute to the discussions about graphic representation teaching, this study aims to analyze students' perceptions about two didactic experiences of orthographic views representation: through interaction with physical model and digital model. It seeks to understand which experience is evaluated by the students as the most significant. Another issue of interest to the authors is to understand how much their interaction with the digital object can be considered 'concrete', since they are digital natives.

Keywords: desenho; visualização espacial; percepção; modelo físico x modelo digital.

Teaching, research and extension in digital contexts

Learning Math and Digital Prototyping with Mobile Digital Fabrication Lab

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It is well known that Math learning processes common used within elementary school phases are not necessarily competent. Students are rarely capable of relating acquired knowledge with day by day activities and memorizing practices are encouraged by teachers. On the other hand, the use of games during learning development is an important alternative that brings interest, playful and real knowledge of content assimilation. This paper describes how digital fabrication tools were used by students to develop and build game prototypes as an option on Math learning. The experience was accomplished through a Mobile Digital Fabrication Lab as an instrument that brought these technologies to students.

Keywords: Digital Prototyping; Educational Games; Mathematics Teaching; Laser Cutting; FabLab

Creative industries and artistic practices

Type in motion: The representation of the illocutionary force through the expression of the kinetic typographic form

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The objective is to analyze how type in motion contributes to the representation and transmission of the illocutionary force of a statement in the field of communication and digital animation. This is a context characterized by being a hybrid of image and sound, of a esthetic and technological diversity and mixtures of representation techniques and animation of different types of motion graphics. The expressive form of the signs of writing is crossed by the variables time, movement and sound and from here their ability to transmit the illocutionary force is enhanced.

Keywords: Typography in movement; Illocutionary force; Kinetic writing; Digital animation; Typographic form.

Teaching, research and extension in digital contexts

TICs in the Geometry Education: Proposals for Change the Content Approach

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The use of technology instigates student interest. Thus, the possibilities offered by the technologies should be presented to students during their professional training. This paper aims to propose to teachers a change in the approach of 'geometry' contents through the use of BIM, Augmented Reality, Virtual Reality, Rapid Prototyping and Digital Fabrication. The methodology chosen was Systematic Review of Literature and literature review without meta-analysis. It presents an overview of the applicability of such technologies in teaching, as well as possibilities little explored. The results indicate that 'geometry' teaching can benefit from the great potential offered by Information and Communication Technologies.

Keywords: Teaching of 'geometry'; BIM; Augmented Reality; Virtual reality; Rapid Prototyping.

Morphogenesis, synthesis and analysis of forms

The use of parametric modeling and rapid prototyping in teaching graphic expression

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The introduction of new technologies in design areas is due, in large part, to the rapid development of the computer industry. This new paradigm has created tools and creative possibilities in the routine of several professionals. The Graphic Expression Department is responsible for disciplines that include the knowledge of Graphical Geometry and different approaches to graphically represent projects from different areas of knowledge. Thus, the present experiment presents a possibility of updating the teaching of representation from the introduction of Shape Grammar and through digital tools, in particular, the use of parametric design, visual programming and rapid prototyping.

Keywords: shape grammar; parametric design; graphic geometry; visual programming.

SESSION 11

CETEPE ROOM 01 (EESC.USP)
08/11/18 8h30
SESSION COORDINATOR **MÁRCIO FABRICIO**

Morphogenesis, synthesis and analysis of forms

User-centered shape grammars for housing transformations: towards post-handover grammars

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This paper presents a post-handover shape grammar for introducing inhabitants wishes in the transformation of individual houses of the Malagueira housing complex by Álvaro Siza Vieira in Évora, Portugal. The presented research includes a case study developed in the context of the workshop Gramática da Forma em estudos de habitação - análise, geração e customização at the Universidade Federal do Rio de Janeiro, Brazil. In this paper we present the first developments of the Malagueira transformation grammar, including corpus of analysis, shape rules, and derivations, and we discuss the opportunities that shape grammar brings to user-centered design.

Keywords: Housing; Participatory design; Shape grammar; Transformation; Inhabitants.

SESSION 11

Theories and design practices in digital contexts

Furniture kits and physical model as a tool for visualization of the minimum residential spaces according to the anthropometric ergonomics

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This paper presents the results obtained through the development of furniture kits and physical model, aiming to compare the minimum design requirements described in the anthropometric ergonomics, current housing program and construction law. The qualitative approach through bibliographical and documentary revision allowed the choice of technical representation, using BIM software for design and subsequent digital prototyping. It concludes that the creation of environments according to the minimum requirements does not allow the use of space according to its purpose, and by making use of furniture kits, it is possible to obtain experiments and better understanding.

Keywords: Physical model; Housing of social interest; Rapid prototyping; Minimal spaces; Anthropometric ergonomics.

Theories and design practices in digital contexts

From the automated generation of layouts to fabrication with the use of BIM: a new agenda for Architecture in the 21st century

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Scripting, BIM and Digital Fabrication are already recognized as important skills in education and practice in Architecture in the 21st century. However, they are not always applied together to generate innovative results for the industry. This paper starts from the observation of the difficulty that prefabricated bathroom factories have in meeting a demand for mass customization and proposes a workflow that goes from the generation of layouts to modeling in BIM and the automated production of documents for manufacturing. The preliminary results demonstrate the possibility of changing the mass production culture of an industry, by means of applying the proposed workflow.

Keywords: Building Information Modeling; Process algorithm; Automation; Modular bathrooms; Prefabrication.

Manufacture and digital construction

Proposal of a Process of Mass Customization of Kitchen Cabinetry

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Digital Fabrication has been widely used for the production of standardized building components, but not so in the engineered-to-order fabrication strategy, a system in which the customer's needs are fulfilled in the design stage. Mass Customization meets the demands of a customer at a cost near that of Mass Production. This study presents the current stage of an Action Research dealing with Mass Customization, design and BIM adoption challenges, proposing the adoption of BIM aiming Mass Customization at engineered-to-order systems for Small and Medium Enterprises. It uses Web-based User Interface and Revit and Dynamo models exported to Computer Numerical Control machines.

Keywords: Mass customization; Engineered-to-order; Digital fabrication; Prefabrication; BIM.

Interfaces and devices

Immersive virtual reality device to support the housing design process

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This paper discusses the process of communication between designers and users during the initial stages of defining the housing design. The objective is to demonstrate the application of a three-dimensional device with virtual reality technology as a tool to facilitate communication between stakeholders in a participatory design context. The method consists of a simulation dynamics, and the application of cognitive walkthrough, verbal protocol and participant observation. The results showed that the simulation model can facilitate the user's understanding of the project represented, as well as stimulate productive discussions about their preferences, needs and wishes about the designed space.

Keywords: Simulation; Virtual reality; Participatory design; User.

Theories and design practices in digital contexts

Mass Customization: a critical perspective on parametric design, digital fabrication and design democratization

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The ability of parametric design to generate variations and bespoke products, combined with the capability of digital fabrication to render this variety physical enables the mass-production of non-standard products. Several companies are adopting parametric driven digital interfaces that enable the user to change design parameters to personalize a product. This "democratization" of design - as it is being called - has multiple social, cultural, and design implications. This paper addresses the idea "design democratization" with a critical viewpoint and advocates for a different perspective of design democratization based on conversation cycles and the copying, transforming, and sharing of code.

Keywords: Mass Customization, personalization, design democratization

SESSION 12

JORGE CARON ROOM (EESC.USP)
08/11/18 14h00
SESSION COORDINATOR **DAVID M. SPERLING**

Digital technologies and society

Aesthetics of Resolution. A postdisciplinary approach to countering the technocapitalist black box

Gerald Nestler
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Visibility and knowledge are based on access to information. We usually consider this as either a question of collecting new or examining existing data. However, the term "black box society" (Pasquale) points to a situation in which data are deliberately concealed, enabling complex processes of technocapitalist exploitation. Manufacturing information asymmetry and noise have become effective tools to gain competitive advantage across all levels of life. This text argues that adverse technopolitical schemes can be addressed with an aesthetics of resolution and with the figure of the renegade, an expert who makes the black box speak from inside.

Keywords: Aesthetics; Black box automation; Big data; Finance; Information asymmetry; Resolution; Renegade

SESSION 12

Creative industries and artistic practices

The Invisible Around: Art And Informational Space [The Unstable Place]

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The paper discusses variants of informational spaces, permeated by connectivity and communication flow. The approach considers the 'place' as a field of semantic migrations, it seeks to investigate an architectural space that tends to include invisible aspects in its constitution, affected by a set of recent communication technologies. It comments on creative processes and artistic experiments investigating ways to "see" or visualize electromagnetic fields, radio waves, wi-fi and cellular signals generated by media in circulation spaces, in convergences of crossing signs and systems.

Keywords: Informational space; Electromagnetic fields; Obsolescence; Mobility; Context specificity.

Interfaces and devices

Hidra System(!) in the tension between Internet of Things and Virtual Reality: programming meta-objects

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We will characterize the relationship between Internet of Things (IOT) and Virtual Reality (VR) as the tension between analog and digital domains, organized by several interfaces specifically developed for this study, during de course Interactive Architecture at the Architecture School - UFMG. These interfaces, referred here as programmable meta-objects (MOPs), recombine themselves to form an environment where inputs and outputs of each MOP are made available to other networked MOPs through the Hydra System (!). These MOPs can have both a physical existence (object present in physical space) and a "virtual" existence (it exists in the Virtual Reality environment).

Keywords: Hidra System(!); Virtual Reality; Internet of Things; Combinatorial; Meta-objects; Programmable.

Creative industries and artistic practices

Participation and contemporary spatialities: new technologies of social agency

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Focusing on the Museu do Futebol and Google Campus – São Paulo, specifically their impacts on the space conventions of culture and labor, this article aims to investigate main questions behind the contemporary phenomena that erases previous boundaries between both fields. Manuel Castells´ concept of "informational economy" will be confronted with Michel Foucault´s theoretical perspective of power devices, social agency and the fabrication of the neoliberal subject to demonstrate how key terms such as participation, collaboration and interactivity – associated with informational technologies – are producing new spatialities that are functioning as sophisticated forms of social behavior and experience control.

Keywords: Participation; Contemporary spatialities; Space and Power; Social agency.

Information, models and simulations

Emerging senses from Smart Cities phenomenon

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The paper analyses the emerging senses from the Smart Cities phenomenon, using as background Lemos (2017), Maia (2013), Rozestraten (2016), Söderström, Paache & Klauser (2014) and evaluating the speeches found in the SmartCity Expo Curitiba. We identified three basic senses: the binary utopia/ficcion, business and informational city, discussed by philosophers such as Foucault (2017), Lévy (2011) e Harvey (2014). The results outline the importance of political role of technology and adverts that it must not be controlled by business. Finally, the paper concludes that the smartest technology is one that opens space to the inclusion of greater human expressivity and subjectivity, not inducing a space of control.

Keywords: Smart cities; Digital technologies; Technopolitics;

Theories and design practices in digital contexts

Between the Cloud and the Concrete: The Data Center as a cybernetic Heterotopia

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The imminence of the Information Era brings with it profound changes in the society, and in Architecture field, new challenges are presented practically in all its dimensions. It has changed ways of think and practice, and new demands appears as new questions to the architects. In this paper, we analysis the Data Center as an Architectural problem, considering its existence in a functional and symbolic way, which represents, with its materiality, the visible face of the ethereal "Cloud" where all the modern society is supported.

Keywords: Heterotopia; Data Center; Cloud; Society; Internet.

SESSION 13

LUIZ GASTÃO DE CASTRO LIMA ROOM (EESC.USP)
08/11/18 14h00
SESSION COORDINATOR **PABLO HERRERA**

Creative industries and artistic practices

Artisans and Digital Craft in Latin America: The contribution of architects to their creativity and production

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This research explores the work of a generation of Latin-American architects who use programming and fabrication with traditional artisans. In the 21st century, this scenario was empowered from experiences produced in Fab Labs and Makerspaces in the context of localisms. We look at how digital technologies improve their processes, focusing on creation, adapting to the new economy, strengthening the regional identity in the scene of globalized Design, when political discourse drives innovation and technology to its benefit. The main objective is to understand the coexistence of designers and traditional artisans, providing experiences that could strengthen the identity of design in the region.

Keywords: Artisan, Digital Craft, Digital Fabrication, Latin America.

SESSION 13

Digital technologies and society

Technological appropriation and socio-technical adequacy in South America: applications of digital fabrication in architecture and design

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This paper presents part of an ongoing research about the state-of-the-art of digital fabrication in South America. From case studies, it shows the characteristics of technological appropriation in architectural and design processes and artifacts, under aspects of socio-technical adequacy, politics of fabrication and social innovation. The aim is to identify some specificities in technical, cultural and social activities, bound to local contexts and their political issues. The result is made up of six analysis categories that systematize the projects and allow a formal, functional, symbolic and political analysis, in addition to characteristics of local production.

Keywords: Digital fabrication; Contemporary architecture; Technological appropriation; Socio-technical adequacy; South America.

Manufacture and digital construction

Coastal Fog Tower – Design and Fabrication Process of a Vertical Fog Capture Device

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The coastal fog-harvesting tower project is a proposal that seeks to develop a water capture system from the condensation of coastal fog and rain, in a vertical structure that allows greater efficiency in collecting ambient humidity versus current bi-dimensional horizontal systems. The water availability in our country has declined over the last decade, so innovative solutions are required to take advantage of our unique coastal water potential. Using digital and analogue design technologies has been possible to develop a highly replicable and adaptable structural solution that can bring an affordable answer to this problem.

Keywords: Fog-Tower; water, 3d-print, digital-fabrication

Manufacture and digital construction

A Shelter in extreme environments: Prototyping of the riverine house in the Amazon

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This article aims to contribute to the debate in the production of lightweight architectural structures, focusing on the dwelling, as well as design processes in extreme areas, resulting in the understanding of their formation processes. The report of the process of prototyping and BIM modeling of a floating riverfront housing, Solimões floodplain area, the city of Manacapuru, Amazonas in Brazil. In the context of the shelter, vernacular, what would be the most appropriate design processes for the complexity of social and environmental parameters, traditional technological resources in counterpart to the processes of the Digital Age, as a hybrid process, proposing mediation between traditional and scientific knowledge.

Keywords: Environment; BIM; Prototyping; Housing; Amazon

Manufacture and digital construction

Digital-Analogic Algorithmic Laminar Artifact: Technopolitical convergences in Design

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This work refers to the design, development, fabrication and exhibition of the device called A.L.A.D.A. (Digital-Analogic Algorithmic Laminar Artifact), an experimental project that combines parametric-analog morphogenesis and digital fabrication in a process of architectural-spatial discovery based on cut-flexibility that results in a metaphorical operation, a kind of simultaneous Muybridge-style kinematic capture. The experience arises from the collaborative interaction between two research projects on morphology and digital media, their new morphogenerative and manufacturing possibilities, and the thought of digital manufacturing from productive and morphogenetic processes, in conjunction with an experimental and productive space outside the university. The working methodology from 2D to 3D through the flexibilization of rigid sheets through small-scale laser cutting was adapted to work in large proportions to allow viewers to walk around the artifact.

Keywords: Convergence; Flexibilization; Digital fabrication; Experimentation; Technopolitics.

Manufacture and digital construction

High-Low as expression of the Brazilian digital fabrication

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This paper is the result of an investigation about the influence of digital processes in Design and its importance in innovation within ephemeral architecture through the concept of High-Low. The ephemeral architecture has the potential to combine academic and artistic knowledge to Brazilian commercial production. Here is presented one experimental case study designed to Expo Revestir for Docol in 2017 that balances the paradigm of computational design with the academic field and viable commercial applications.

Keywords: High-Low; File-to-Factory; Ephemeral Architecture; Computational Design;

SESSION **14**

PROF. SÉRGIO MASCARENHAS ROOM (IFSC.USP)
08/11/18 14h00
SESSION COORDINATOR **RODRIGO MARTIN IGLESIAS**

Theories and design practices in digital contexts

Informed Matter, Design and its Relationship to Force Dynamics

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The form can be described as the action of a force on matter, so this research turned to the essence of this fact of reality to objectively confront it, explore its methods of representation and challenge our design responses. The spaces of topological order that were perceived in the results move away from concrete imaginaries, symbols and metaphors; the design was the result of the information and the matter acted as an informed mass that was modeled from different forces that acted on it. This general research had as its general objective to understand the real, this reality understood as an abstract formal structure, which is based on complex scientific and experimental work, within the digital world.

Keywords: Forces Dynamics, Simulation, Design, Technologies, Data.

SESSION 14

Theories and design practices in digital contexts

About (relatively) common operations in digital architectures

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Many different types of algorithms have been associated to gain complex shapes. They give rise to a large set of unusual forms, through calculations based on computational geometries, self-organizing systems, rule-based systems, and optimization, often still assembled in morphogenesis principles. Many of these discoveries mimic physical, chemical, and even behavioral principles at the edge of this code-translated knowledge. Thus, any new form, the result of this exploratory perspective, can mean some progress. If the understanding of specific algorithmic characteristics has validity (for precise programming), generic concepts are also important for simplifying procedures and presenting general concepts of the result.

Keywords: Digital architecture; Computational geometry; Visual expression; Syntax generalities.

Morphogenesis, synthesis and analysis of forms

Digital morphogenesis and tectonics: an analysis of Peter Eisenman's Aronoff Center

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The concept of architectural tectonics relates simultaneously to pragmatic and poetic aspects of the materiality, aiming the expression of these concerns in the result of the Form. Far from only a theoretical concerning, these design decisions affect how our society employs its natural and human resources. This work takes the Aronoff Center for Design and Arts (1988-1996), by Peter Eisenman, as a case study for a graphical analysis, dealing with the consequences of a free-form morphogenesis to its construction and investigating the tectonics of the contemporary architecture.

Keywords: Contemporary Architecture; Digital Project; Tectonics; Peter Eisenman; Aronoff Center.

Theories and design practices in digital contexts

From object to process; conceptual matrices in architecture's expanded field

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The article focuses on the development of a diagrammatic method of design processes based on the elaboration of conceptual matrices that embrace the reading of some of Zaha Hadid 's design projects. The object of study is approached through its formative process, considering its continuous evolution, in a dynamic field of interactions and mediations. The architectural works studied, generated several diagrams through the research of their 'formative concepts' (Clark & Pause) , later defined, as 'operative categories'. The definition follows the understanding of the architect's work as non-linear sequences of projective actions. The project`s study, found similar strategies, which are generated as projective series, through similar spatial expressions and methods of conception.

Keywords: Design Processes; Zaha Hadid; Digital Technology; Contemporary Architecture

Theories and design practices in digital contexts

White Cube in Evolution: Lighting and Digital Technology in Beyeler Foundation Architecture

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This document aims to analyze the lighting system design at the Beyeler Foundation, which is controlled by digital devices. The domination of light is considered its architectural achievement, which generates a peculiar spatial effect. The discussion draws on the white cube concept, as applied in exhibition spaces, on the notion of device, as proposed by Flusser, and on the black box expounded by Latour's theory. The design is understood as the evolution of the white cube, since it maintains the premise of neutral space, but also remains open to the external environment through a glass roof equipped with computerized shutters.

Keywords: Museum architecture lighting; Digital technology; White cube; Device; Black box.

Theories and design practices in digital contexts

Towards a democratic approach on public lighting: remote systems based on Metadesign

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This research explores Metadesign(Giaccardi, 2003)as an innovative framework on the design of urban lighting systems. We hypothesize that a system based on this mode of design can bring breakthroughs that could cope with ill-defined problems in urban lighting design. Therefore, the aim is to propose alighting system in support of participation through interaction at use time. In this sense, by comprehending lighting infrastructures as sociotechnical environments, we believe Metadesign could cope with emergent needs arising in the context of personally meaningful activities andcould empower users to engage actively in their systems development and evolution.

Keywords: Metadesign; Participation at use time; Sociotechnical systems; Urban lighting design

SESSION **15**

CETEPE ROOM 01 (EESC.USP)
08/11/18 14h00
SESSION COORDINATOR **PAULA GOMEZ-ZAMORA**

Interfaces and devices

Representation of architectural cultural exchange in Rio de Janeiro using augmented reality

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This paper describes the digital augmentation of a book on the contribution of foreign architects to Rio de Janeiro in the first decades of the 20th century. It focuses on the process of modeling and displaying 3D models of the buildings using the book pages as AR targets. It discusses the concept of augmented reality as the perception of a symbolic layer on real space; and AR as an artistic practice of spatial appropriation and hierarchical disruption.

Keywords: Locativa media; Augmented reality; Rio de Janeiro; 20th century urbanization

SESSION 15

Teaching, research and extension in digital contexts

Virtual Paths: Collaborations in Narratives of Cultural Heritage of São Carlos-SP

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The "Virtual Paths: Collaborations in Narratives of Cultural Heritage of São Carlos" Extension Project sought to analyze the use of the QR Code, which directs the user to an online portal containing information about historical buildings in São Carlos, to complement the dissemination of the city's cultural heritage. As a pilot case, during the year of research, QR Codes were developed for the São Carlos Railway Station. This process seeks to diversify the dissemination of information on heritage and promote greater engagement of the local community, as an invitation to an augmented tour through the monuments of the city.

Keywords: Cultural heritage; Digital media; QR Code.

Interfaces and devices

Content mediation and digital technology in museums: design strategies to enrich the visitor's experience

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This paper aims to identify design strategies that integrate digital computational technologies to artifacts and installations for the interaction of museum visitors. Elements that enable the visitation experience to be satisfactory are identified through a recognition study of proposals for content mediating artifacts in museums based on theoretical aspects relevant to the understanding of human interaction with technology. It generates a classification of relevant design techniques from the cases listed on the analysis.

Keywords: Museum; Technology; Human-Computer Interaction; Cybernetics.

Interfaces and devices

Use of digital technology in museums: the knowledge construction about art mediated by artificial intelligence

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This paper aims to identify usability aspects arising from the interaction of museum visitors - with content mediation artifacts that use digital technology - in order to perceive design guidelines aimed at enhancing the visitor's construction of knowledge. This was analyzed by the observation – in an audio and video survey - of fifteen users interacting with artificial intelligence as a guide to the museum experience on the project A Voz da Arte in the Pinacoteca de São Paulo museum.

Keywords: Museum; Technology; Artificial Intelligence; Human--Computer Interaction; Activity Theory.

Interfaces and devices

Use of Dense Stereo Matching for Existing Building Documentation: Comparative Analysis of Tools

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This paper presents a comparative study of Dense Stereo Matching (DSM) tools to generate point cloud from digital photogrammetric restitution. The capability of four different state-of-the-art software systems as Photoscan (Agisoft), 3DF Zephyr Free (3Dflow), Remake (Autodesk) and Recap 360 (Autodesk) is examined to document a historical object. The main aspects compared are: processing time, export file formats, file size, quality and density of point clouds obtained from tools standard parameters. From the literature review, the analysis and the experiments, it is possible to evaluate the potential of DSM technique for the existing building documentation.

Keywords: Dense Stereo Matching (DSM); Digital photogrammetry; DSM tools; Point cloud; Triangular irregular network (TIN).

SESSION 15

Information, models and simulations

BIM and Aerial Photogrammetry: building documentation of E1 - USP São Carlos

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This article demonstrates the integration process of aerial photogrammetry and BIM technologies for the purpose of supplying gaps in building documentation, resulting of changes during use-operation and maintenance of a historical building; as well as to record and document the project for future demands. For that, a research field was carried out with a RPAS – Remotely Piloted Aircraft Systems; and a study of the case of the E1 building, at USP São Carlos, a representative of the modern brazilian architecture, with few sources of information. The results demonstrate a satisfactory quality in the generation of orthomosaics for building documentation and consistent record for BIM as-is models

Keywords: Aerial Photogrammetry; BIM; Building documentation.

SESSION 16

JORGE CARON ROOM (EESC.USP)
08/11/18 16h30
SESSION COORDINATOR **MARCELO BERNAL**

Interfaces and devices

PZ Smart Flooring System: Spatiotemporal Occupancy Analyses for Architecture

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This paper introduces, first, the value of obtaining dynamic information through smart environments for Architecture feedback at building scale. Second, it describes the co-evolution of the systems design for specific sensitivities required to perform meaningful analyses for the different scales. Third, it presents the significance of obtaining spatial and temporal occupancy data of high resolution, allowing significant new architectural analyses to emerge. Furthermore, it concludes by describing the vision for the future trajectory of this line of research.

Keywords: Smart Environments, Smart Buildings; Smart Flooring Systems; Post-occupancy Analyses; Spatiotemporal Occupancy; Piezo-based Flooring.

Morphogenesis, synthesis and analysis of forms

Pilot study of numerical modeling tool to evaluate the thermal performance of walls according to Brazilian standards

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The paper discusses a numerical modeling tool to evaluate thermal performance of building envelope according to Brazilian NBR15.220 and NBR 15.575 standards. Contemporary integrated design processes require the development of early design stage decision support mechanisms in order to optimize building performance. The development of the proposed tool focused on early stage decisions on building envelope design and integrating tool usability in the design process. Results indicate that the proposed tool provides basis for decision making that respond to Brazilian standards previously disregarded by participants. Also indicate improved understanding on parameters that affect building envelope thermal performance.

Keywords: Thermal performance, Numeric modeling tool, Building envelope, Evidence Based Design.

Information, models and simulations

Thermal Comfort Clustering; Climate Classification in Colombia

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Our goal is to develop a climatic classification system that extends understanding of human comfort and guides the design of buildings to provide greater thermal comfort to occupants. We propose that using k-means clustering with multivariate climate data a classification system can be defined to objectively represent comfort zones in the tropics. Our study focuses on Colombia, but the approach extends to other countries located in the tropics.

Keywords: Human comfort; climate classification; clustering

Information, models and simulations

Noise Solver for Refurbishment Construction Site Design

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The noise generated by the presence of a construction site within complex structure in operation (e.g. school, hospital) is a problem that too often is underestimated but that can generate problems of different nature, both concerning the health of the actors involved and regarding the performance of daily activities present within such structures (e.g. carrying out a lesson, a surgical procedure). The main aim of our tool is to highlight the impact of the noise generated by the construction site activities on these daily activities and to allow the simulation in real time of the viable solutions, thus arriving to find the one that is considered most suitable.

Keywords: Hospital refurbishment; Construction site design; Noise reduction; Simulation.

Design synthesis and performance: simulation, discussion and generative strategies

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Since the publication of the book Performance architecture: beyond instrumentality (KOLAREVIC and MALKAWI,2004), architects have used a good performance as a guideline for the projects. This research proposes to investigate the possibilities and limitations of one of the guidelines through the incorporation of instantaneous aerodynamics in the parametric design context, from the use of parametric modeling techniques, electronic microcontrollers and computational extensions to promote the connection between them. From the construction of this artifact, we expect to develop strategies for including performance simulations in the processes of synthesis in architecture.

Keywords: Ventilation; Wind-sensors; Parametric Design, Arduino.

SESSION **17**

LUIZ GASTÃO DE CASTRO LIMA ROOM (EESC.USP)
08/11/18 16h30
SESSION COORDINATOR **MARIA ELENA TOSELLO**

Digital technologies and society

Technopolitics and participatory processes - Interactions between digital networks and streets in Lisbon

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This article presents a survey and analysis of the technopolitical devices created in projects of local initiatives carried out in Lisbon, within the scope of the Neighborhoods and Zones of Priority Intervention program, of the City Council. The methodology adopted is based on the reading of the projects, analysis of the technopolitics encountered and interviews with representatives of the entities that proposed them. In this way, it was possible to observe tendencies, potentialities and difficulties faced in the proposal and use of technopolitics in the scope of these projects, which allowed to conclude that the digital dimension has an important role in the reinforcement and expansion of an existing articulation in the territories, between partner entities and communities.

Keywords: Technopolitics; Lisbon; observatory; community-based action; digital technology.

Digital technologies and society

IndAtlas - Technopolitic platform for urban investigation

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This article presents the project of the urban research platform IndAtlas, currently in early development stage by UFMG's Research Group Indisciplinar. Through the association of crowdsourcing tools, a spatial database and the production of visualizations of different types, it is intended to create a Web platform for collecting, analyzing and depicting information about processes of production and transformation of urban space. It is proposed that the phenomena (themes) investigated in the platform are approached mainly from four axes: 1) spatial / territorial; 2) temporal; 3) social; 4) communicational. To do this, we try to combine online collaborative maps with the production of dynamic timelines and visualizations of networks of social actors (graphs), connected with social networks and Wiki pages.

Keywords: IndAtlas, Crowdsourcing, Tecnopolíticas Urbanas, Cartografias Digitais, Dados Espaciais.

Digital technologies and society

Speculative cartography and the formation of public interest issues

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This work discusses how locative media and the democratization of geoprocessing technologies have reconfigured our experience with the urban space, opening up new territories for the construction of the public. It also discusses perspectives and challenges that speculative practices with locative media bring to disciplines such as design, architecture and engineering, and to the production of more sustainable ways of life. For that matter, this work presents some experiments with locative media and digital cartographies that aim to give visibility to our social relation with the urban space and to support processes of sense-making about issues of public interest.

Keywords: Locative media; Critical cartography; Social cartography; Speculative design.

Creative industries and artistic practices

Museum of the Underway Artists - Metanarratives on Networks

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This article draws attention to an experience of workshop Masp. Etc.Br carried out by the Research Group Aesthetics of Memory of the 21st Century at the São Paulo Museum of Art (MASP), in which an aesthetic mapping of Paulista Avenue was done to discuss collaborative processes of image production organized through hashtags. The material gathered was an ample set of images posted on Instagram. After two collaborative edition processes, a final version was projected as a video at the free span of the Museum. These experiences bring attention to the aesthetics of the database and narratives in social networks.

Keywords: São Paulo Museum of Art; MASP; Paulista Avenue; Public space; Database Aesthetics.

Creative industries and artistic practices

Urban digital simulators as knowledge catalysts: a case study on the soundscape of Rio de Janeiro city center

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This paper discusses about urban digital simulators, focusing on soundscape representation aided by game engines. Digital modelling techniques have evolved and new approaches emerged, offering novel ways of experiencing the digital realm. Within soundscapes studies, the videogame media and the game design process offer interesting ways of dealing with sound phenomena, space and time. This paper describes a prototype, as part of an ongoing lab research, that simulates the soundscape of a specific site in Rio de Janeiro using game engine technology,

Keywords: Simulator; Sound landscape; Soundscape; Video game.

SESSION 17

Digital technologies and society

BIM and Public Bidding in Brazil

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This paper aims to describe and comment on recent advances in the adoption of BIM in Brazilian public bids. We give a brief account of this trajectory, in all its aspects and we analyze the recent federal decree 9377/18 that created a national strategy for the implementation of BIM in the public sector and compare it with the current regulatory background and the recessive momentum of AEC sector in Brazil.

Keywords: BIM; Public bidding; Brazilian regulation framework; Brazilian architectural design; Brazilian building environment.

SESSION **18**

PROF. SÉRGIO MASCARENHAS ROOM (IFSC.USP)
08/11/18 16h30
SESSION COORDINATOR **SIMONE VIZIOLI**

Manufacture and digital construction

Industry 4.0 and the Civil Construction in Brazil

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This paper aims to make an exploratory research about the dissemination of the purpose of Industry 4.0 concept in Brazil, that was introduced by Germany in 2011, especially in Architecture, Engineering and Construction sector. For this aim it was made a survey in magazines on line. As results was verified that the area that is discussing the concept are essentially productions engineering with a inexpressive repercussion in civil construction.

Keywords: Industry 4.0, Digital Fabrication, Technopolítics, Brazil.

SESSION 18

Morphogenesis, synthesis and analysis of forms

The Use of High Low Architecture in the Creation of Alternative Construction Elements

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This study presents an investigation on how the use of digital tools in the fields of architecture and engineering can help establish a connection between the architectural projects developed within Universities and what is produced by the construction industry, consolidating a critical design process that reflects on the use of current technologies. To do so, it will be necessary to employ knowledge gathered from the intersecting areas of architecture, computation and engineering to rethink the use of common materials directing it towards a non-specialized workforce, a relationship that can be defined as high-low architecture.

Keywords: High-Low Architecture; Concrete block; Digital tools; Performance-based design; Construction industry.

Manufacture and digital construction

Thinking the fabrication of complex components in nowadays context

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Thanks to the influence of innovative technologies is possible to build complex shapes using sophisticated software and digital equipment capable to work with a huge amount of data. The aim of this paper is to discuss the design and production from the fence panels of United Arab Emirates (UAE) pavilion at International Exhibition in 2015 and the Tower CityLife Milano from Zaha Hadid's office, in an attempt to understand how the customized components of the building walls were developed.

Keywords: Design for production; Design for manufacturing; Digital fabrication; Fabrication process; Mass customization.

Manufacture and digital construction

Optimization of a constructive system of subtractive digital fabrication: Prototypes and tests os fitting system

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Aiming the application of digital fabrication in the production of architectural structures, the experiment described in this work focuses on the constructive system in wood from connections machined in a CNC Router. We aim to reduce costs, machining time, weight and reach structural improvements in the system. This article describes the process of design, fabrication and structural tests adapting the open source constructive system of subtractive digital manufacturing (wikihouse).

Keywords: Wikihouse; Digital fabrication; Wood joints; Experimentation; CNC router.

Manufacture and digital construction

WikiHouse: A Generative and parametric tool to customize curved geometries

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Current research departs from the WikiHouse an open-source constructive system that enables self-construction and customization in engineered wood. The public platform favours the design and construction using CNC technology and digital manufacture. However, the system application and form vocabulary are bounded to orthogonal profiles geometry. Current research intended to automate the system in an algorithm and to expand the design to curved geometries, what was tested using digital fabrication in 1:1. The system developed allows the personalization of solutions of shell-like geometries that might use less material in more robust solutions, opening new design possibilities for the system.

Keywords: WikiHouse; Digital fabrication; Open Source; Parametric design; curved geometries

Manufacture and digital construction

Research pavilions: contributions to the advancement of digital technologies, tectonics and materials in architecture

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This paper presents partial results of a research dedicated to the architectural typology of temporary pavilions, focused in research pavilions developed by academic research groups. The relevance of these pavilions is evidenced for the development of new paradigms of design, as well as of the constructive possibilities offered by advanced technologies of digital manufacturing, like robotic arms. These innovative processes have been transported from the academy to the professional branch, but still in a timely application. However, they have already had a profound impact on the academic research institutions, adding a significant theoretical/ practical contribution to the contemporary architectural field.

Keywords: Temporary pavilions; Digital manufacturing; Robotic fabrication; Construction materials; Biomimetic architecture.

SESSION 19

JORGE CARON ROOM (EESC.USP)
09/11/18 14h00
SESSION COORDINATOR **ANJA PRATSCHKE**

Teaching, research and extension in digital contexts

Architectural Design Digital Change: Interactivity policy

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Several researches have been focused on digital architecture historical perspectives of the design throughout the sixties. This paper purposes a different view based on the influence of art, science and computation in architecture that contributed to the use of interactivity in architectural design. The aim is to describe the evolution of interactive CAD from MIT's Project CAD and Ivan Sutherland's Sketchpad to the early digital architectural design pioneers: Steven Coons, Gyorgy Kepes and Nicholas Negroponte.

Keywords: Digital Architecture, Sketchpad, CAD, MIT

Teaching, research and extension in digital contexts

Perceive to learn to perceive: an experience with virtual reality devices for architecture design learning

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This work investigates the potential use of low-cost virtual reality (VR) devices in architectural education to improve spatial perception of undergraduate architecture students. The experiment involved a gradual approach into the design process, starting with an intervention on a physical space, its bidimensional representation, 3d modelling and immersion in VR. After the immersion, students answered a questionnaire with open and closed-questions about their experience, and their evaluation of the use of VR in the designing. The findings point to the use of VR as a means to explore, perceive and reflect on decisions, allowing students a better understanding of designing.

Keywords: Virtual reality; Architectural design; Architecture teaching; Representation; Low-cost devices.

Creative industries and artistic practices

Connect, Motivate, Communicate: A Foundation for Gamification in Planning Communication

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Planning in the urban context is always a complex task in which the diverse interests of different stakeholders have to be weighed up against each other. For this to happen, communication is the key leading to successful and sustainable solutions. Often objective factors like the number and diversity of participating stakeholders is the benchmark for successful planning processes. We examine the motivational factors of the different main stakeholder groups and give an insight in the complex system of motivational and hindering factors that need to be considered when designing engaging sensible and sustainable exchange of knowledge and interests.

Keywords: Motivation; Gamification; Communication; Participation; Collaboration.

Teaching, research and extension in digital contexts

The Use of Multi-Software in Undergraduate Architectural Design Studio Education: A Case Study

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In the architectural design process, instead of using the computer programs effectively, the ability of choosing the most suitable program for the purpose takes place. However, different programs used in the design process serve different purposes. Therefore, the use of more than one program throughout the project design process arises. Every day the number of programs used increases rapidly. Hence, the designers find difficult to adapt this speed. The same applies to the students of architectural design studio course. Therefore, in this study with undergraduate architecture students, a pilot study focusing on the use of multi-software was conducted within the scope of architectural design studio. The process and outputs were evaluated.

Keywords: Use of multi-software; Contextual design; Architectural design education; CAAD

Teaching, research and extension in digital contexts

The creative process in architectural design on a digital environment: an experience with beginner students

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This article presents some results in the architectural design course, which were obtained by under graduate students in two experimental class organized at Federal University of Bahia in 2016 and 2017 years. The class Studio I, with incoming students (2016) and Integrated Digital Studio, with beginners and sophomore students (2017), were planned to have their activities developed in a digital environment, using geometric modeling as the main resource for the architectural design. The results obtained show maturity and autonomy of the students related to architectural designing and the use of digital resources.

Keywords: Architectural design; Architectural design teaching; Geometric Modeling; CAAD.

Teaching, research and extension in digital contexts

Creating Non-standard Spaces via 3D Modeling and Simulation: A Case Study

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Especially in the film industry, architectural spaces away from Euclidean geometry are brought to foreground. The best environment in which such spaces can be designed, is undoubtedly the 3D modeling environment. In this study, an experimental study was carried out on the creation of alternative spaces with undergraduate architectural students. Via using 3D modeling and various simulation techniques in the Maya software, students created spaces, which were away from the traditional architectural spaces. Thus, in addition to learning the 3D modeling software, architectural students learned to use animation and simulation as a part of design, not just as a presentation tool, and opening up new horizons for non-standard spaces was provided.

Keywords: 3D Modeling; Simulation; Animation; CAAD; Maya; Non-standard spaces.

SESSION **20**

LUIZ GASTÃO DE CASTRO LIMA ROOM (EESC.USP)
09/11/18 14h00
SESSION COORDINATOR **UNDERLÉA BRUSCATO**

Theories and design practices in digital contexts

The future of architects' digital records: how to preserve algorithmic design?

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Recently architects and archivists started to consider solutions for the digitization of architectural records and conservation of born-digital files. Documenting, organizing, cataloguing, archiving, preserving and accessing files are essential tasks to preserve architects' digital records. With the increasing quantity of algorithmic design another aspect of the digital design must be on architects' agenda: the memory of the design process. This paper emphasises the importance of preserving digital architecture records in accessible and sustainable formats for the generations to come. This paper demonstrates a strategy to document visual programming algorithm files allowing to archive, study, interpret or replicate them.

Keywords: Algorithmic design; ICT; Architecture digital records; Metadata; Memory

Theories and design practices in digital contexts

The Inclusion of decentralized and self-organized system in the process of construction of design thinking

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This work exposes the possible composition of a system composed of "crowd-working" of static, inert, flexible architecture elements, similar or identical entities, the "tesserae" and the integration with the link generated with Artificial Intelligence artifacts, a complex adaptive system, as a first experimental step to developments of Nanomaterials and systems that respond to the construction of the projective thought of the architectural envelope. The research responds to a general strategy of theoretical revision, with inductive and mixed methods. The exploration work examines the relative space within the idea of reason and the social function of architecture.

Keywords: Autorganizados; Descentralizados; Nanorrobótica; Parametrisísmo; Envolvente Arquitectónica.

Teaching, research and extension in digital contexts

Mapping Design Processes Based on Intense Use of Digital Technologies

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Digital technologies, like Building Information Modeling (BIM), parametric design and digital fabrication, are increasingly being inserted in design processes as well as transforming them as changes are becoming necessary to adapt to this new reality. The purpose of this paper is to analyze the adoption of digital technologies and the way it is influencing design processes. The study is based on the application of a questionnaire to professionals from innovative practices. Results were thematically categorized, which made it possible to verify that benefits prevail but there are also some difficulties, even when it comes to firms already using digital technologies.

Keywords: Digital technologies; Contemporary design process; Architectural practice.

Teaching, research and extension in digital contexts

Virtual Reality as a tool to regain tactual procedures in digital design

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This article aims to analyze the transformations undergone in design since the implementation of the digital processes. Seeking to discuss the limits for the construction of an operational model that does not act directly on the generated form and where the gesture and the materiality lost their place. In this sense, this paper proposes a project experience based on the interaction between analogue and virtual reality tools, allowing the retrieval of tactile and material interactions, with the direct manipulation of the final shape of the object in a digital design environment.

Keywords: Digital design; Tactual; Materiality; Virtual reality; Gesture.

Geodesign: A metametodology in the teaching of the project process in the School of Architecture and Urbanism of the UFPE

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In 2001, discussions began on the elaboration of a new Pedagogical Project (PPC) for the School of Architecture and Urbanism (CAU) of the Federal University of Pernambuco (UFPE), but only in 2010 a proposal was presented utilizing new didactic-pedagogical concepts and dynamics. After eight years of its implementation, and without a formal evaluation, it was verified the lack of a methodology that manages the teaching process according to the principles formulated in the PPC2010. This article consists of the analysis of the teaching of the CAU /UFPE design process. It also contains a proposal`s presentation to update the curricular structure through the meta-methodology of Geodesign. The proposal strives for a better flow of information, integration and contextualization of contents.

Keywords: Geodesign; Architectural project; Project teaching.

SESSION **21**

PROF. SÉRGIO MASCARENHAS ROOM (IFSC.USP)
09/11/18 14h00
SESSION COORDINATOR **ADRIANE BORDA**

Teaching, research and extension in digital contexts

Teaching BIM modeling in the architecture course: using a Blended Learning Strategy

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From the second year of the architecture course, a discipline is offered to introduce the BIM concept using an architectural modeling software. To optimize learning in the discipline and allow students to have a face-to-face period to discuss BIM theory, the use of Blended Learning was proposed - a learning method that combines face-to-face classroom interactivity in a physical space with digital media and online activities. For this purpose, video classes with BIM modeling tutorials were developed. The employed process proved to be efficient and may be an alternative to the conventional learning process in architecture.

Keywords: BIM; Building Information Modeling; Blended Learning; Architecture; Teaching.

Teaching, research and extension in digital contexts

A comparative diagnosis of students' proficiency in BIM in construction-related graduate programs in Brazil and in the United States

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Although BIM has been transforming the AEC industry worldwide, the quality of BIM education is still unclear. In an effort to investigate the current state of BIM integration into higher education curricula, the main goal of this study was to evaluate, compare, and reflect on students' proficiency in BIM between two very distinct graduate courses in Brazil and in the United States. Findings suggest a critical lack of knowledge, either foundational (in the U.S.) or procedural knowledge (in Brazil). Finally, measures that could improve the students' proficiency in BIM are suggested.

Keywords: Building Information Modeling; Construction education; BIM proficiency; Collaborative environments.

Teaching, research and extension in digital contexts

CAD and BIM tools in Teaching of Graphic Representation for Engineering

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BIM technology has represented an advance and a break of the design process' paradigm, impacting both academia and construction market. Reporting a didactic experience in the Civil Engineering graduation, this article aims to understand the teaching and learning process of graphic representation, by using CAD and BIM tools. The research included Literature Review and Empirical Study, whose data collection was based on the application of questionnaires, practical exercises and theoretical test with the students. As a contribution, we highline the complementary nature of the tools and the potentialities of BIM for teaching graphic representation.

Keywords: Graphic Representation; CAD System Education; CAE System Education. BIM.

Information, models and simulations

Facade hollow brick (cobogó) 3D scanning: natural light admission analysis and comparison with original digital 3D model

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The cobogó is a hollow brick used for light and ventilation control, besides having an important aesthetic function. With computer graphics, 3d digital models can be used during the design process to verify these functions. Thus, the goal of this paper is to compare and analyze the different digital 3D models obtained (built virtually or through 3D scanning) of a cobogó existing in the Brazilian market, so that visual and lighting differences can be observed, and how these differences can impact the design process.

Keywords: Cobogós; 3D Scanning; Parametric Design; Climatic Analysis; 3D model.

Impressions of a touristic route: between the null-dimensional and the three-dimensional

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This paper reports the experience of a public university digital manufacturing laboratory in producing tactile models to support a tourist route in a historic center. The report includes the reflection on the social and formative, cultural and professional meaning attributed to this production. For this, it uses the theory of the climbing of abstraction, by Vilém Flusser, problematizing the dimensional logic of the media used. This is the representation of the architectural set of the surroundings of a square. Architecture students were involved in the production of the models which were validated by visually impaired individuals.

Keywords: Tactile models; Universal design; Digital manufacturing; Architectural heritage; Tourist route.

SESSION **22**

CETEPE ROOM 01 (EESC.USP)
09/11/18 14h
SESSION COORDINATOR **LUCIANO B. DA COSTA**

Teaching, research and extension in digital contexts

herm3TIC-tv: Prototype of a human and social sciences laboratory based on Deleuze-Guattari philosophy and the application of the new ICT

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Our social interactions, increasingly mediated by technology, require subjectivity singularization spaces. The philosophy of Deleuze-Guattari gives us the keys of a machinic device that can counter-actualize the generic arrengement we suffer, derived from media and technology. This space is considered as a scenic space but also scientific and analytical, developing what Deleuze-Guattari called schizoanalysis clinic but that we can also understand as the development of a proper and interdisciplinary methodology for the new laboratories of human and social sciences.

Keywords: Schizoanalysis; Visual arts; Interactives; Big data; Neuroimaging.

Interfaces and devices

A window to the autism: the political role of the difference of an objectile in the homogeneous school

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This paper approaches the insertion of an objectile in the homogeneous space of a school, looking to bring flexibility and responsiveness to assist a user with Autism Spectrum Disorder (ASD). The research concerns with photosensitivity, a problem faced by almost 25% of the children with autism (Miller-Horn; Spence; Takeoka, 2011). The study is based on the theories for ASD environments that speak of 'sensorial perception' and 'thinking with imagery' (Mostafa, 2008), and the coexistence of Sensory Design Theory and Neuro-Typical Method (Pomana, 2015). The result consists of a gadget developed in MIT App Inventor tool and a curtain that interact responsively through an Arduino code, for a new connection between the user and his surroundings.

Keywords: Objectile; Responsive Architecture; Architecture and autism; ASD; Inclusive school.

Interfaces and devices

Potential use of Internet of Things to support Life Cycle Assessment of buildings

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This article summarize the initial discoveries of doctoral research, whose the principal aim is to analyze the use of Internet of Things to support Life Cycle Assessment of buildings. The first cycle of this thesis consists a preliminary investigation on electronics newspapers that deal the integration LCA and IoT. The results reveals IoT technology could provide real-time data collection, possibility of Big Data collection and monitoring, and greater precision and reliability of data. IoT-Based LCA is very promissory and innovative. In this way, this research intends to bring a relevant contribution to architecture, engineering and construction (AEC).

Keywords: Life cycle assessment; Internet of Things; LCA; IoT.

Interfaces and devices

Wearable Technology: Healthcare Product Design For Participation Of Tetraplegics In Society

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This paper discusses technological and theoretical issues that conform the product design proposal called technological wearable: a system that integrates body and equipment for physical rehabilitation of quadriplegic patients and their participation into society. The relevance of the work is to enhance the malleability and performance efficiency of the current system, through product design with complex surfaces, in addition to its customization and optimization, with the implementation of an open source plug-in, reducing steps and inaccuracies, to give more autonomy to the patient and to generate discussions in the areas that can use the same process.

Keywords: Wearable; Healthcare Product Design; Tetraplegia; Complex Surfaces; Optimization

Drones, an air panopticon?

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Drones are not just a new technology or a fun toy airplane with remote control, they are also a possible new and silent control mechanism. It would not be the first time in history nor the last in which a technological advance is used to monitor society and impress upon it the power of the State. The particularity of this case is that not only could it be misused by the government, but also some members of society could come together in an anarchic movement that, for example, could invade people's privacy, as the fact of knowing the lack of control over this type of practices.

Keywords: Drones, VANT, intimidad, privacidad, seguridad.

ABSTRACTS WITHOUT PRESENTATION

Theories and design practices in digital contexts

Parametricism as style: the relationship between methodology of scientific research programmes and parametric design

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During the 1990s many architects, who dissociated from critical theory, were looking for new design methodologies that did not confine themselves as stylistic currents. One of these propractice movement is done by means of parametric design. Aiming to investigate the boundaries between methodology and style, this paper proposes to answer the question: does the parametric architecture constitute a new style, as Patrik Schumacher says? It reviews Heinrich Wölfflin concept of style in the contemporary context; it presents Imre Lakatos theory (methodology of scientific research programmes) and how Schumacher appropriates of it followed by a critical reflection on the limits of such appropriation.

Keywords: Parametric design; Style; Imre Lakatos; Patrik Schumacher.

Theories and design practices in digital contexts

Prototyping: A Politics of Memory

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This paper presents a view on the architectural prototype as an exteriorisation of human memory. Bernard Stiegler describes the politics of memory involved in the process of hypomnesis, in which memory is stored in technology. Stiegler's ideas with relation to the prototype were developed while working on a research prototype. Four modes of exteriorisation have been extracted from that process: the use of memory aids, the prototype as stepping stone for thought, the digitisation of fabrication, and the prototype used for communication. This analysis provides a pathway for making expert knowledge available and accessible as a common good.

Keywords: Prototype; Exteriorisation; Memory; Hypomnesic milieu.

Morphogenesis, synthesis and analysis of forms

Heritage at Stake: Computational Design Processes for Rescuing Mosul's Architectural Identity

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A generative algorithm for exploring the virtual design space of historic houses in the city of Mosul is presented. The method aims to progressively engage the spatial organization of traditional houses through investigating existing examples.

Keywords: Traditional Mosul houses; Generative design; Shape grammar; Computation; Iraq.

Theories and design practices in digital contexts

Structural skins over unstable soils

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This study aims to research and develop structural support and foundation strategies based on grid systems in city areas with unstable and dispersive soils. It focuses on the possibilities that the structural design with light systems proposed as a technological response/answer to this problem. It takes ravine settlements of Bajada Grande Neighborhood, (Paraná, Entre Rios), as a case-study, pursuing analysis the geotechnical and topographic aspects as initial parameters for the work.

Keywords: Digital modeling; Structural optimization; Parametrization.

Theories and design practices in digital contexts

Sharing Background Noise: Enactive Approach in Reading Auditory Space

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This paper conceptualizes the Auditory space in terms of hearing process by employing the Enactive Approach. In this context, this study aims investigate the spatial awareness and proposes a research methodology to achieve access to the auditory space where places share similar background noise. This methodology consists of two phases: field recording of the pre-determined route first explored by the Spectrogram Sound Analysis (SSA) technique, secondly with the participation of 8 subjects, a survey analysis based on listening to records captured from the predefined route. This research aims to reveal potential use of SSA by relating to survey examination as a new way of reading space.

Keywords: Background Noise, Auditory Space, Enactive Approach, Spectrogram, Survey Examination

Creative industries and artistic practices

SONIFICA – The New Bionic

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SONIFICA explores the notion of the Enhanced Body, turning the human body into an instrument by way of technology. It represents a new type of sonic spectacle where the architecture of the body is enhanced with 3D-printed devices that augment the performer's capacity.

Keywords: Trans-disciplinarity; Enhance; Sonic; Instruments; Prosthetic.

Morphogenesis, synthesis and analysis of forms

Systematic approach to design builds for freeform façade: AFA Cultural Center

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The design and construction of the complex, irregularly shaped, and curvilinear building forms are also known as freeform architecture, have gained an interest form architects and engineers. This paper presents how freeform façade designs are defined with its curvilinear geometric characteristics and the systematic approach that is used to design and implement them. The proposed method incorporates product design and integral façade construction approach at AFA Cultural Center freeform façade implementation. Therefore, the paper aims to improve the viability of the proposed method and decreasing the gap between the other disciplines and architects in a systematic way without losing the creativity of the architects.

Keywords: Parametric modeling; Systematic approach; Design thinking; System thinking; Freeform façade design.

Morphogenesis, synthesis and analysis of forms

Design of a Post-Disaster Temporary Living Space Through the Use of Shape Evolution

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As the increasing number of disasters taking place each year result in a larger number of people in need of urgent sheltering, temporary shelters become a more critical subject of architectural design. With this in mind, the aim of this study is to design a temporary post-disaster living space for the displaced people. Towards this aim, 2D layout possibilities are generated and evaluated with genetic algorithms. Different from the previous studies, the project focuses on the potential use of shape evolution and multi-objective genetic algorithms for the design of a disaster relief shelter. The results are expected to produce a holistic digital model that can respond to different post-disaster scenarios.

Keywords: Computational design; Emergency architecture; Genetic algorithms; Modularity; Mass customization.

Digital technologies and society

Inmotic design proposal articulated with the policies of the municipality of the City of Córdoba, Argentina

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It was proposed to investigate and develop technological advances, considering the intensive presence of digital and hybrid technologies in everyday life. These technologies were used, including advances in design, applying them in useful design proposals for a specific urban space, called interstitial. The team developed a physical space for the dissemination of the twitter of the Municipal Culture Secretary of the City of Córdoba what democratizing the information so that it is available to everyone.

Keywords: Urban micro-architecture; Inmótics; Self-service information; City Government.

Morphogenesis, synthesis and analysis of forms

2 BITS: A case of mass customization for social housing

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This work presents a design for mass customization of modular housing applied to the Brazilian case, through modeling in grasshopper. These parametric tools contribute to an increase in the flexibility of the decisions and allow the execution, generating a wide range of solutions for the same problem. As a case study, it was considered the environmental disaster which occurred in the city of Mariana, whose homeless population remains displaced. Although in the initial phase of studies, this modular housing model aims to discuss principles of variability, flexibility, and prefabrication, delegating more decisions to end-users of large-scale social housing.

Keywords: mass customization; parametric design; social housing

Digital technologies and society

Makers experiences: Upcycling, interfaces and reactive devices in Industrial Design

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The Maker culture emphasizes collaborative learning and distributed knowledge. Expands exponentially the multiplicity of resources and possible processes. Finding effective and efficient ways to use them to develop predictive models that focus decision-making towards performance-oriented designs is the new challenge. Through the application of didactic strategies of problem-based learning will analyze five experiences of the degree of Industrial Design, Course IMD, National University of the Littoral based on logic of personalized manufacturing, augmented graphic thinking and collective creation.

Keywords: Crowthinking; Upcycling; Arduino; Visual programming

Information, models and simulations

Comparative Analysis of Geospatial Visualization Tools for Urban Zoning Planning

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The collective management of urban environment is a challenging task. Although considering the individuals and their values helps to build environments that are closer to the user's expectations, the identification of these aspects is not an easy task. Considering the potential of exploring visualization tools to support public participation, this paper compares two different 3D tools based on parametric modeling. Reinforcing the relevancy of both methods in promoting the visualization through the process of regulating the urban landscape resulting from the urban parameters, this paper aims to evaluate their performances concerning time consumed, training requirements, results and applicability.

Keywords: 3D Modeling; Parametric Modeling; CityEngine; Grashopper3D; Visualization

Information, models and simulations

Urban Analysis and Space Syntax Theory: study and mapping of the city of Juiz de Fora, Brazil

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This paper is a result of a research that uses the Space Syntax Theory for analysis of the city of Juiz de Fora, Brazil. After elaborating the axial map, based on data collection available by the City Hall, some analysis of the city were made using the syntactic measures: Integration HH, Mean Depth and Total Depth. The focus of the analysis was on the central area of the city, called "Central Triangle". As a result, the analyzes make it possible to identify that the initial urban center remains as the point of convergence of several urban areas of the city, consolidating itself as an area with great potential.

Keywords: Space Syntax; Urban analysis; Central area; Juiz de Fora.

Interfaces and devices

Design of fiduciary markers for its implementation in the urban area

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The mediation by Augmented Reality, allows to add layers of virtual information to reality in natural and intuitive ways, guaranteeing interactions in real time and generating new perceptual stimuli not necessarily remitted exclusively to the field of vision. Interaction devices such as fiduciary markers are resources generally associated with RA experience, however these markers of paper-usually turn out to be ephemeral when implementation is done in open spaces and high traffic. The following work presents results in the analysis of materials that guarantee to be ideal for the permanent implementation of markers in pedestrian urban routes.

Keywords: Augmented Reality; Fiduciary Markers; Visual Impairment; Computer Vision.

Interfaces and devices

Panorama-salon's Patent x Google Cardboad: reflections about 360° immersive digital experience

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This article is related to the research "The immersive experience in 360°: investigation, representation and digital immersion in the city of Rio de Janeiro in the 19th and 20th centuries", developed in University AAABBB. The present work will (re)think the Panorama in 'old-new' and 'new-old' views: panorama-salon's patent versus Google Cardboard Virtual Reality glasses. It will investigate these immersive systems in order to analyze the esthetics of portable immersive experiences. Thus, 1:1 scale models of Panorama-Salon and Google Cardboard will be built, with Rio de Janeiro's Panorama, the original engraving in Nepveu's patent, as the basis for this exploration.

Keywords: Panorama-salon; Google Cardboard; Realidade Virtual; Experiência imersiva; Panoramas do Rio de Janeiro.

Teaching,research and extension in digital contexts

Gamification of Educational Environments through Virtual Reality Platforms

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This paper proposes the experimentation of new information and communication technologies through the development of an experimental and interactive virtual reality application, where educational content and game mechanics are incorporated, in order to generate interactivity within a digital 3D space and promote academic exchange in an innovative way. This project aims to the exploration of an open 3D digital environment, where the modeling is inspired by some sector of the physical space of the authors' university, compatible for the incorporation of smart objects, avatars and a dialogue/activities system that deals with several educational topics.

Keywords: Avatar; Gamification; Hybrid worlds; Techno-politics; Virtual reality.

Teaching,research and extension in digital contexts

Citizens of the future: virtual reality as a visualization of possible narratives

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This article develops and analyses actions carried out with 5 to 13 years old children, realized in Campo Grande (Brazil) and Duclair (France). They offer the possibility to define the importance of physical spaces through narrated tales and children's interpretation by the mean of digital modeling and so virtual reality. The study's aim is to develop future citizens' sensitivity and critical eve regarding spaces, but also providing them tools so they can have a better perception over cities.

Keywords: Virtual reality; Tales; Childhood; Citizenship; Education.

Teaching,research and extension in digital contexts

3D modeling in the design course context: A didactic experience

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The use of informatic tools (computer-aided design) may be associated to designer tasks since the first phase of product conception until industrial production. By using these CAD tools during the initial design phase, it is possible to predict, identify and correct mistakes. This is an interdisciplinary article that presents and discusses an experience as a teacher of graphics computation II, offered to product design students. It also reveals the didactic methods and psychological approaches applied to address this challenge: Achievement motivation, pedagogy of autonomy and learning pyramid. The didactic experiment was positive and lead to interesting learning results.

Keywords: 3D modeling; CAD; Product design; Teaching; Learning.

Interfaces and devices

Cork: New uses in Architecture

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Cork usage is one of the most promising trends in sustainable development of materials, due to its unique natural properties, exceptionally good environmental qualities and its high potential to incorporate innovative technology. It can be reused, and it is built with renewable and reusable materials that contain lower levels of embedded energy and carbon. Today amongst other uses we see cork used as a textile for clothing, in automobile parts, and as a thermal shield in space crafts. However, there is still a lack of information and diffusion within the engineering and architecture sectors; stakeholders lack awareness of how to use and select cork materials for construction, compared with other competing products. This research plans to explore future cork industry developments, cork recycling and new cork-based materials, which are still in various stages of development with enormous potential for construction as an eco-friendly solution. The aim is to test or adapt them to be used in construction, with an emphasis in CAD/CAM fabrication processes. Hoping that in the future there will be greater application in architecture and eventually will contribute to greater sustainability in the construction business as well as the cork sector.

Keywords: Cork; Sustainable material; Materials engineers design; Architecture; Culture.

Creative industries and artistic practices

A gamified perspective in the learning of patrimonial architecture

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The article reports the process of gamification applied to an educational context. This process had the goal to verify the potential of a virtual location, a loft in colonial style, in learning patrimonial architecture. Five stages were carried out: content research for the virtual location's design; development of the game in Unreal Engine 4.16; application of the game and similar pedagogical content with two groups of students; comparative analysis of the different learning experiences of both groups of students; application of the EGameFlow with students who interacted with the game. The results showed that the tool has great pedagogical potential.

Keywords: Gamification; Patrimonial architecture; Learning

Creative industries and artistic practices

Artist´s book Poor Fish Memories in digital version

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The passages and combinations between analog and digital languages point to issues that have persisted for decades and which continue to foster contemporary, ethical and aesthetic debates about experience and temporality. Problematizing these questions, we extend the discussion to the importance of contemporary design to adopt creative strategies that articulate thoughts from other areas of knowledge, such as philosophy and art, from the perspective of multiplicity of mediums. The intention is to oxygenate classic design issues, such as conception, form creation, and user interaction, through the provocative sensory and temporal displacements that artistic creation promotes.

Keywords: Art; Design; Aesthetic experience; Temporality.

Digital technologies and society

Spatial Proxemics: experiments and contributions of anthropological relationships in digital media

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Proxemics was first defined by Edward. T. Hall as being the relations between non-verbal communications in a determined space. This paper aims to promote a theoretical interpolation between diverse study fields with new contemporary urbanism paradigms supported by technology and anthropological relations. In this optics, to provide a better understanding of possible characteristics within the proxemics theory can translate into a better spatial understanding and city improvement from an analysis methodology using digital tools.

Keywords: Proxemics; Architecture; Urbanism; Phenomenology; Digital space.

Creative industries and artistic practices

Guerrilla urbanism and digital production: a study of temporary occupation of public spaces

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The paper presents some of the spatial production involved in three events promoted by different organizations in the city of Brasilia, Brazil. The role of architecture was to materialize sensations, experiences and phenomena for the people who participated. This production defines a kind of urbanism produced by groups of people who are temporarily using public spaces of the city with creativity. Limited by minimum time and budgets, and located in a place where high technology is scarce, handcraft is a necessity in all production processes. The main intention is to analyze how the use of advanced technology corresponds to this type of situation.

Keywords: Parametric Design; Artistic Production; Ephemeral Architecture; Urban Intervention; Guerrilla Urbanism

Digital technologies and society

SimpliciDIY – Do-it-yourself wood building system

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Worldwide there is a big need for affordable livingspace. Globalization leads to a connection of development and ideas in the field of building. Open Source communities could improve and accelerate this development. The potential of theses communities lies in the connection of different diciplines. Especially for building projects with a small budget and a willingness to participate in the work process open source do-it-yourself constructions are a great opportunity to help cover the need of affordable work and living space. Renewable materials such as wood offer great potential here. New, standardised technologies make a decentralised production possible.

Keywords: Open source; Do it yourself; Wood construction; Bottom up; Affordable livingspace.

ABSTRACTS WITHOUT PRESENTATION

EXHIBITIONS

TECHNOPOLITICS TIMELINE

Technopolitics Working Group
Salão Primavera
November 6 to 9

The Vienna-based interdisciplinary research group Technopolitics will present an exhibition and workshop program under the umbrella term of "Curated Knowledge Space" at SIGraDi 2018.

The most prominent visual aspect of the project is the TECHNOPOLITICS TIMELINE. The timeline traces the Information Society from the year 1900 to today and contains about 500 entries of events that have contributed to the emergence and transformation of our era. These entries are organized in six horizontal categories and 12 vertical tags. Technopolitics will present the timeline as a print-out measuring 20 x 1.5 meters.

The timeline will be accompanied by audio-visual and printed material that contextualizes the entries and is assembled on a table in front of the timeline. An additional contextual layer is provided by three hyperlink network visualizations of the Timeline entries identified in multilingual Wikipedia that yield a crowd-sourced view on their semantic relationships.

Prior to the opening, a two-day invitation-only workshop will be held, bringing together researchers and artists for a cross-cultural examination, critique and revision of the timeline (currently v4.0). The results of the workshop will be visible as added edits on the timeline (resulting in Timeline v5.0), highlighting the processual and open-ended character of the project.

Within the format of the curated knowledge space, the timeline and the associated material provide the framework for an open-ended exploration of the genesis and current configuration of our shared techno-cultural realities. This will be achieved through a transcultural dialogue that is aimed at expanding and transforming the timeline. In workshops and lectures with artists, researchers and students the notion of the Information Society – and the events taken as central to its development – is challenged, assessed, and reformulated. Each new entry that results from these discussions replaces an existing entry and thus opens the Timeline to cultural, social and political diversity.

The development of the Technopolitics Timeline has taken place, from the beginning, as a collaborative process to allow different perspectives to coexist within a unifying but open framework. The relatively simple organizing principle of the timeline and its modular structure allow for multiple, parallel edits and bring together different perspectives, which make competing claims for relevancy to the global development of the Information Society.

An important common objective is to investigate large scale historical processes structured by techno-economic paradigms from a critical, explorative standpoint. Using postdisciplinary approaches, these processes are connected to the cultural

forms of the respective historical moment, including the participants' own contemporary work. Over the course of the project, a specific methodology has been developed, which centers around physical gatherings that combine formal presentation, open-ended discussions and convivial moments of eating and drinking together. The aim of the method is to produce substantial input but then allow the discussion to take on a life of its own beyond the constraints of the perspective presented in the formal part.

In 2015, the group initiated the long-term artistic research project TECHNOPOLITICS TIMELINE and presented the first version at the group show Social Glitch(curated by Sylvia Eckermann, Gerald Nestler and Maximilian Thoman, Kunstraum Niederoesterreich, Vienna). Timeline v2.0 was developed for a solo exhibition at MAK/Museum for Applied Arts, Vienna, in June 2016.

In cooperation with the media art festival Transmediale, Technopolitics set up a curated knowledge space at nGbK, Berlin and organized one of the main Transmediale conference panels at the Haus der Kulturen der Welt (January-February 2017).

In June 2017, Technopolitics presented the Timeline project at Connecting Spaces, Hong Kong. The curated knowledge space featured as a space for lectures, workshops and displays. The aim of the event was to establish a long-term engagement for intercultural and postdisciplinary exchange to challenge the Western conception of the Information Society – in this case from an East-Asian point of view.

Technopolitics Working Group is an independent, transdisciplinary platform of artists, journalists, researchers, designers and developers. In 2009, Armin Medosch and Brian Holmes launched it as an online discussion group and since 2011 a circle has formed, mainly in Vienna, that regularly meets for lectures and discussions and produces interdisciplinary conferences, art and research projects.

The group has convened more than 20 Technopolitics Evenings where artists and researchers present and discuss their current projects. Since 2014, the meetings have been complemented with a more public format, the Technopolitics Salons, at venues in Vienna and internationally.

Core Members of Technopolitics Working Group

In **Sylvia Eckermann**'s work, a discursive engagement with form and media culminates in critical artistic reflections about our entanglement as individuals in current socio-economic situations. She works with various media including digital and physical environments, installations, animations, videos, and sculptures. Eckermann is a pioneer of Game Art and the first recipient of the City of Vienna Award for Media Art (2014). She is the initiator and artistic director of the art series "The Future of Demonstration" (together with Gerald Nestler and Maximilian Thoman, 2017 / 2018).

Doron Goldfarb graduated in computer sciences from the Technical University Vienna and has contributed to numerous art and performance projects since the early 2000s. Currently, he is working on large scale e-science data infrastructures in the context of several EU research projects and is concluding his PhD in computer sciences in the area of Digital Humanities at the Technical University Vienna.

Gerald Nestler, PhD, is an artist and author who explores the "derivative condition" of social relations and its paradigmatic models, narratives, and processes. Among many other grants, he was awarded the Austrian State Award for Visual Art and the Austrian New York/ISCP residency grant. His work has been shown internationally and he has published widely, most recently the essay "Towards a Poietics of Resolution," in Journal for Research CulturesVol.1/1 and the special issue on art and finance, in Finance and Society(coedited with Suhail Malik, 2016). He holds a PhD from the Centre for Research Architecture, Goldsmith, University of London.

Felix Stalder, PhD, is a pioneer of net culture and research and the co-editor of the nettimemailing list. He is Professor for Digital Cultures and Network Theories at Zurich University of the Arts. Stalder's latest book, The Digital Condition, appeared 2018 at Polity.

Axel Stockburger, PhD, graduated from the University of Applied Arts, Vienna (Master Course for Visual Media Art headed by Prof. Peter Weibel). Between 2000 and 2006 he lived in London where he received a PhD following a scholarship awarded by the University of the Arts London. During this period, he was part of the media art group D-Fuse. Since 2006 he is an Assistant Professor at the Academy of Fine Arts Vienna. He is a member of the artist association Secession and his video works and installations are shown internationally.

Ina Zwerger is a journalist and has been working for the Austrian Public Radio (ORF) since 1988 – from 2000 to 2007 as a producer of the weekly series "matrix – computer & new media" and since 2007 as the director of the Ö1 education program "Radiokolleg." She has received the "Radiopreis der Erwachsenenbildung" (radio award for adult education) multiple times throughout her career. She has worked as co-initiator and curator of numerous symposia, among others Ars Electronica "Goodbye Privacy," 2007; "Creative Cities", Ö1 / ORF Radiokulturhaus, 2009; "Learning in the Network Society," 2011; "Map of a new civil society", Ö1 / ORF Radiokulturhaus, 2013.

HOMO FABER 2.0

"Homo Faber 2.0: Politics of Digital in Latin America" Exhibition

Cultural Center USP São Carlos

November 6 to 30

Curators

Rodrigo Scheeren (Universidade de São Paulo | Brazil)

Pablo C. Herrera (Universidad Peruana de Ciencias Aplicadas | Peru)

David M. Sperling (Universidade de São Paulo | Brazil)

Two decades have passed since the implementation, diffusion, and development of the use of digital fabrication in the areas of Computer-Aided Architecture Design (CAAD) in Latin America. Throughout this period, different temporalities and specificities in the region became noticeable. The first opportunity to capture and understand a part of this process happened during the CAAD Futures 2015 Conference - "The next city". From the initiative sponsored by professor Gabriela Celani (UNICAMP), professors David M. Sperling (USP) and Pablo C. Herrera (UPC) organized the exhibition "Homo Faber: Digital Fabrication in Latin America", which presented works from 24 consolidated and emerging laboratories from six South American countries that had been created between 2005 and 2014.

"Homo Faber 1.0" - how we call it - demonstrated for the first time to the world the potential of digital fabrication in Latin America. Conceived around the subject "Informing Materials and Materializing Forms" (Sperling and Herrera, 2015), this exhibition represented, until that date, the main effort to systematize, categorize and present processes and dynamics of digital fabrication in the fields of architecture, design, and construction.

In the context of the XXII Congress of the Iberoamerican Society of Digital Graphics (SIGraDi / São Carlos, Brazil - November 7th to 9th, 2018) that assumes "Technopolitics" as its central theme, Homo Faber 2.0 focuses on the "Politics of Digital in Latin America".

Montaner and Muxí (2011, p.65-66)*argue that "political action from the architecture has always existed, although there are professionals who deny such a relationship and who do politics by omission. If politics is the social organization of a group that is developed in a space, depending on where it is acting in the creation of this space, it will be inclusive or segregating, inclusive or exclusive, will be governed by the aspiration to redistribute quality of life or according to the perpetuation of exclusion and the domain of powers. That is why architecture is always political". From that approach, digital fabrication in architecture and design is no exception.

The chosen theme for this exhibition demonstrates how some uses of digital fabrication technologies, from their disruptive nature, impose new policies on processes, academic programs, curriculum development, production lines, implementations, and adoptions. Than, the aim of this exhibition is to being bound to politics and society, showing the potential of digital fabrication and its impact on communities, evidencing how the identity of the projects evolves the constant experimentation of form and material for the development of new products or the improvement of existent ones, from the object to the architectural scale.

For Homo Faber 2.0, the organizing committee selected 37 projects from a total

of 61 proposals. These projects, coming from nine countries in South and Central America, were distributed in three categories:

- 12 projects related to design collaboration processes for changes in society with activities aimed at citizens in particular and strategies of subversion in the use of digital technologies.

- 19 projects related to processes and prototypes of conceptual research using formal and material experimentation, as well as the technological development of new techniques and products.

- 6 projects related to artisan-digital hybridism / neocraft / cultural identity that promotes the mixed use of artisanal and digital techniques for the creation of the artifact.

In this edition, Homo Faber reflects a maturation of initiatives that enhance an approach to different scales towards the built environment. The investigated processes and resulted artifacts demonstrate an advance in the complexity of the proposals, scale of manufacturing, technical solutions, and materialities. The projects are largely linked to the local culture, recognized as a source of inspiration generating meaning for the flow of design and assembly. Laboratories arise with proposals increasingly associated with local problems, going from experiences referenced to the northern hemisphere to others that seek in their own reality and community a connection that values their identity.

Therefore, it is important to highlight that through the Homo Faber exhibitions, histories and backgrounds are traced, which will be the daily routine of other initiatives transformed by the reality of each community, city, and country. Finally, in this second version, we look for answers to local problems driven by experiences of not only a laboratory but of different contributions that enrich new digital fabrication policies and politics, not only for their own place but for their cities and the world.

The visibility of projects through Homo Faber demonstrates the opinion of Hans-Ulrich Obrist, for whom an exhibition expresses possibilities of connectivity, of creating bridges and networks between technology, politics and the community, driven by the perspective of the academia and the profession of architecture.

* Montaner, J. & Muxí, Z. (2011). Arquitectura y Política. Ensayos para mundos alternativos. Barcelona: Editorial Gustavo Gili.

Digital as a method: physical models, visualizations of architecture

Núcleo de Manufatura Avançada (NUMA-EESC-USP)
November 6 to 30

Curators:
Anja Pratschke (Universidade de São Paulo | Brazil),
Marcelo Tramontano (Universidade de São Paulo | Brazil)

Since the year of 2011, the Institute of Architecture and Urbanism of the University of São Paulo has been promoting the integration among its Computing and Modeling laboratories, and Architectural Design studios, both in the Teaching, Research and University Extension spheres. Such convergence strengthens the relationship between design processes, digital media for representing and organizing information, and manufacture of models and building components. The making of physical models aided by digital manufacturing techniques, from parametric computational modeling, plays a central role in the study of existing buildings as well as in different stages of design processes.

The exhibition "Digital as a method" proposes a reflection on the possibilities offered by digital media for expanding architectural design classical procedures, either through the use of computer modeling programs within a digital environment, or by constructing physical representations of buildings and their components.

All models presented have been designed and achieved by undergraduate students attending First and Third years mandatory courses in Architecture and Urbanism, aided by laser cutting and 3D printing machines, occasionally including conventional constructive techniques. The whole process also benefits from studies and experiments on parametric design and digital fabrication developed at Nomads.usp, the Center for Interactive Living Studies, from the same institution.

Models presented in the ZOOM OUT Section are a result of an exercise proposed by the First Year course of "Informatics in Architecture", under the responsibility of Prof. Dr. Anja Pratschke. The "Insight Architect" exercise aims to approach some aspects of the production of selected architects for its originality and recognition by scholars and professionals. It promotes a personal construction of a first repertoire of contemporary architectural production through initial readings aided by modeling processes. Building an electronic model, through BIM modeling, allows students to deepen concepts and techniques inherent to the use of parameterization in architecture. In the next step – the digital manufacturing of physical models from electronic models – students become familiar with laser cutting and 3D printing procedures and machinery. The 26 residential projects featured in this section have been selected from studies and achievements made available by the Make It Right Foundation. They share environmental and ecological concerns as well as low-cost strategies.

The ZOOM IN Section brings together 8 models produced in the architectural design studio "Project 3: Architecture, City, Landscape" of the Third Year, conducted by Profs. Drs. Marcelo Tramontano, Renato Anelli, Camila Moreno and Bruno Daminelli. They are a part of an exercise which aims to design a State High School according to FDE technical specifications, the Foundation for the Development of Education of the State of Sao Paulo. Projects are fully developed by using BIM software, from their initial design, closely related to the urban environment, to detailing stages, construction phases and cost estimation. Each group of seven students produces several partial and reduced physical models throughout the semester to support and enrich their design decisions. The physical models presented here seek to anticipate future buildings' constructive issues, by combining digital fabrication techniques and procedures similar to those to be used in the construction site.

WORKSHOPS

WRITING THE HISTORY OF THE PRESENT. COLLABORATIVE EDITING OF THE TECHNOPOLITICS TIMELINE

Technopolitics Working Group

Sylvia Eckermann, Doron Goldfarb, Gerald Nestler, Felix Stalder, Ina Zwerger

Monitors:
Gabriel Braulio Botasso and Nayara Araujo Benatti (Masters students at IAU-USP)

What are the relationships between artistic/intellectual practices and large-scale historical processes? How did the two evolve in the Information Society? Does the contemporary period represent a continuation of this evolution or does it constitute a transformative crisis leading to a new paradigm? These are some of the core questions that Technopolitics as an ongoing, international artistic research project is interested in.

The most prominent visual aspect of the project is the TECHNOPOLITICS TIMELINE. The timeline, as a print-out measuring 20 x 1.5 meters, traces the Information Society from the year 1900 to today and contains about 500 entries of events that have contributed to the emergence and transformation of our era. These entries are organized in six horizontal categories and 12 vertical tags.

The timeline will be accompanied by audio-visual and printed material that contextualizes the entries. An additional contextual layer is provided by three hyperlink network visualizations of the Timeline entries identified in multilingual Wikipedia that yield a crowd-sourced view on their semantic relationships.

Within the format of the curated knowledge space, the timeline and the associated material provide the framework for an open-ended exploration of the genesis and current configuration of our shared techno-cultural realities. This will be achieved through a transcultural dialogue that is aimed at expanding and transforming the timeline. In workshops and lectures with artists, researchers and students the notion of the Information Society – and the events taken as central to its development – is challenged, assessed, and reformulated. Each new entry that results from these discussions replaces an existing entry and thus opens the Timeline to cultural, social and political diversity.

The development of the Technopolitics Timeline has taken place, from the beginning, as a collaborative process to allow different perspectives to coexist within a unifying but open framework. The relatively simple organizing principle of the timeline and its modular structure allow for multiple, parallel edits and bring together different perspectives, which make competing claims for relevancy to the global development of the Information Society.

The workshop will be held, bringing together researchers and artists for a cross-cultural examination, critique and revision of the timeline (currently v4.0). The results of the workshop will be visible as added edits on the timeline (resulting in Timeline v5.0), highlighting the processual and open-ended character of the project.

Technopolitics is a Vienna-based interdisciplinary research group, as a platform of artists, journalists, researchers, designers and developers.

TALK – CONTEXTUALIZING THE TIMELINE ON THE WEB
Doron Goldfarb

Technopolitics member

Jorge Caron Room
November 5th: 18h00 - 19h00

(opened to the public)

This talk presents a data experiment performed in the context of the Technopolitics Timeline, during which its editors mapped individual entries to related multilingual Wikipedia articles. The mutual hyperlinks between these articles represent a complementary layer of semantic relations across the Timeline's content as perceived by the global Wikipedia community, tempting for exploration. Network analysis and visualization revealed interesting quantitative insight into the high level structure of Timeline entries across the free encyclopedia and its different language versions, inviting to reflect upon the Timeline's content and its underlying categorical structure.

Workshop 1 – The Timeline & The Curated Knowledge Space
Date: November 5th: 14h00 - 18h00

Workshop 2 – Editing the Timeline
Date: November 6th: 13h00 - 18h00

SALÃO PRIMAVERA

Target participants:
Artists, architects, researchers and cultural producers
Number of participants: 15

THE USE OF RPAS (REMOTELY PILOTED AIRCRAFT SYSTEMS) IN THE CONTEXT OF STRUGGLES FOR HOUSING AND HERITAGE PRESERVATION

Júlio Cesar Pedrassoli (professor at EP-UFBA) and Marcel Fantin (professor at IAU-USP);

Monitors:
Augusto César Oyama and Ivan Langone Francioni Coelho (undergraduate students at EESC-USP)

It proposes to offer the participants a general view on aerophotogrammetry and modeling with RPAS (drones), as well as on the possibilities of using this technology in activities of struggle for housing and preservation of cultural heritage. In order to do so, we intend to present the different platforms, sensors and applications in the area of geomatics, including the acquisition of images by aerial surveying, as well as the production of orthophotos, modeling, treatment, analysis and representation of the acquired information.

Content

Historical evolution and state of the art. Different types of drones and their applications. RPAS (drones): from military use to activism. Brazilian legislation regulating the use of these aircraft. The risks of regulation for the construction of social struggles with drones. Potentials and challenges of surveys with RPAS in architecture and urbanism. The different types of sensors and instruments transportable by drones. Aerophotogrammetry: theoretical aspects. Building a flight plan for photogrammetric purposes. Considerations about the topographic support necessary for the georeferencing of cartographic products and their quality control. Realization of an aerobhotogrammetric survey: field class. Treatment of data and images with some of the most used photogrammetric programs in projects based on RPAS. Modeling: processing and reconstruction of three-dimensional images obtained in the field. Conclusion of practical exercises. Feedback: the insertion of RPAS into social struggles.

Method

Lectures and laboratory in computer science and practical demonstrations in field class. The choice and alternation of activities or adoption of methodological alternatives depends on the number of subscribers, the weather conditions and the availability of aero-lifting equipment and information technology.

Dates: November 05th and 06th, 9h00 to 18h00

Duration:12 hours

Target Participants: Architecture and Urbanism undergraduate and graduate students, professors and researchers.Does not require prior knowledge of software

Number of participants:from 08 to 18

CPDIGI - IAU

WIKI-HOUSE: GENERATION AND DIGITAL-MATERIAL CONSTRUCTION

Gonçalo Castro Henriques (professor at LAMO-UFRJ) and Andrés Passaro (professor at LAMO-UFRJ);

Monitors:
David Mendonça and Giordana Pacini (Masters students at LAMO-UFRJ);
Dyego Digiandomenico and Gabriele Landim (Masters students at IAU-USP);

Laboratory Technician: José Renato Dibo (IAU-USP)

It aims to introduce participants to the digital-full-text project through the Algorithmic Design Tutorial, accompanying the preparation, fabrication and assembly of a full-scale web-frames / frameset of a Wiki-House. The workshop is framed in a technical and cultural capacity, and aims to overcome the digital gap in the design process, in architecture, relative to other industries such as shipbuilding, automobile and aerospace, where digital integration is a reality.

Content

Visual programming training and project development in groups. Cutting and assembly of structures in scale. Assembly, by all participants and staff, of structures in scale 1-1 cut previously.

Method

Theoretical-practical method with inclusion of the integrated CAAD-CAE-CAM design process, in all phases. Compact method of teaching through practice, with explanatory results and scientific dissemination.

Dates: November 05th and 06th, 9h00 to 18h00

Duration: 12 hours

Target Participants: Undergraduate and graduate students, professors and researchers

Number of participants: Between 15 and 20

MODELS LAB - IAU

ANALOG PRODUCTION OF PARAMETRIC BRICKS

gt2P and João Marcos de Almeida Lopes (professor at IAU-USP)

consultant: Bruno Damineli (professor at IAU-USP)

Monitors:
Paula Ramos Pacheco and Anna Laura Rossi (Masters students at IAU-USP)

It aims to design an analog parametric device for creating perforated bricks performing Bernoulli effect. The participants will understand empirically about the material and also about a parametric analog production device.

Participants will:

1) design new parametric analog devices,

2) produce models in drywall plaster and

3) test the components.

Dates: November 05th and 06th, 9h00 to 18h00

Target Participants: Undergraduate and graduate students, professors and researchers

Number of participants: Between 15 and 20

LCC LAB - IAU

MAKING MACHINES: ASSEMBLING A 3D PRINTER OPEN SOURCE

Anibal Pereira Jr (AJ3D Printer)

Monitor: Tássia Borges Vasconselos (Master student at IAU-USP)

It intends to enhance the use of 3D printing technology through open source thinking; to expand the understanding of Fused Filament Fabrication (FFF) 3D printing and assembly of a printer through open source thinking; to contribute to the understanding of 3D printing applications in Architecture.

Content

3D printing technologies. Open source printers. FFF 3D printing technology. Materials. Overview and step by step of assembling a 3D printing in FFF. Frame assembly. Electronic assembly. Installation of software. Calibration of the printer. Procedures for 3D printing. Printing in practice.

Method: Theoretical-practical method

Dates: November 05th and 06th, 9h00 to 18h00

Target Participants: Interested in general

Number of participants: Between 10 and 15

NEC RESEATCH GROUP ROOM - IAU

ARCHICAD

Natália Borges and Mairon Magrini (Graphisoft)

Monitor: Mateus Segnini Tiberti (Master student at IAU-USP)

BIM, a process that, among many advantages, increases assertiveness and reduces incompatibilities in architectural projects, is being increasingly widespread and requested by large companies and governments. Knowing how to use the tools involved in this process is an essential requirement for the professional who wants to keep up to date. ArchiCAD is a software developed to assist the professional in the design process and facilitate the extraction of information and documentation. It is intended to demonstrate, in a practical way, the use of ArchiCAD for the modeling, documentation and extraction of information from architectural projects.

Content
Presentation of ArchiCAD; Development of architectural design of a building; Development of project documentation; Quantitative extraction; Publications (BIMx).

Method
Demonstrative classes of use of the software and assistance for the practical application of the students.

Dates: November 6th, 9h00 to 18h00

Required equipment: 01 Notebook per person

Number of participants: 20

Target Audience: Students and Professionals graduated in Architecture and Urbanism, Civil Engineering or related areas. Basic knowledge of building designs is recommended.

PÓS 01 ROOM - IAU

PhD WORKSHOP

Jorge Caron Room

November 6th, 11h00 to 18h30

PhD WORKSHOP COMMITTEE

Gabriela Celani – Universidade Estatual de Campinas – Brazil (President)
Ana Cuperschmid – Universidade Estadual de Campinas – Brazil
Frederico Braida – Universidade Federal de Juiz de Fora – Brazil
Rodrigo Martin-Iglesias – Universidad de Buenos Aires – Argentina
Simone Vizioli – Universidade de São Paulo – Brazi

The resources of stereoscopic 3D language incorporated into the audiovisual language in the digital age

Marlene Nascimento da Silva
FADU- UBA- Universidad de Buenos Aires | Argentina | marlenenascimento.nascimento@gmail.com

Adviser: Marcela Negro

Geometry rationalization and constructibility in the parametric design process

Verner Max Liger de Mello Monteiro
Universidade Federal do Rio Grande do Norte | Brazil | vernermonteiro@yahoo.com.br

Adviser: Maísa Fernandes Dutra Veloso

The Designing of Design Problems: Technologies of perception for discussion

Guilherme Nunes de Vasconcelos
NPGAU/Universidade Federal de Minas Gerais | Brazil | guilherme@guiv.com.br

Adviser: Roberto Eustaáquio dos Santos

Adaptive, Interactive Exploration of Urban Space Design

Seong-Ki Lee
Technical University of Munich | Germany | seongki.lee@tum.de

Adviser: Frank Petzold

BIM as a management methodology of design-construction interface in AEC

Aline Valverde Arrotéia
Universidade de São Paulo | Brazil | aline.arroteia@usp.br

Adviser: Silvio Burrattino Melhado

Digital Production Script for Architectural Space

Igor Lacroix
Universidade de Brasília | Brazil | igorlacroix@gmail.com

Adviser: Neander Furtado Silva

Intelligent Life Cycle Analysis during building use and maintenance

Natália Nakamura Barros
Universidade Estadual de Campinas | Brazil | natalianakamura.arq@gmail.com

Adviser: Regina Coeli Ruschel

Appropriating the design process to new means of production: An application proposal for engineered wood

Caio Magalhães Castriotto
Universidade Estadual de Campinas | Brazil | caio.castriotto@gmail.com

Adviser: Gabriela Celani

Wearable Technology: Healthcare Product Design for Participation of Tetraplegics in Society

Anelise Ventura
Universidade de São Paulo | Brazil | aneliseventura@usp.br

Adviser: Alberto Cliquet Junior

Modeling City as Complex Adaptive System: Activities, Spaciallity and City Emergence

Daniel Lenz Costa Lima
PROURB/Universidade Federal do Rio de Janeiro | Brasil | daniel.lenzcl@gmail.com

Adviser: Denise Pinheiro Machado

GUIDE

Area: 1.136,907 Km²
Average annual temperature: 9ºC a 29ºC

São Carlos is located 230 km from the City of São Paulo. Founded in 1857, its history is marked by the cultivation of coffee. The historic farms located in the rural area are witnesses from that period.

The city presented an early vocation for education and technological research. In 1953 a campus from the University of São Paulo (USP) was received and in 1970 the Federal University of São Carlos (UFSCar) was installed. These public institutions of education and research were followed by the University Center UNICEP (1972) and Embrapa (1984), a renowned agricultural research center.

Today there are about 25 thousand students, including undergraduate and graduate students, in a city of 245 thousand inhabitants.

In addition to research in university centers, a high-tech industrial pole was developed, which gave the city the titles of “Capital of Knowledge” and “Capital of Technology”.

TRAVEL & ACCOMMODATION

DISTANCES FROM AIRPORTS

Guarulhos International Airport / São Paulo 256km
Viracopos International Airport / Campinas 157km
Dr. Leite Lopes State Airport / Ribeirão Preto 107km

TRANSFERS TO SÃO CARLOS

For a better convenience of the conference participants, roundtrip transfers between Airports (GRU / São Paulo and Viracopos / Campinas) and São Carlos could be made by Infinita Transportes, by flexible hours and cheaper prices than the bus lines + taxis, demanding fewer hours to arrive in São Carlos.

If you are interested, please contact Mr. Jânio by janioassis14@gmail.com or +55 16 997810469 (WhatsApp) informing your arrival time at the respective airport as your departure time from São Carlos.

PRICES (ROUND-TRIP)

GRU-São Carlos: US$ 60 (estimated travel time: between 3h30m and 4h)
Viracopos-São Carlos: US$ 40 (estimated travel time: between 1h30m and 2h)
Estimated travel time: between 3h30m and 4h

HOTELS

São Carlos Othon Suites (300m / 4min walk)
Address: 77 Conselheiro Joao Alfredo Street, São Carlos, CEP: 13561-110
saocarlos@othon.com.br

The Hill Residence (3,6km / 8min by car)
Address: 321 Salomão Dibbo Street, São Carlos – SP, Zip Code: 13565-085 Telephone: +55 (16) 3413-9100

Ibis São Carlos (3,7km / 9min by car)
Address: 140 Passeio dos Ipês Street, Parque Faber, São Carlos – SP, Zip Code: 13561-385 Telephone: +55 (16) 2106-6500

Indaiá Hotel Residence (850m / 11 min walk)
Address: 782 Jacinto Favoretto Street, Jardim Lutfalla, São Carlos – SP, Zip Code: 13560-515 Telephone: +55 (16) 3373-7575

SERVICES

São Carlos has the UBER service
https://www.uber.com/

TÁXI SERVICE in São Carlos
Coopertaxi 0800 708 0000 / (16) 3415 6005
http://www.coopertaxisc.com.br/
UseTaxi 3307 7000 / (16) 99163-6263
http://usetaxisc.com.br/

Emergency
Police: 190
Ambulance (SAMU): 192

RESTAURANTS

1. Picanha da Tábua ○
2. Curinga ○
3. La Salutte ○
4. Padaria Guanabara ◑
5. Casa do Café ◑
6. Cantina Barone ◑
7. Kalil Cozinha Árabe ◑
8. Don Corleone
9. Mosaico ◑ ◑
10. Pizzaria Amici ●
11. Frei Damião ○
12. Kamzu Cookie Shop ◑
13. La Villa ◑
14. Mamãe Natureza ○
15. Hamburgueria São Carlos ◑
16. Josephine e Louise Cafe Bistro ○
17. Pé na Praça ◑
18. Maison XV Café e Bistrô ◑
19. Café 7 ◑
20. Blackbird pub ●

○ day ◑ day and night ● night

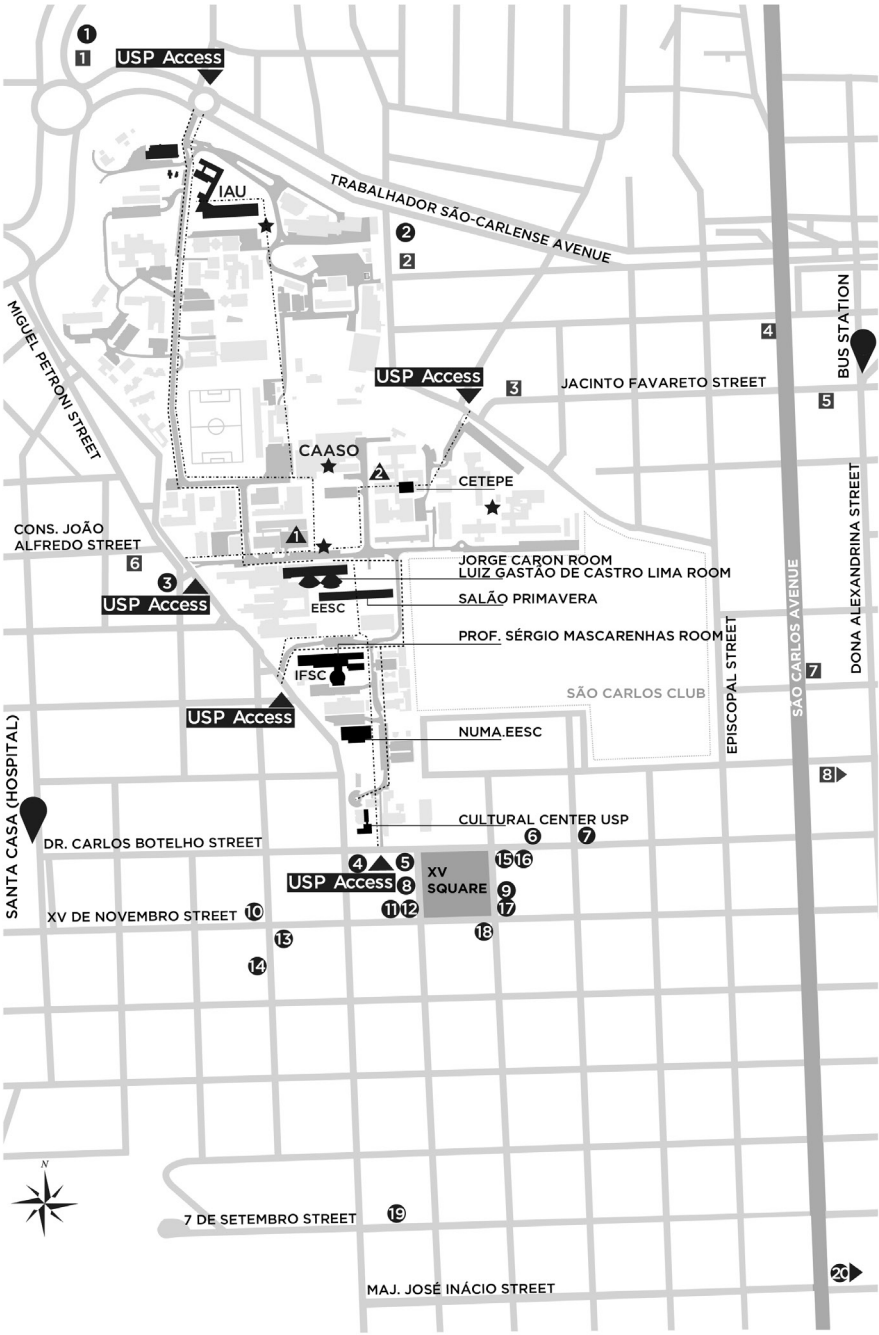
HOTELS

1. Central Park Hotel
2. Atlantis Inn Residence
3. Indaiá Hotel
4. Parisi Hotel São Carlos
5. Indaiá Hotel Residence
6. Hotel São Carlos Othon Suítes
7. Quality Hotel Anacã
8. San Ciro Apart Hotel

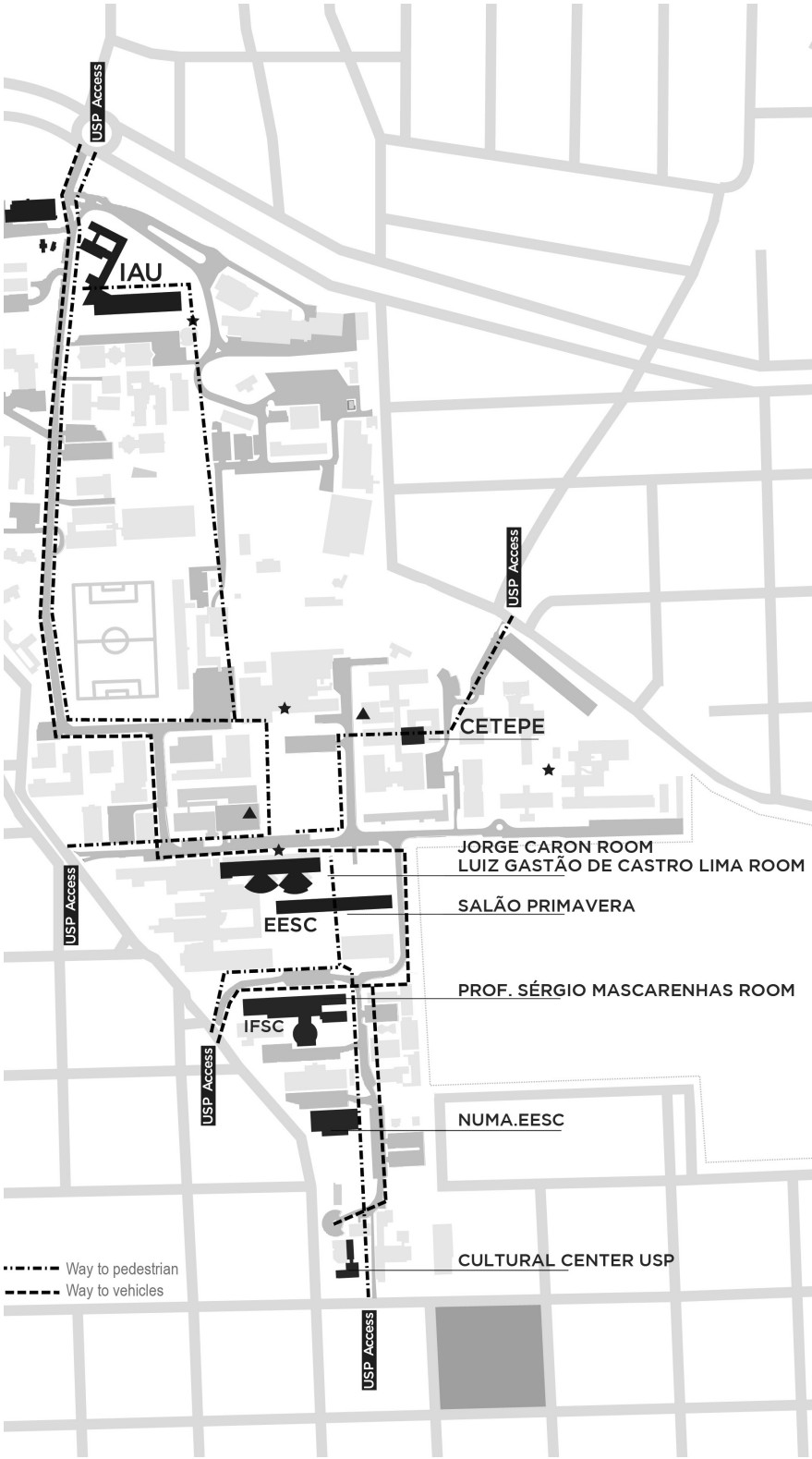
REFERENCES - CAMPUS

- Instituto de Arq. e Urbanismo (IAU)
- Instituto de Física (IFSC)
- Escola de Engenharia (EESC)
- CETEPE
- 1 Santander
- 2 Banco do Brasil
- ★ SNACK BAR
- Way to pedestrian
- Way to vehicles

TO SEE MORE



SÃO CARLOS MAP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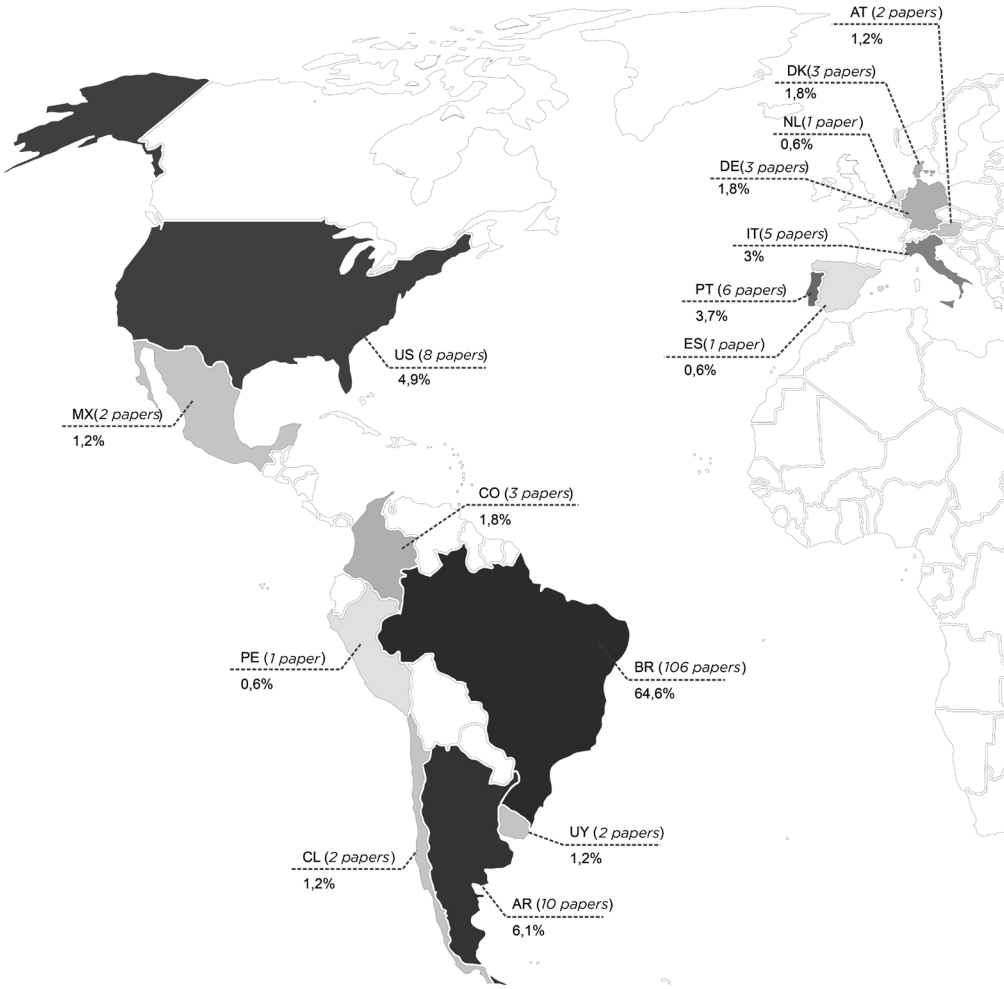
CAMPUS MAP


AT (2 papers)
1,2%
DK(3 papers)
1,8%
NL(1 paper)
0,6%
DE(3 papers)
1,8%
IT(5 papers)
3%
PT (6 papers)
3,7%
ES(1 paper)
0,6%
US (8 papers)
4,9%
MX(2 papers)
1,2%
CO (3 papers)
1,8%
PE (1 paper)
0,6%
BR (106 papers)
64,6%
UY (2 papers)
1,2%
CL (2 papers)
1,2%
AR (10 papers)
6,1%

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SÃO CARLOS
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REALIZATION

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SIGraDi
SOCIEDAD IBEROAMERICANA DE GRÁFICA DIGITAL

SIGRADI2018
TECHNOPOLITICAS

XXII CONGRESSO INTERNACIONAL DA SOCIEDADE IBEROAMERICANA DE GRÁFICA DIGITAL
XXII CONFERENCIA INTERNACIONAL DE LA SOCIEDAD IBEROAMERICANA DE GRÁFICA DIGITAL
XXII INTERNATIONAL CONFERENCE OF THE IBEROAMERICAN SOCIETY OF DIGITAL GRAPHICS

NOVEMBER 7-9, 2018
SÃO CARLOS – BRAZIL

NOVEMBRO 2018

USP SIGraDi

PROGRAM AND ABSTRACTS BOOK

XXII CONGRESSO DA SOCIEDADE IBEROAMERICANA DE GRÁFICA DIGITAL

22th CONFERENCE OF THE IBEROAMERICAN SOCIETY OF DIGITAL GRAPHICS

ABSTRACTS