HOMO FABER

2.0

POLITICS OF DIGITAL IN LATIN AMERICA

RODRIGO SCHEEREN
PABLO C. HERRERA
DAVID M. SPERLING
EDITORS

HOMO FABER

2.0

POLITICS OF DIGITAL IN LATIN AMERICA

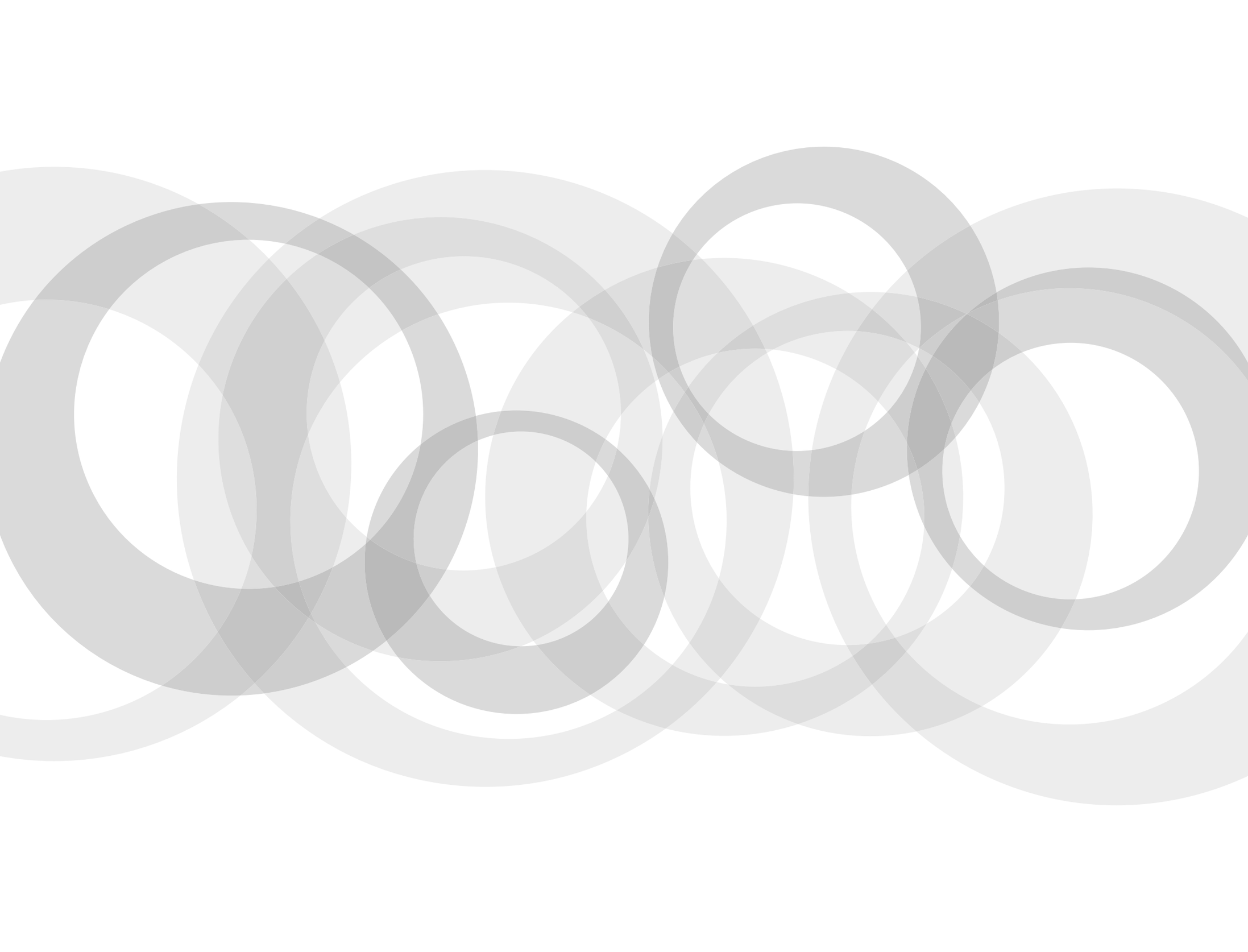
RODRIGO SCHEEREN
PABLO C. HERRERA
DAVID M. SPERLING

EDITORS

SÃO CARLOS

INSTITUTO DE ARQUITETURA E URBANISMO

2018



CONTENTS

9 Homo Faber 2.0:
A political approach on the current state of production in Latin America

COLLABORATIVE PROCESSES + TECHNOLOGICAL SUBVERSION

18 [CIPIT LAB] Maker, Tinker, Learn
20 [NIMBU] Interactive Electronic Modules
22 [LEAUD] ArchBricks Building Blocks
24 [NÓ.LAB] Responsive Object in the Teaching Process
26 [ESTUDIO GUTO REQUENA] Mapped Empathy
28 [LAMO 3D] Tornado, Ruled Surface Pavilion
30 [ONION LAB] Helix Sculpture
32 [LABORATÓRIO PARA OUTROS URBANISMOS] 3D Error
34 [FAB LAB LIVRE SP] Accessible Utensils
36 [PRONTO 3D] Design, Fabricate, Assemble and Transport
38 [ACONCAGUA FABLAB] Convivencial Technological Action
40 [FAB LAB VERITAS] Kölbi Mobile Fab Lab + Mini Fab Labs

CONCEPTUAL PROTOTYPES + TECHNOLOGICAL PRODUCTS

46 [TAMACO] Furetsu
48 [LAPAC] Funicular Shells
50 [DOMVS] Computational Resources, Design Processes
52 [FAB LAB MONTEREY] Bichos
54 [OPEN BRAIN] Attractors and Voronoi
56 [GP ARTE, DESIGN E MÍDIAS DIGITAIS] Form(a)ctivity II
58 [FORMS] Coastal Fog Tower
60 [DUM DUM LAB] Discrete Structures
62 [MORFOLAB] Bio-Inspired Parametric Surfaces
64 [NEXUS] Leaf Brick
66 [IEHU] Curved Folding
68 [EDRO] 360º Furniture
70 [FABHAUS UC] Knot #
72 [LM+P] Northeast House 1.0
74 [UTFSM] XIII Architecture Competition Madera21
76 [TU TALLER DESIGN] Maker Home
78 [SUBDV] Lounge for Brazilian Venture Capital Firm
80 [DESSIN TECHNISCH] Viajes Rosario Boutique Travel Agency
82 [FRONTIS 3D] General Facade, Square 85 Project

ARTISANAL-DIGITAL + CULTURAL ARTIFACTS

88 [FABLAB UNIPILOTO] Artisanal-Digital Tile Fabrication
90 [FAB LAB MAYA] Craftswoman Lab
92 [FAB LAB UNI] Pedal Loom 1.0 + Loom for Blind People 2.0
94 [LED] Modeling as Memory of Vernacular Artifacts
96 [+IDLAB] Alada
98 [LABFAB MVD] Dieste Pavilion

100 Map of cities and countries in the exhibition
104 Information about laboratories

HOMO FABER 2.0
A POLITICAL APPROACH ON THE CURRENT STATE OF PRODUCTION IN LATIN AMERICA

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.

After an inaugural period in the headquarters of the Associação Escola da Cidade in São Paulo, between 7 and 31 July of 2015, the exhibition moved to the Museu Exploratório de Ciências of UNICAMP, then to the Institute of Advanced Studies of the USP in São Carlos, and finally to the Convention Center of the UFSC. In 2018, a special selection of Homo Faber took part of the “Digital Craft in Semi-peripheral Nations” exhibition organized by the Association for Computer Aided Design in Architecture (ACADIA), opened in Mexico City.

Homo Faber 1.0 was designed, including a catalog, an audiovisual repository on the web and a set of digital fabricated objects using various digital programming and

manufacturing technologies under the inspiration of architects, designers, students and professors of architecture schools. Some recurrent categories of uses were identified in the set of projects: Prototyping of small objects, Fabrication of architectural models, Architectural components, Construction models and Fabrication of machines. Seven recurrent applications were also identified from the analysis of processes and results, mentioning those from highest to lowest use: Design prototypes, Models of Architectural Heritage, Pedagogical objects, Components for the construction industry, Objects for impaired people, Objects/processes for development of communities, Models for Art and Museology and Machine Invention. This exhibition became an important milestone by identifying architecture as one of the professions that assumed new design processes and a dynamic role in uses of innovative digital tools in the academy: from 3D printing, the most used technology, to the first explorations in the region using robots in architecture.

In the context of the XXII Congress of the Iberoamerican Society of Digital Graphics (SIGraDi/ São Carlos, Brazil - November 7th to 9th) 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. Treré and Barranquero (2018, p.50-51) explained that technopolitics in Latin America emerged in the second decade of the 21st century, although research throughout the history of technological artifacts or Studies in Science and Technology (STS) has been developed for more than thirty years.

Since the second decade of the 21st century, digital fabrication has been part of the political discourse in various areas and was based on the "make almost anything" model that Neil Gershenfeld promotes in the MIT's Center of Bits and Atoms. To this is added the political initiative of the "mass making" of Chinese Prime Minister Li Keqiang (Lindtner, 2015, p.8) that incorporates Gershenfeld's vision of the mass scale. In 2016, Shenzhen was already known as the cradle maker when the FAB12 was organized. Under this political protection and considering that the term Fab Lab has the reach of a social movement (Walter-Herrmann, 2016, p.38), Lindtner and Avle (2017) showed how "political leaders took advantage of the promises of digital fabrication, pressuring citizens to become self-entrepreneurs and collectively innovators" (p.12).

Likewise in a technocracy where technical teams lead or mark the line of a government, Lindtner and Avle also argue that politicians are linked to technologies to project their global leadership, promote techno-scientific networks and mitigate some problems such as employment (p.1). These policies cease to be discourses when they are promoted by public innovation laboratories, within, by and for the government, as sustained by Freundt (Coordinator of the Laboratory of Creativity and Innovation from PROMPERU and supervised by the Ministry of Foreign Trade and Tourism) and El-Dardity (Director of the Giza Systems Education Foundation, under the supervision of the Egyptian Ministry of Social Solidarity) in FAB14 (2018). The academic experience has the potential to contribute to government initiatives, as is happening in Brazil, or through the government investment projects that financed machinery and agendas that impact the community, as in Chile. 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.

Winner (1980: p.121) argues that "no idea is more provocative in controversies about technology and society than the notion that technical things have political qualities". Technology, in its different forms, determines and defines conventions and imitations of modes of production, of the tasks and the work that shapes society. As Winner said before (1977: p.2), "in one way or another, technology has been a central theme in political thought for the past two hundred years". In the case of architecture, Picon (2014: viii) argues, based on Bruno Latour's definition of politics (2004 [2000]), that digital fabrication appears as a political issue because it regulates the relationships between men and their actions. However, even politicians fail to direct a sustainable connection between initiatives powered by technology and their intentions to serve the community.

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.

Homo Faber 2.0 also takes technology and politics as a reflection in Latin America of the consolidation of new technologies in the architectural production since the second decade of the 21st century - as Gabriela Celani (2016) also pointed out when she reviewed some case studies that were shown in the first exhibition. Although the academy in the region promotes explorations with emerging technology, its progress is the result of the policy of those countries that have the most economic resources and research funding to make it sustainable in universities and architecture studios (Sperling, Herrera, Scheeren, 2015). However, the dialogue between politics and technology is not only about science and technology investments, but about choices in uses of technologies and their assimilation, themes and cultural characteristics of the work, knowledge produced and people involved. As Montaner and Muxi (2011) argues, this happens "because politics is always a discovery, and because the first political decision - in any activity of theory, history, and criticism of art and architecture - lies in what is visible and what is ignored, what is promoted and what is hidden, what is said and what is silenced and who is silenced".

For Homo Faber 2.0, the organizing committee selected 37 projects from a total of 61 proposals. They were distributed into 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 accordance with their location, the initiatives are distributed in nine countries in South and Central America, with the following number of projects per country: Argentina (3), Brazil (16), Chile (5), Colombia (4), Costa Rica (1), El Salvador (1), Mexico (2), Peru (4) and Uruguay (1). Similarly, as in the 2015 version, the laboratories are mainly located in universities, with private funding or from the state. The political context was a determining factor over the last years, strengthening the momentum of researchers who returned to the region after their masters or doctorates and who in many cases currently advise local postgraduate students, motivating them in the approach to digital fabrication. Therefore, many of the projects presented belong to a local generation that integrates new technologies into their proposals, establishing sustainability policies in the process. Along with the visit of specialists and the participation in international congresses, a favorable ecosystem is still framed for the results that are shown in this exhibition.

On the other hand, the case of the academy is different from professional cases. The architecture offices that integrate new technologies were formed by initiatives of architects with specialties obtained outside the region, especially in the northern hemisphere, with a self-managed investment in digital fabrication equipment, and that still doesn't have a sustainable model for maintenance and equipment renewal, as in many of the universities. In some cases, the members of the offices explore experimental methods and proposals with programming and manufacturing techniques, providing workshops in universities in which they also use the academic infrastructure. In contrast to 2015, 8 architecture offices from Brazil, Chile, Colombia and Peru were presented to this exhibition. This is mainly the context of the professional and academic practice of digital fabrication in Latin America. Until 2015, the laboratories centralized their initiatives in their own universities. In the case of the architecture offices, they developed the mobility of their projects to the construction sites where the installations took place. In this version, four laboratories decentralized and moved their teams using mobile fab labs to communities outside their city and even outside their region.

Although Álvarez, González, and Puentes (2013) argue that "a critical point of the Fab Lab is its lack of reflection and innovation on the process of real building construction, which turns them into a simple workshop to learn a tool of representation". 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.

After three years, laboratories in Latin America show a significant advance not only in the diversity of their infrastructure but extends their influence to more countries in our region. Although the growth of fab labs in the world between 2015 and 2018 was of 134%, in South America it remains at 8% (Herrera, Montezuma, Juárez, 2018, p.62).

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.

CURATORS

RODRIGO SCHEEREN
USP- Universidade de São Paulo, Brazil
PABLO C. HERRERA
UPC – Universidad Peruana de Ciencias Aplicadas, Peru
DAVID M. SPERLING
USP – Universidade de São Paulo, Brazil

REFERENCES

Alvarez, N. & Gonzaléz, F. (2016). Política y Fabricación Digital. Una discusión en curso. Sevilla: Vivok Works.

Álvarez, N., González, F. & Puentes, M. (2013). Contextualizando lo digital. Reflexiones del Taller Politics of Fabrication Laboratory de la Architectural Association y la Universidad Católica de Valparaíso. Revista 180, 32, pp. 30-35.

Celani, G. (2016). Changing the architectural production chain in Latin America with the introduction of new technologies. Materia Arquitectura #13 pp. 118-121.

Herrera, P. C., Montezuma, V., & Juárez, B. (2018). Crafts in Latin America: The contribution of the Fab Labs in the promotion of resilient communities. In Proceedings from the Fab14 + Fabricating Resilience Research Papers Stream (pp. 57–64). Rotterdam: Rotterdam University of Applied Sciences. http://doi.org/10.5281/zenodo.1344443

Lindtner, S. (2015). Hacking with Chinese Characteristics: The promise of the Maker Movement against China´s Manufacturing Culture. Science, Technology, & Humans Values, 40(5) pp. 1-26.

Lindtner, S. & Avle, S. (2017). Tinkering with Governance: Technopolitics and the Economization of Citizenship. Proceedings of the ACM on Human-Computer Interaction, Volume 1, Issue CSCW, Article No. 70. Retrieved from https://doi.org/10.1145/3134705

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

Picon, A. (2014). Foreword. In Caneparo, L. (Ed.). pp. v-viii. Digital Fabrication in Architecture, Engineering and Construction. New York: Springer.

Sperling, D. & Herrera, P.C. (2015). Homo Faber. Digital Fabrication in Latin America. São Carlos, Brazil: Instituto de Arquitetura e Urbanismo de São Carlos.

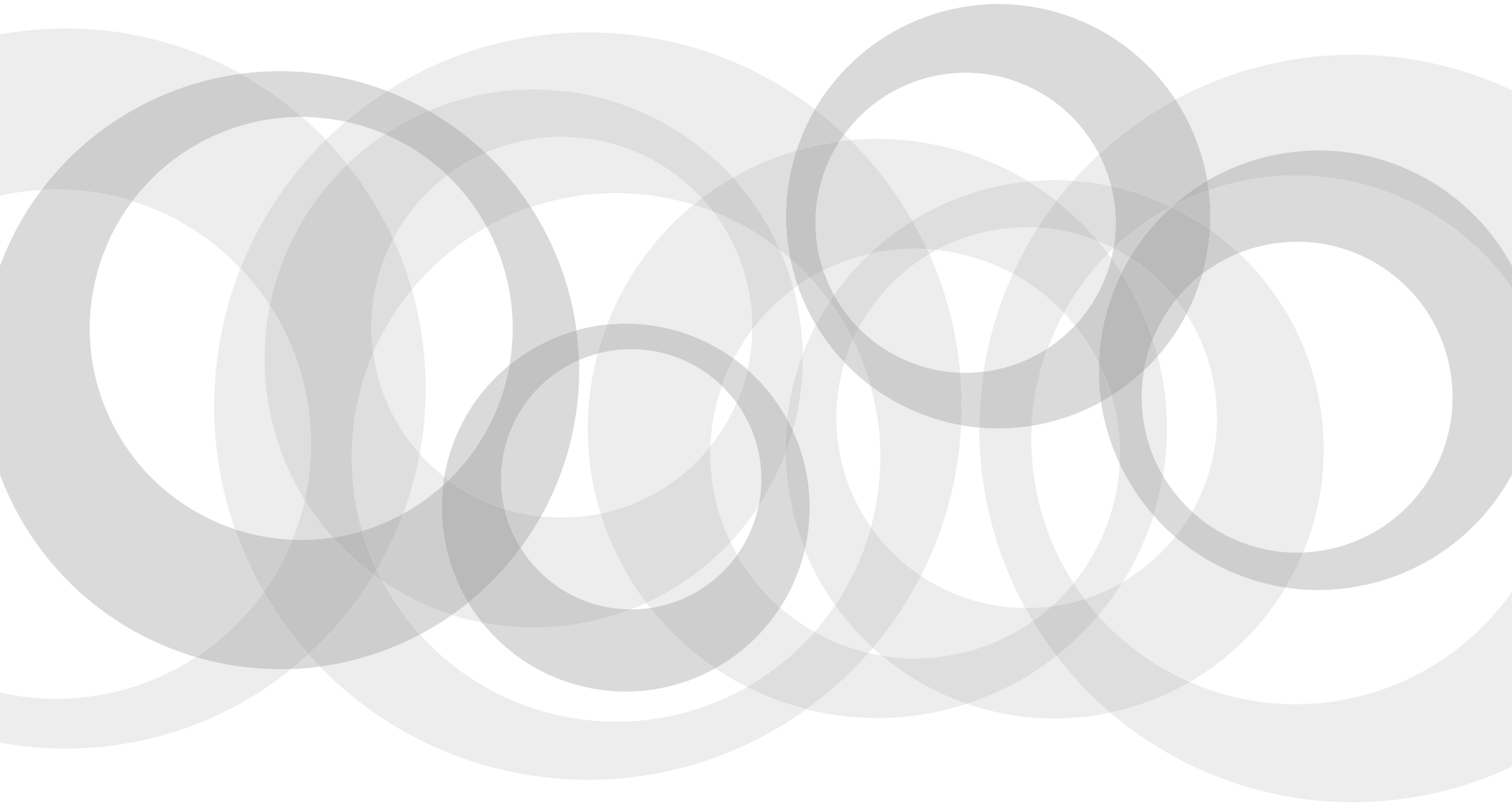
Sperling, D., Herrera, P.C. & Scheeren, R. (2015). Migratory Movements of Homo Faber: Mapping Fab Labs in Latin America. In: Celani G., Sperling D., Franco J. (Eds) Computer-Aided Architectural Design Futures. The Next City - New Technologies and the Future of the Built Environment. CAAD Futures 2015. Communications in Computer and Information Science, vol 527. (pp. 405-421. Berlin: Springer. https://doi.org/10.1007/978-3-662-47386-3_22)

Treré, E. & Barranquero, A. (2018). Tracing the Roots of Technopolitics: Towards a North—South Dialogue. In F. S. Caballero & T. Gravante (Eds.), Networks, Movements and Technopolitics in Latin America. Critical Analysis and Current Challenges (pp. 43-63). Cham, Switzerland: Palgrave Macmillan.

Walter-Herrmann, J. (2013). FabLabs – A Global Social Movement. In J. Walter-Herrman & C. Büching (Eds.), FabLabs of Machines, Makers and Inventors (pp. 33-45). Wetzlar: Majuskel Medienproduktion GmbH.

Winner, L. (1977). Autonomous Technology: Technics-out-of-Control as a Theme in Political Thought. Cambridge, MA.: MIT Press.

Winner, L. (1980). Do Artifacts have Politics?. Daedalus, Modern Technology. Problem or Opportunity 109(1) pp. 121-136.



The presentation texts of the projects are a responsibility of the respective laboratories.

1

COLLABORATIVE PROCESSES + TECHNOLOGICAL SUBVERSION

MAKER TINKER LEARN

CIPIT LAB

EL SALVADOR

Maker Tinker Learn is a series of workshops carried out by researchers in El Salvador and the United States through a series of interactive educational activities for children of ages 7-11 in three countries of Mesoamerica with the support of fab labs of El Salvador, Guatemala and Mexico. They explored three different areas:

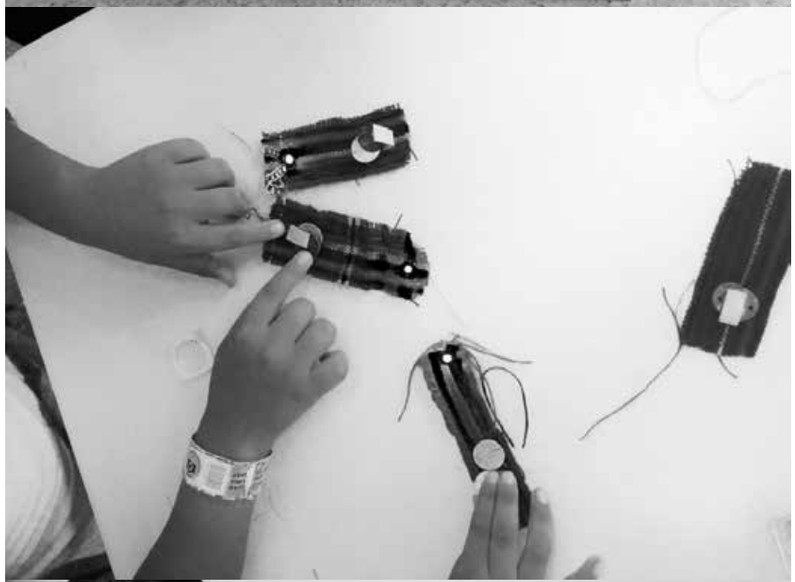
1. A constructionist approach of learning by doing applied to both artisan work and maker culture, focusing on the respect to local artisan technology. Children were guided into problem solving by being exposed to practices of maker culture, crafts and the shared set of skills necessary for both activities.

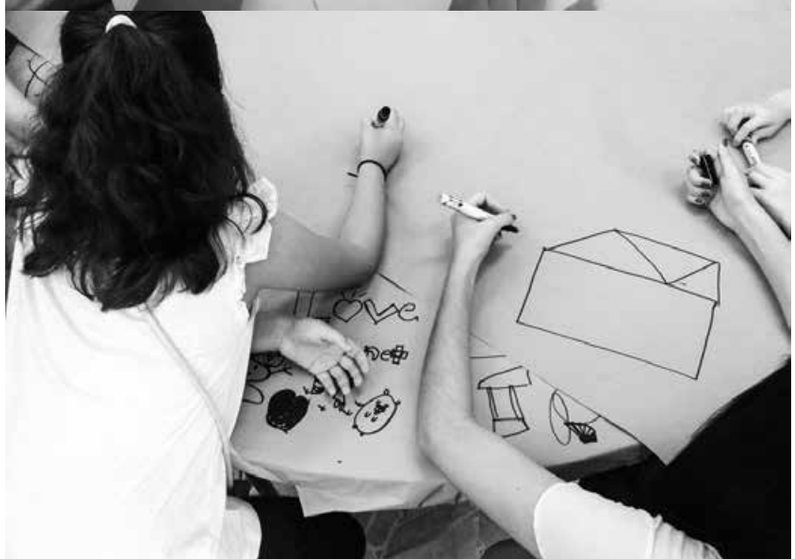
2. Material feminism and the deconstruction of group hierarchies through exchanges with local textile artisans, with whom children learned by observing and taking part of local fabrication processes. Children learned about artisans and their problem-solving techniques. The artisans also had the chance to value their work as valid in the digital age.

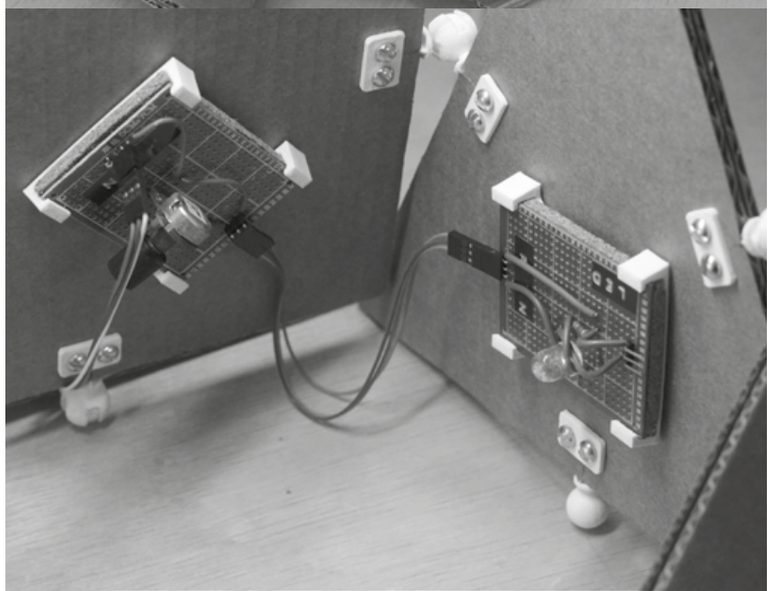
3. Agency development through the design of solutions for environmental problems. This approach brought students closer to local problems in their communities through social empathy, nurturing an appreciation towards their local context, articulated through the use of analog and digital technologies.

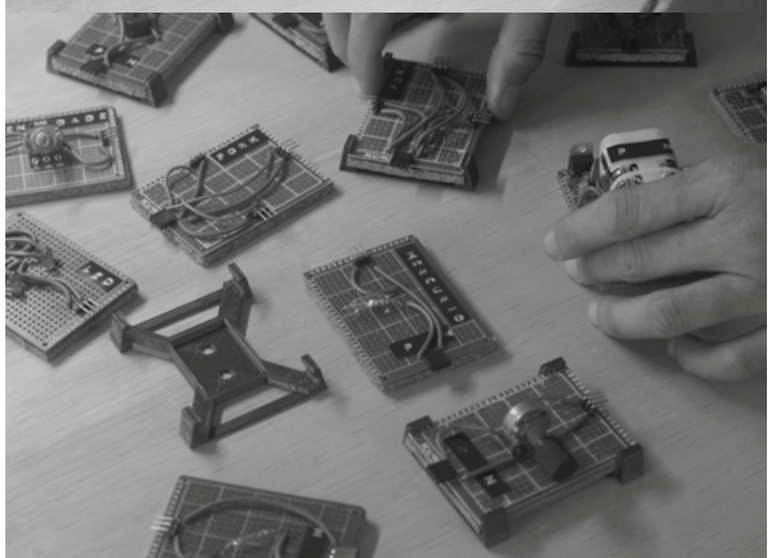
VIDEO

These activities valued the development of circular economy initiatives through maker culture, developing in the process a sense of agency as well as abilities for spatial thinking and problem solving in participants. It was also observed that all participants identified the inherent value of maker culture within their own contexts and skill level, thus promising to be a valuable insight on two fronts of maker culture: the development of more inclusive programs for education, and the need for future makers to explore local practices as a starting point for value generation in local settings.









The Interactive Electronic Modules Project fits into the fields of electronics and interaction design for teaching and experimentation in architecture and design. The project, which has been in development since 2016, provides for the prototyping and construction of a modular electronic parts kit that may also be useful in the early stages of object design and interactive environments.

The purpose of this experiment is, besides the elaboration of an instrument for the learning and exploration of basic concepts in electronics and interaction, the construction of an open and dialogic research process, with a cybernetic matrix.

The modular parts kit was initially prototyped following precepts of educational and commercial kits such as Lectron, Bloc-Tronic and LittleBits, among others, but always seeking a lower cost and the possibility of open source, using accessible and reused materials.

INTERACTIVE ELECTRONIC MODULES

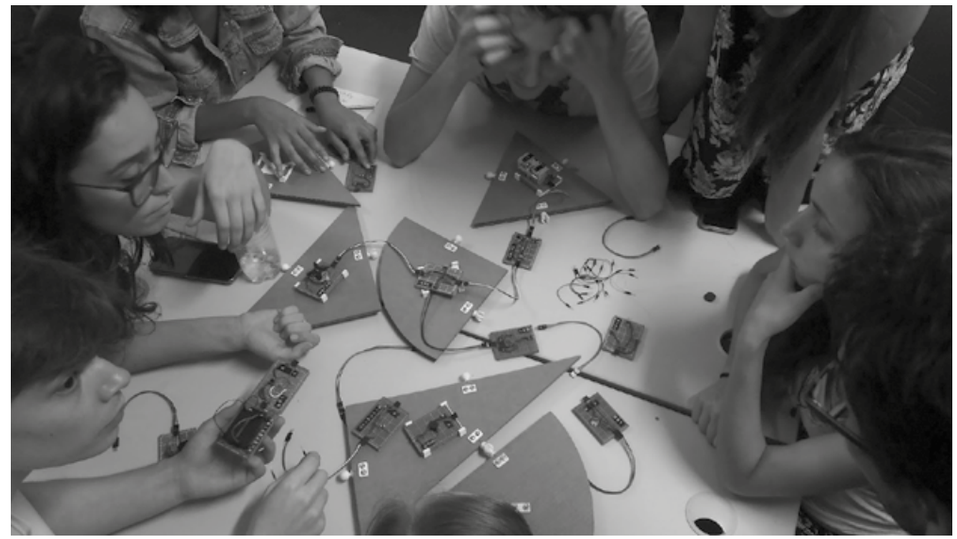
NIMBU

BRAZIL

The research process also includes the conception of several design alternatives so that the modules can adapt to different contexts, including protoboard versions, which can be modified easily, resulting in new modules, PCB soldered versions with digitally manufactured supports that enable the coupling of modules to various surfaces, such as a three-dimensional structure in cardboard similar to the “Bichos” of the Brazilian artist Lygia Clark.

VIDEO

The project has been tested in architecture and design teaching environments and in open workshops as a strategy for bringing architects and designers closer to electronics and interaction design.



ARCHBRICKS BUILDING BLOCKS

LABORATÓRIO DE ESTUDOS DAS LINGUAGENS E EXPRESSÕES DA ARQUITETURA, URBANISMO E DESIGN

BRAZIL

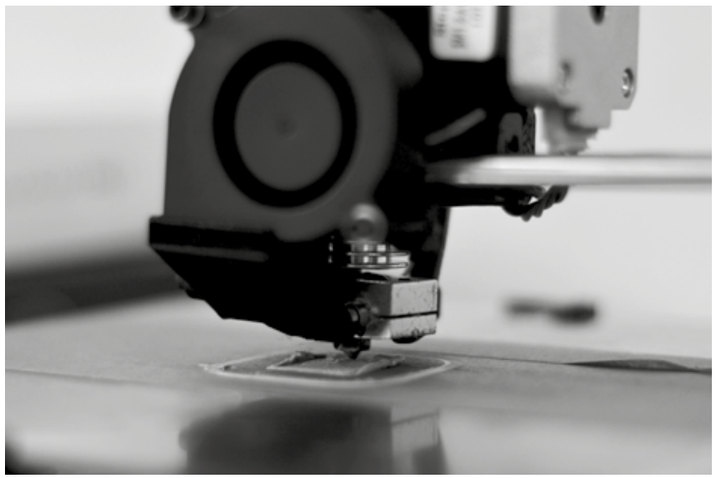
ArchBricks is a set of building blocks, result of a research developed by LEAUD and sponsored by FAPEMIG, Capes, CNPq and UFJF, in which the production and sharing experience of a toy was carried out for didactic use in the academic environment, being inspired by “do-it-yourself” and “open-source” tendencies. Therefore, that research project aims the discussion around the role of maker movement and open-source platforms in the context of contemporary design education.

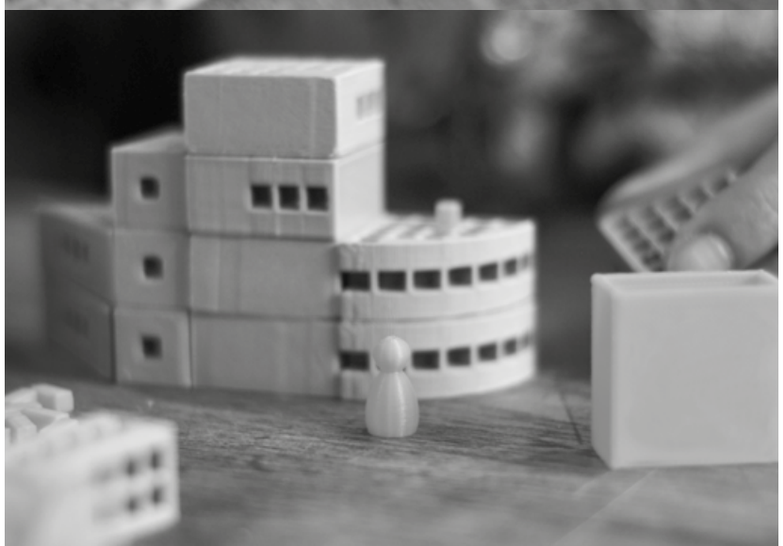
The research project was proposed taking into consideration that we are facing a contemporary movement of universal education: the maker movement, which is based on the empowerment of individuals, especially from the access to the contents available in digital media, in a scenario of democratization of teaching-learning processes.

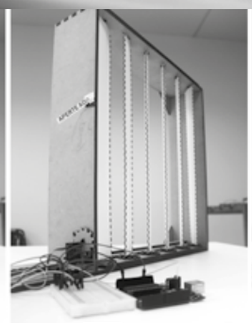
ArchBricks game, mainly related to architecture design of small houses was developed as a didactic tool from digital fabrication techniques and it can be download without any payment. Thus, the game is available on web (https://archbricks.weebly.com/) and it can be downloaded, modified (if necessary) and printed (using 3D printers) for free.

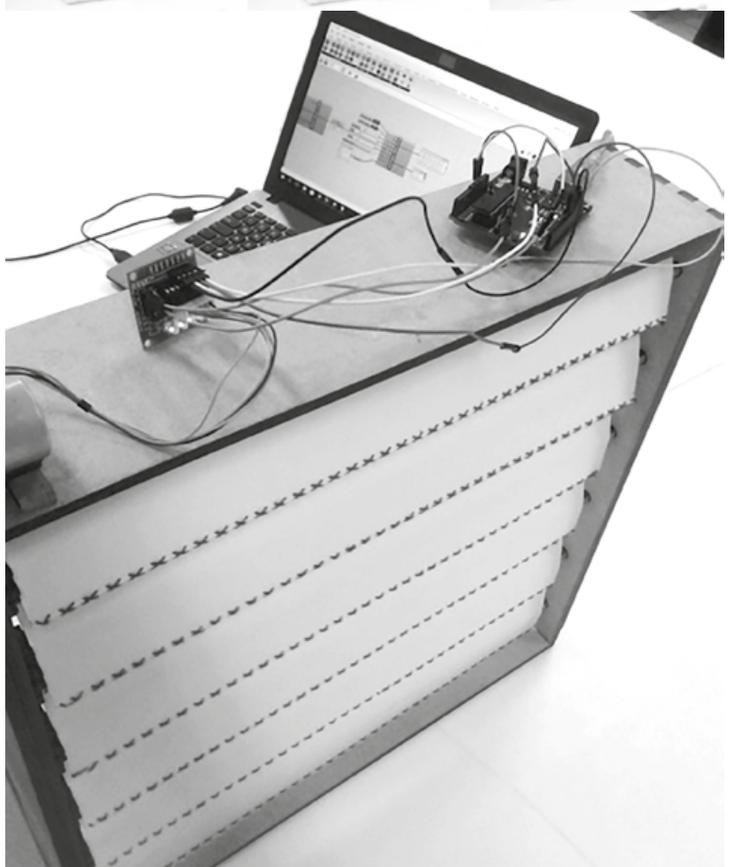
VIDEO

Finally, it should be noted that the reflections arising from the research project and the proposal of the game seek to encourage flexible, collaborative, creative and innovation processes, as well as to contribute to the debate around maker movement incorporation in the scenario of Architecture, Urbanism and Design and some themes inherent to this movement, since the development of research and the game itself activates some themes that are peculiar to them, such as: digital fabrication (3D printing), empowerment of the contemporary homo faber (do-it-yourself), open source universe, as well as free access to information, content and knowledge.









RESPONSIVE OBJECT IN THE TEACHING PROCESS

NÓ.LAB

BRAZIL

The Nó.Lab (DAU/UFV) seeks to integrate the digital design and rapid prototyping tools into didactic activities in order to teach the intrinsic logic of these tools and context.

In a master discipline in 2017/18, the goal was to practice the performance-based design with simulation, optimization, and responsiveness, present in the current architecture theories.

Project # 1: In the semester 2017-II, in a partnership with Latecae Lab, the challenge was to understand performative generative processes through modeling and prototyping brises rotated according to the solar trajectory, simulating photovoltaic panels. Responsiveness was through the prototyping of panels activated by light sensors.

Project # 2: In the semester 2018-I, students with different backgrounds (Architecture, Engineering, and Computing) and professors of the Architecture and Urbanism and Computer Science Courses joined a collaborative teamwork for creating a responsive prototype, called “Dancing Pavilion”, in an open event hosted by UFV FabLab - the “Arduino Day”.

In both experiments, students assembled for programming and modeling in Rhinoceros and Grasshopper, interacted with Arduino-type microcontrollers and grasshopper plugins, such as Firefly, Ladybug, Octopus, Diva, and Honeybee (project # 1), as well as Ultrasonic and Lighting sensors (LDR) for recording user interaction locally or remotely through Wi-Fi NodeMCU module (project # 2). The components were performed in a laser cutting machine in a process of low-tech and high-tech production trials.

VIDEO

These didactic experiences seek to collaborate for critical practices within the new academic curricula of architecture training, where methods and processes of teaching-learning advance towards the collaborative work between teachers of different disciplines and students with different abilities. It also aligns with Maker Culture through praxis and exchanges of skills, breaking with the traditional model of teaching-learning established in the academic environment.

MAPPED EMPATHY

ESTUDIO GUTO REQUENA

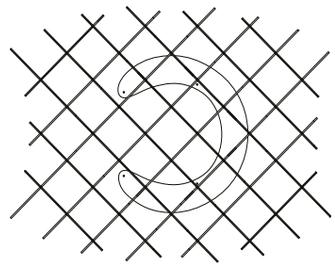
BRAZIL

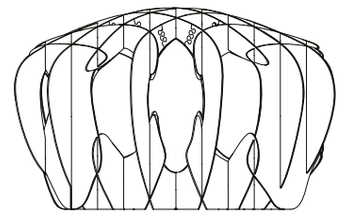
Mapped Empathy is an experimental research project developed in a professional practice environment. It seeks at exploring possibilities of adding new poetic layers into urban furniture through interactive digital technologies. It reflects on the potential of a new era of street furniture with embedded technologies that improve our sense of collective, belonging and memory, empowering communities to build a better society that stimulates empathy.

Mapped Empathy was designed to be open source, copyleft, reproduced anywhere, and then to be improved by the creative community and social entrepreneurs, stimulating digital fabrication, fablabs and a more collaborative production process. It was designed following Universal Design principles, being as intuitive as possible and allowing the same democratic experience for all visitors, regardless of age, ability, physical disabilities or situation. Kids, elders, big or small sized, blind or deaf, on a wheelchair – all are connected through the exact same experience.

VIDEO

Polygonal modeling and parametric design tools were broadly used in the design process, which was driven by the inspiration in temples and meditation spots. The output was a prototype with a fluid morphological language. It was produced by CNC router machinery and its shape resonates that of a cathedral that comfortably houses a small group of people that are unknown to each other. Regarding the interactive system, people's heartbeats were recorded in real time at the touch of a finger via sensors installed on the benches. This vital information was sent to speakers and lights that transformed the architecture into a large sculpture of emotions. Every individual heartbeat can be heard, and then the generative music software gradually mixes and transforms the heartbeats into a symphony driven by the vibrant pulse of life. The lighting system follows the same sensitive rhythm, creating effects that assist in the immersion process.





TORNADO, RULED SURFACE PAVILION

LAMO 3D

BRAZIL

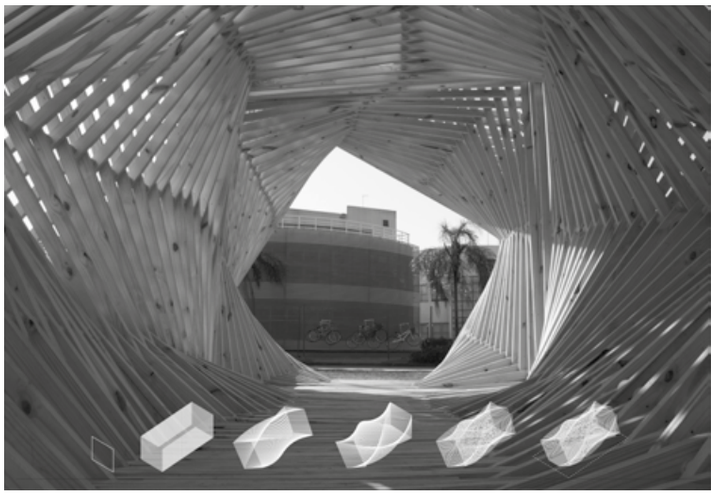
VIDEO

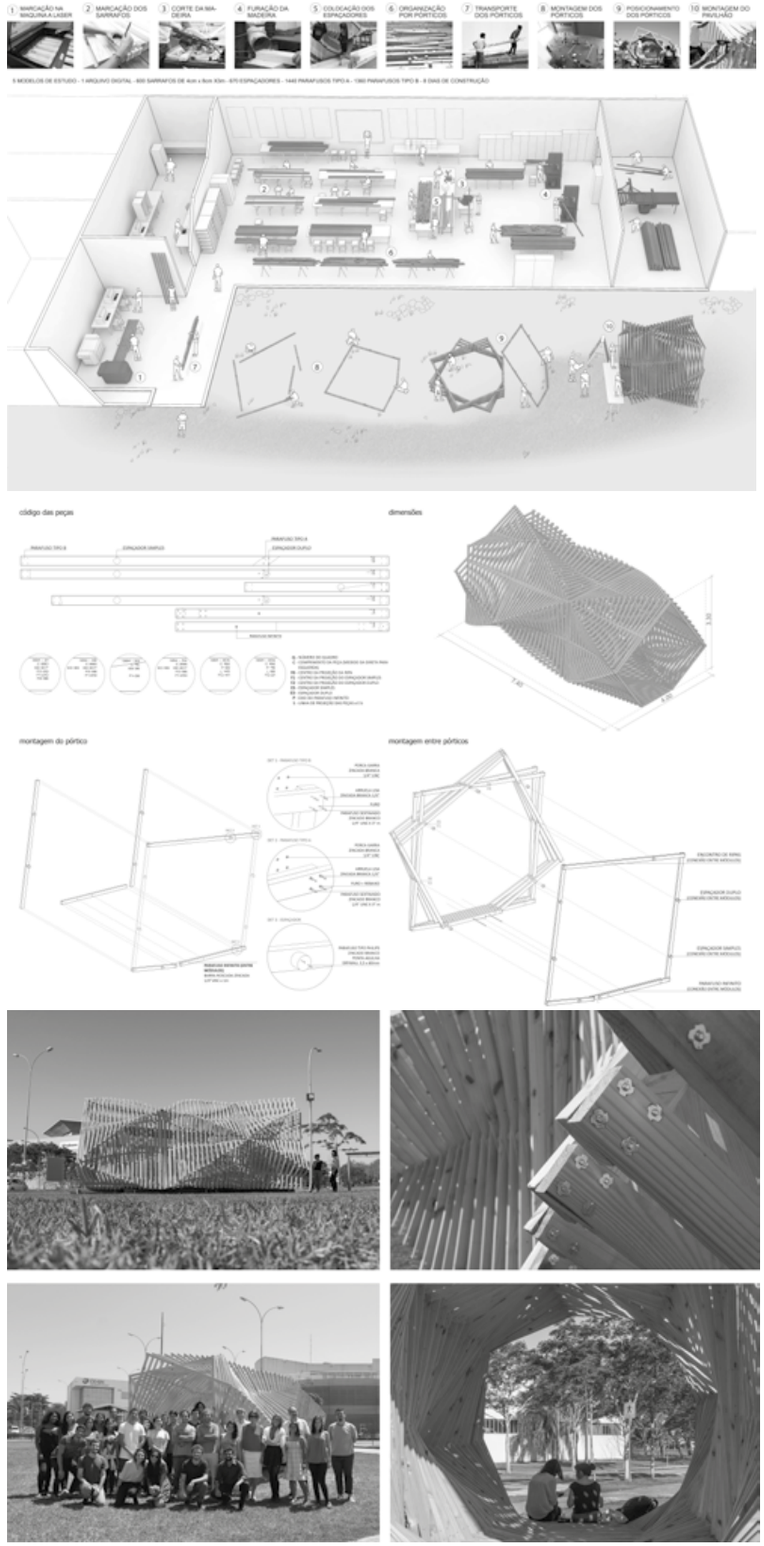
The Tornado Pavilion, inaugurated at the UFRJ Science Park in September 2017, was developed in the elective discipline course “Arquiteturas (in)Úteis: Intervenção Temporária, Geração e Fabricação Digital”, a partnership between FAU / UFRJ and the Faculty of Architecture of University of Lisbon, with the support of the UFRJ Science Park. The discipline was a joint action of two PROURB-FAU / UFRJ laboratories: Laboratory of Temporary Interventions and Tactical Urbanism (LabIT) and Laboratory of Models 3D and Digital Fabrication (LAMO).

The students should articulate the themes temporary Interventions (LabIT) and ruled surfaces (LAMO), aiming the construction of a place of permanence in the Park. A small pavilion intends to attract visitors that cross the campus. The pavilion introduces a new bodily relation with the space, a relation of contemplation to fullfill the absence of outdoor spaces and small equipments. It provides a passage in a geometry that invites visitors to sit and enjoy the shadow and the breeze together with the welcoming natural vegetation of the place.

As a conceptual research process are used the properties of ruled surfaces explored using algorithmic design and digital manufacture, to conceive an unique materiality. The primitives used were pine slabs with 4cm x 7cm with 3 m length. The participants developed 5 different projects and Tornado Pavilion was the selected proposal to build in full-scale. Four slabs form a frame that rotates in a serie in opposite directions with an angular increment of 1,5 degrees. There are 50 frames rotating in one direction and 50 rotating in the opposite direction. Between the frames are placed spacers that allows the entrance of daylight and creates shadows so the visitor can hava a glance in the landscape through a constant rhythm while crossing the interior of this pavilion.

The pavilion is placed in an empty space that has the potential to be a square an to fill the place with strangeness, as an object that attracts attention and creates tensions in the landscape. The structure occupies an inviting location; a place near the entrance of the Park, a bus stop, and visually is connected to the most active areas of the park, offering places to sit and interact.





This project, whose function as well as aesthetics is to give identity to a private company of construction: “Dessau SYZ”. The sculpture had to represent the company and that their work team feels identified with it.

Dessau SYZ builds roads and bridges. They understand the strength and properties of metals and cement. For this reason, Onion Lab decided to work with those materials and find a way to recycle existing ones. Like those found in the great scrap metal of Lima...

And when there is an innumerable amount of elements of the same kind, an order or path must be created for them. A growth methodology. Like guides nature uses. Like the Helicoids.

HELIX SCULPTURE

ONION LAB

PERU

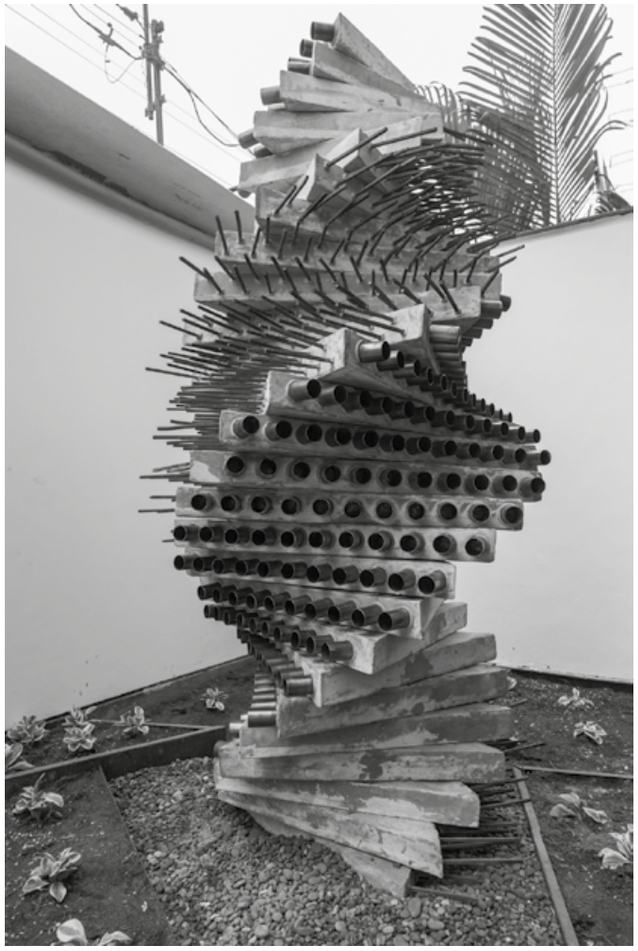
Helicoidal structures are abundant in nature, at the microscopic and at the macroscopic level. The helicoidal form is present in the most recondite of living beings, as in the double helix of DNA that encodes our inheritance. Nature chose this form for its growth and development.

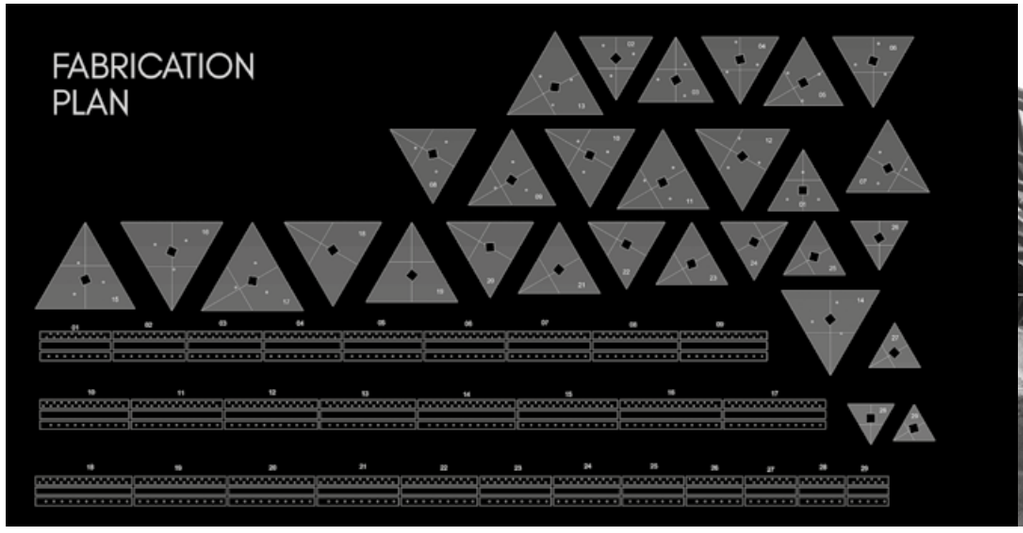
VIDEO

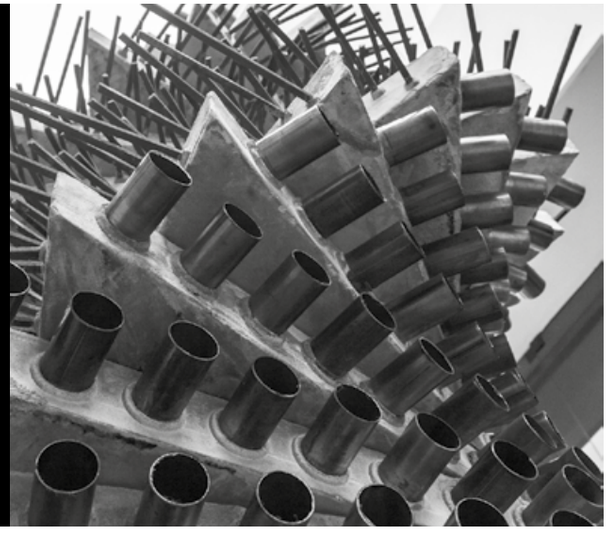
Onion Lab began to organize more than 800 metals collected. 29 triangles of different sizes were created digitally, which rotate in each level to form the triple helix of the sculpture. On each side of the triangles, metals of a type were embedded, either rods or tubes. Each side of the triangles represents one of the three forces of the Company: Consulting, Engineering and Works.

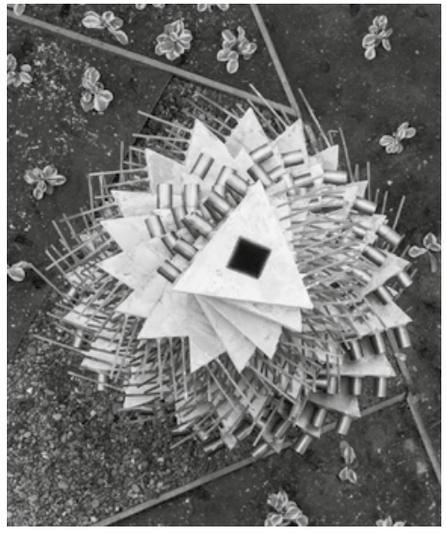
The precision of digital fabrication was required. 116 wooden formwork pieces were built to form the triangles. Each piece of formwork had multiple perforations so that the chosen metals could come to the surface.

In each triangular formwork, cement was emptied, thus leaving the metals embedded in the interior. Finally, with a mini crane each triangle was inserted to a vertical axis cemented to the ground. The result is a helicoidal sculpture almost 3 meters high and 1,5 tons.









The project “3D Error” is a collection of waste, errors, failures, noise, manufactured in 3D printing machines. There are more than 100 pieces collected in laboratories of digital fabrication in S„o Paulo, from 2016 to 2018. The objects are of different typologies, shapes, and colors that had problems in the manufacturing process and discarded for being damaged.

The 3D printing technology is commonly announced as the machine of the new industrial revolution, which will transform the mode of production, distribution, and consumption of objects. However, the 3D printers are subject to errors that make the manufacturing process even slower, causing material waste and increased power consumption. Also, instead of being used for project development, rapid prototyping, exclusive or non-existent parts in the market, there is an underutilization of the 3D printer in the manufacture of souvenirs, replicas of monuments, keyrings, and other similar items.

3D ERROR

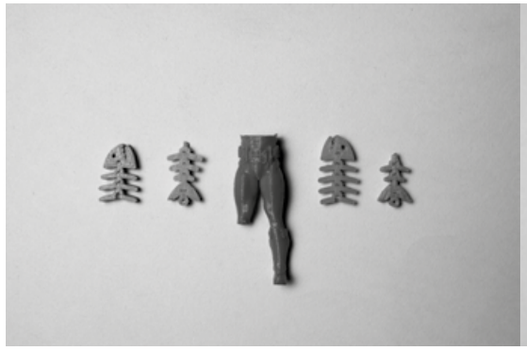
LABORATÓRIO PARA OUTROS URBANISMOS - GRUPO DE PESQUISA ESTÉTICAS DA MEMÓRIA NO SÉCULO 21

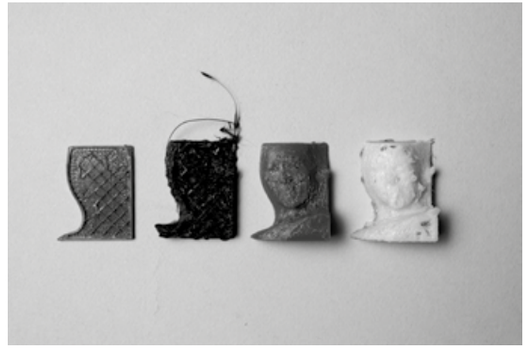
BRAZIL

VIDEO

The problems of layer detachment, warping by material contraction, nozzle clogging, poor filaments, among others, produce the ruins of the industrial revolution. The abandoned pieces are traces of the new factory and reveal the weaknesses of digital technologies. Contemporary society is deeply dependent on computational devices and consequently on the failures of digital communication technology. Problems with plugins, security errors, corrupted files, access failures, glitches, paper jam, lack of connection, and so many other errors belong to the informational ecosystem. Moreover, part of these problems come from accelerated technological development itself, which makes previous versions obsolete.

In this sense, the “3D Errar” collection proposes a critical view at the technology of digital fabrication, with an aesthetic perspective in the observation of the noises, highlighting the incomplete layers, the infill structure, image deformation, reproduction failure of monuments, fragmented bodies. In the digital sphere, “what you see” is not always “what you get.”





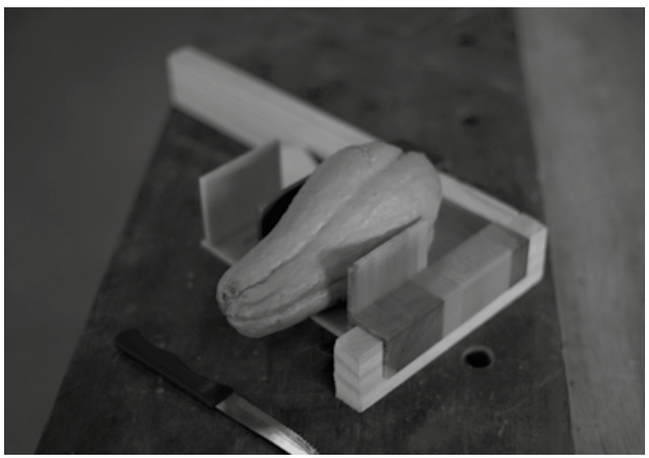
ACCESSIBLE UTENSILS

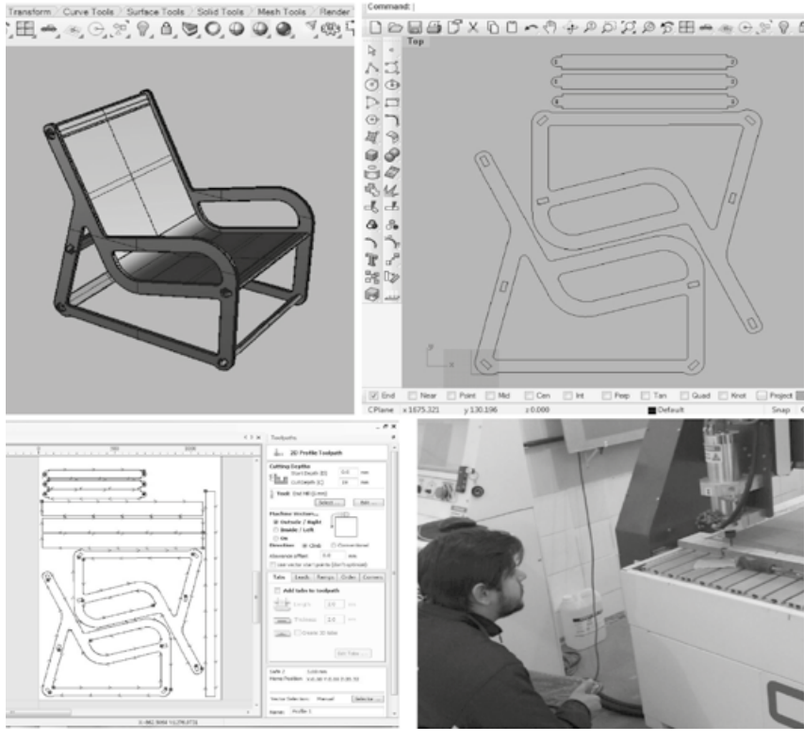
FAB LAB LIVRE SP
CEU TRÊS PONTES

BRAZIL

VIDEO

This type of utensils can help handicapped people in the transition and rehabilitation phases at the daily activities. The cake holder has been developed through the Free CAD 2D and 3D (free software) and is composed by five pieces of insert that form the complete utensil. The prototype was printed on PLA filaments through a 3D Printer. The prototyping process, including study, development and printing, lasted approximately 20 hours, with 8 hours in workshops about the new software presented, and the last hours was invested in definition of the structural design and printing each piece. Therefore, 64 studies of different forms/types were developed, calculating the weight and balance, resulting in a universal model of the utensil. Also developed through 3D printing, the food board is a utensil that consists of four pieces that when fitted form the complete object. Among the pieces, one serves as the basis for food and the others serve to hold the food in the base or the base in the sink. Depending of the type of sink, for use of the utensil, first you need resize the fitting according to the dimensions of the sink which it's to be used. Currently the designer of this project studies new possibilities of adjustable inserts and another forms.





DESIGN, FABRICATION, ASSEMBLE AND TRANSPORT

PRONTO 3D

BRAZIL

The work presented here is a series of four chairs that aimed important issues in digital fabrication processes: 1) the use of wood as the main material; 2) easy to assemble; 3) no nails, screws or glue in the assembly; and 4) easy to transport. Added to it, as an encouragement on the use of recycled materials as part of the seat and backrest, two of them were configured with secondhand banner canvas and strips of leather from old clothes, using laser-cutting technique. Other interesting part of this work is concerning the applied design processes when technology is involved. All the four design pieces used digital prototyping as a decision maker, with a considered number of small-scale models, in either 3D printing or laser cutting, to understand fitting, ergonomics and make them feasible. The focus of this series of chair projects is the designer significant involvement during the whole process, from design through tests in fabrication and assemble trials, ending in transportation convenience. The practice and training about digital fabrication techniques is primordial to improve knowledge and reach design innovation.

VIDEO

80% of the world's population still remains to be included in technological globalization, the creative class continues to be an exclusive and concentrated community (Florida 2002), the open source software and hardware still do not extend to a broader population, low cost electronic devices and machinery are accessible thanks to e-commerce and personalized distribution, the culture of distributed production requires integration and self-sufficiency needs to be promoted in the face of people's systemic dependenceThe realization of these ideas open up for all of us the opportunity to find joy and balance in the use of machines as "tools for conviavility".

CONVIVENCIAL TECHNOLOGICAL ACTION

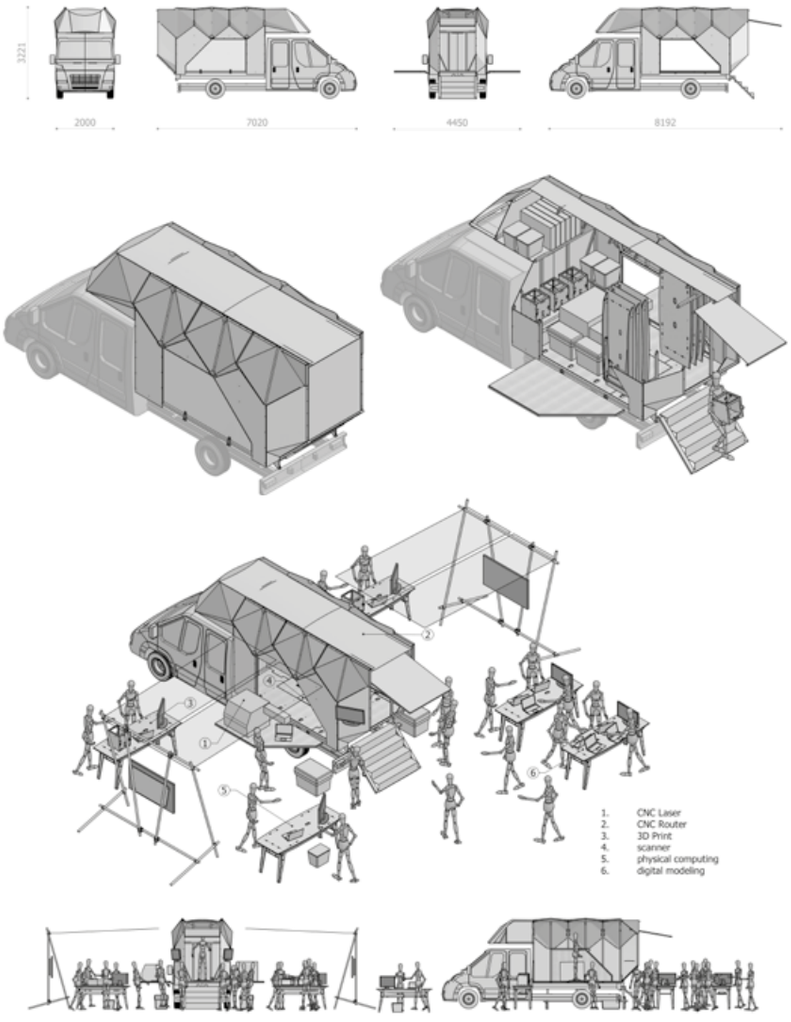
ACONCAGUA FABLAB

CHILE

The purpose of the Aconcagua FabLab is to look for new ways of articulating the millenary triad: humanity-tool-society. In this sense, we have involved hundreds of people of different ages and situations, artisans and schoolchildren, with whom we work in what we refer to as "situated challenges", in which capabilities emerge from a creatively active, open, and shared position; re-creating values for an inventive, collaborative, inclusive, and free society.

VIDEO

Our workshops have promoted the materialization of ideas through the collective use of digital manufacturing technologies. That is, they work on the generation of objects and open production processes where users are involved in their creation, bringing together skills and knowledges in scientific, technological and design fields. The laboratory technologies are applied with the aim of showing their advantages for local productivity, such as on site- on demand manufacturing, which can reduce costs in transportation and infrastructure and prevents over-stocking. Furthermore, such local productivity allows residents to meet the specific and prioritized needs tailored to their local case since it allows dynamic variability of unitary or serial lots, encourages collaborative and transversal work, and helps to unite communities around shared values such as creativity or the materialization of a local cultural and territorial identity. Finally, in the debate between local or global markets, such productivity breaks the barrier between the manufacturer and the user, integrating the creative will of the individual within his community, thereby regenerating social fabrics within professions from the bottom (up) in order to produce an impact from the cultural bases.



We are an itinerant space that hosts activities generated from co-creation processes. In this space you can do “almost anything” and develop your own ideas with machines and digital manufacturing processes such as laser cutters, cnc routers, 3D printers and scanners, electronics and programming. This is a social-technological empowerment workshop where you will be part of the creative industry and thus become a maker.

With the alliance of kölbi and Veritas, we created a Public-private partnership, this is a strategy of action which is becoming very important in recent times, these types of alliances are based on the conviction that, in order to achieve significant results, it is necessary to collaborate with different actors of public administrations, companies private and civil society.

KÖLBI MOBILE FAB LAB + MINI FAB LABS

FAB LAB VERITAS

EL SALVADOR

VIDEO

Whats is the Kölbi Mobile FabLab - Veritas?

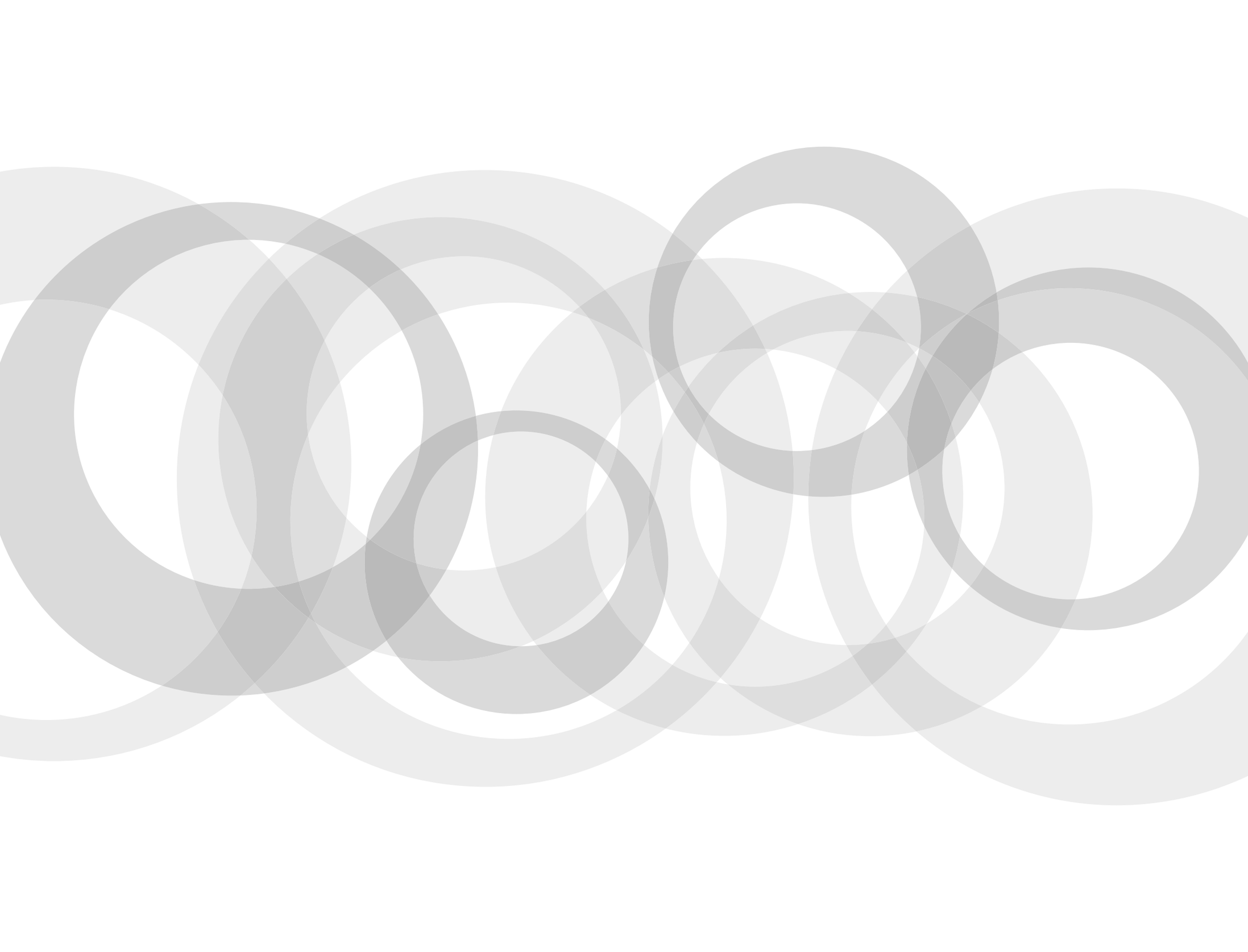
Nomadic space: Traveling and portable space that hosts activities generated from co-creation processes, constituted by a basic laboratory of analog and digital manufacturing. Due to its multi-scale nature, it can be transported by suitcases, trucks, buses, ships, among others, to different parts of the planet.

Inclusive space: Space without borders for its citizens, translated in turn as a social-technological empowerment workshop, which expands and promotes citizens access to technological tools, together with a global community of creators and developers of software and hardware connected through Internet.

Prototyping space: This space has as its main objective, that its participants can do “almost anything” by means of rapid prototyping, materializing any idea using machines and digital manufacturing processes such as: laser cutters, CNC router, 3D printers and scanners, together with electronic processes and programming.

Participatory space: A space that promotes the free participation of all its citizens, generating a sense of belonging, not exclusive, promoter of social cohesion and cultural, artistic and productive interactions as a base for plural, multicultural and living societies.

Resilient space: With the ability to quickly support areas at socioeconomic risk, minimizing the impact and vulnerability of its citizens.



2

CONCEPTUAL PROTOTYPES + TECHNOLOGICAL PRODUCTS

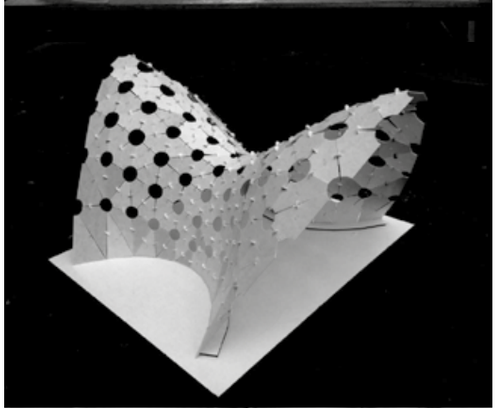
FURETSU

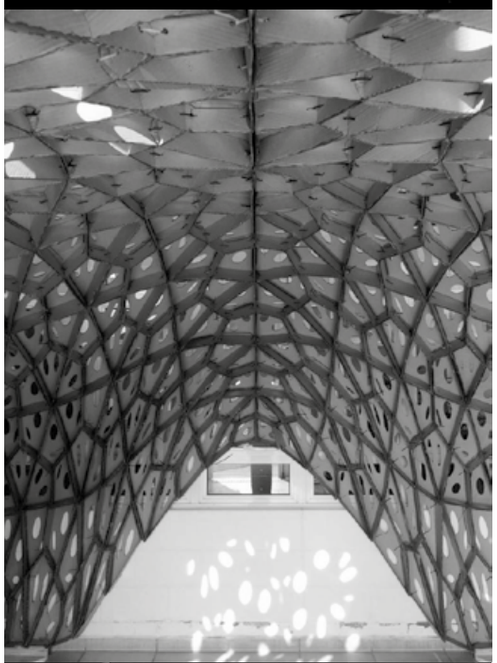
TAMACO

ARGENTINA

FURETSU is a digital designed and fabricated pavilion, which explores the architecturalproperties of an ultra-light material such as corrugated polyethylene. Its curvy “skin” is composed by 672 unique, white, laser cutted pieces, which grouped in four and joined through a male-female system, generates 168 pyramid shape modules. The particular geometry of the modules, interlocked between each others, constitute a special, shell like a stiff structure. Since the union between the modules is made through bolts, the pavillion can be easily assembled and disassembled. The general geometry was designed through digital form-finding process, which allowed to come up against a structurally efficient morphology. Additional structural support is provided by a set of 6mm, CNC milled plywood ribs, which are interposed between the white modules at regular distance. Furetsu is a research project of TaMaCo (Taller de Materiales y Construcción)/ cheLA (Centro Hipermediático Experimental Latinoamericano), presented as part of “TEDx Río de la Plata 2017, Escenario Itinerante”.

VIDEO





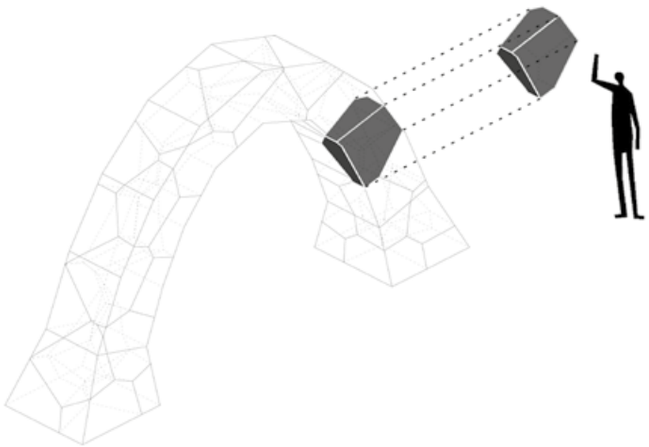
FUNICULAR SHELLS

LABORATÓRIO DE AUTOMAÇÃO E PROTOTIPAGEM PARA ARQUITETURA E CONSTRUÇÃO - LAPAC

BRAZIL

Funicular structures are well known for their efficiency, presenting low material consumption in relation to their footprint. Recently, there has been a growing interest in the study of these structures, especially with the fast development of parametric modeling and digital fabrication. The study of this structural system shows that there are many possibilities of composition of materials and construction systems. At Unicamp, an experiment was carried out on modeling, CNC fabricating and assembling two types of pavilions with a funicular shape. For each of them, a small scale model (1:3) and a full scale prototype were produced. The first pavilion was designed with elements connected to each other by disks placed tambem in orthogonal planes, composing a system of plates with the gridshell forces being transferred through these discs. The parts and the disks were connected through notches. The small scale model of this pavilion was 3D printed in PLA, while the prototype was produced in ACM sheets cut in a CNC router. The second pavilion was designed with quadrangular boxes with fins, where the overall shape consisted of a thin, leaked shell with ribs formed by the joint of the fins. The model of this pavilion was produced with 200g/m≤ density paper, cut in a vinyl cutter, whereas its prototype was made with laser-cut corrugated cardboard. The forms of the two pavilion were digitally generated with form-finding technique, starting from a flat form and resulting in a three-dimensional funicular shell. Next, the shell was subdivided into pieces that make up the system. This geometric model was then used both for the structural behavior analysis and for the digital fabrication. Structural simulations were performed to verify the displacements, susceptibility to buckling and the level of tensions developed. From the same model, the input data for the digital manufacturing devices were prepared. Numbering was inserted in each part to help in the assembly process, since all the pieces are different and thus have unique positions. In the first pavilion the assembly logic was the relation of pairs of parts with their connection disks with concatenated numbers, read from a table. In the second prototype, the numbers were marked on the fin parts during the manufacturing process. Fins of neighboring parts had the same numbering, indicating that they should be together. It was observed, however, that the second-order displacement and the global buckling values of this structure were more critical than the stress limit of the material, and these displacements were higher in regions of less curvature or few support points. The project was developed by Prof. Dr. Felipe Tavares da Silva during his postdoctoral internship at Unicamp, and its production and assembly were carried out at LAPAC, with the collaboration of interns and researchers from the laboratory. The ACM prototype was exhibited as a garden sculpture at the Campinas Decor 2018 exhibition.

VIDEO



COMPUTATIONAL RESOURCES, DESIGN PROCESSES

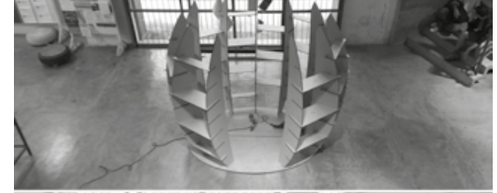
DOMVS - LABORATÓRIO DE INVESTIGAÇÃO EM ARQUITETURA, URBANISMO E PAISAGEM

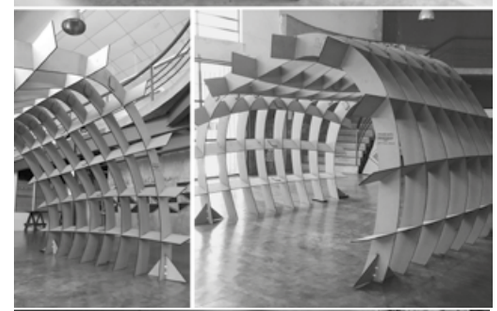
BRAZIL

VIDEO

The "Computational resources, design processes and teaching of architecture and urbanism" research project aims to verify possibilities of intersection between computational resources, design process and teaching of architecture and urbanism. More specifically, this research aims to contribute to a better understanding of: (a) how different computational tools and methods used in the design process can influence the architectural object as a final product; (b) what the state of the art of tools, resources and computational methods in the context of architectural production is; (c) how this theme is being and / or can be incorporated into the teaching of architecture and urbanism.

In this context, this research project presents preliminary results from the elaboration of the following works: (a) a mini-pavilion/model-display ñ a model exhibitor, designed, modeled, manufactured and assembled in a workshop with undergraduate students; (b) Catenary Arch - a catenary shaped arch, made of cardboard and developed as a final work of an undergraduate discipline; (c) Waffle Pavillion - a waffle-shaped MDF pavilion, a result of a master's research.



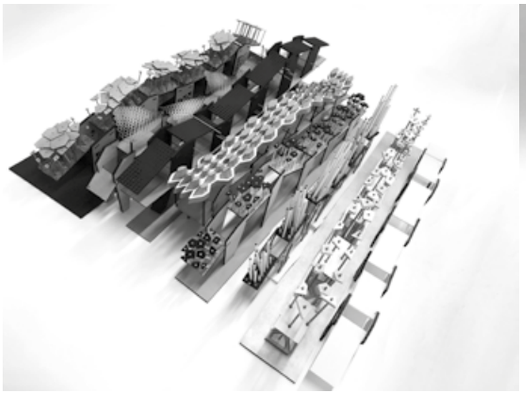


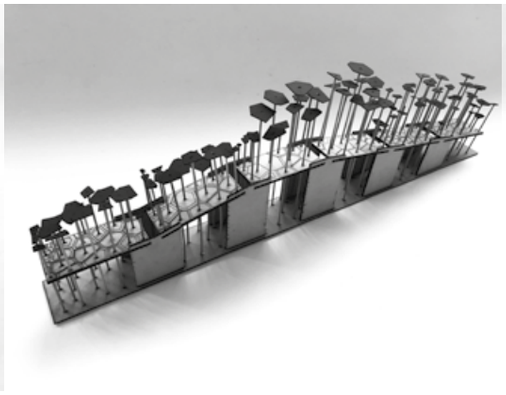
BICHOS

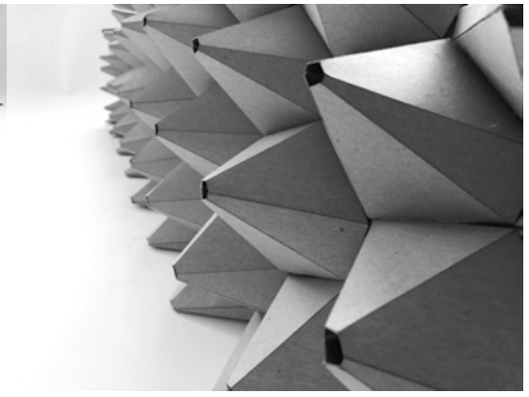
FAB LAB MONTEREY MEXICO

Started in 2013, this work translates into a real scale family of pavilions denominated Bichos which are design and produced between a Studio of Architecture of the UDEM1 and the FabLabMTY. The project comes from the feedback of two axis. At first the role of computational processes of morphogenesis, generative, associative and parametric thinking and the concept of the project as a system. Second, the digital fabrication as the linkage of the object's design, materialization and the designer's dominance of the "making". The work is developed with different approaches:the teaching experience, introducing computational design and fabrication from the first stages of designer's formation; the physical content of the research, on their process of generation through morphological studies that focus on the comprehension of a project as a system with defined elements and internal rules; finally an evolution towards the relation of architecture and context as part of the system. Such investigation is born to materialize complex conformations, showing the possibilities of digital fabrication. However it became a studying methodology composed by analogue and digital form finding, top down and bottom up modalities, parametric-generative design, associative and algorithmically processes and digital fabrication. Exploration of materials are also included such as the potential of wood, the formal-plastic properties of concrete as well as the addition of sensors and other electronic devices, allowing the object to not only have a shape and a particular use but to interact with the user. All this contributes to the formation of new designers, who are expected to generate more and better knowledge and content as well as having a deeper domain over new technologies that can synthetize as a bigger consciousness over our present.

VIDEO







ATTRACTORS AND VORONOI

OPEN BRAIN UPC

PERU

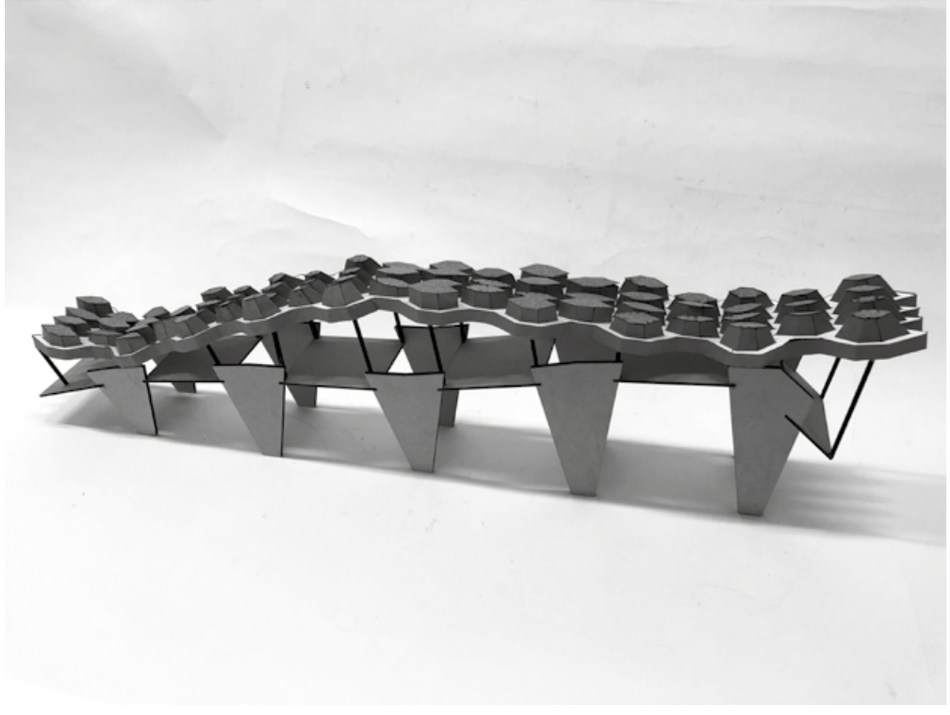
VIDEO

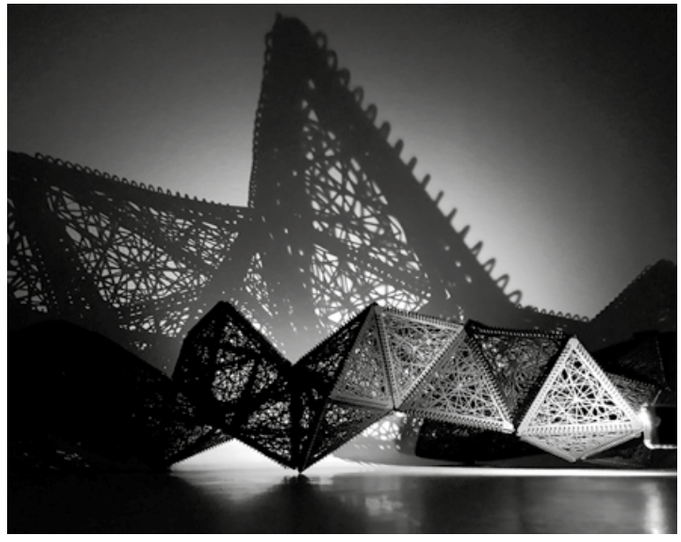
This class is developed in a computer lab and is aimed at using and understanding the parametric tools applied to three-dimensional geometries that can be applied to a space or object. At the end of the course, the student handles different programs applied to the design in a conscious way in its limits and its applied logic.

This exercise is called “Attractors and Voronoi” and seeks that the student understands the concept of the attractor as geometries (point, curve or solid) towards which it is attracted by a system (in this case of geometries) and Voronoi as a method of interpolation for the fragmentation of a surface.

Aimed at second year students who were given a rectangular and regular surface on the X and Y axes and irregular Z axis and had as a brief attack this surface with both concepts: attractors and Voronoi, creating a composition without defining a function or scale.

A requirement of the exercise is that this composition in 3 dimensions is possible in its manufacture using a laser cutter as a digital tool, which handle the use of software Rhinoncheros 5.0 and Grasshopper and materials such as cardboard, 4 mm MDF, 5 mm foam, link of 90gr paper and wooden rods of square and circular section.



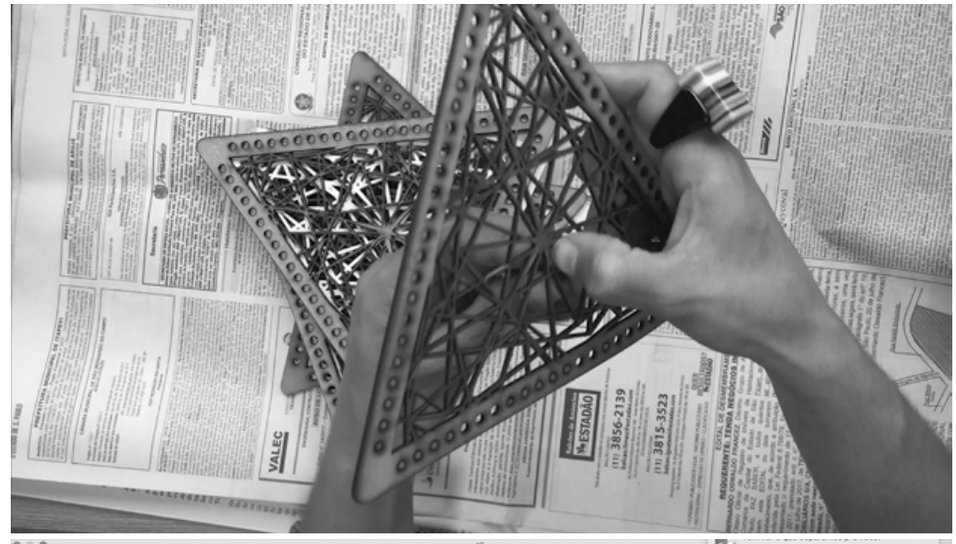


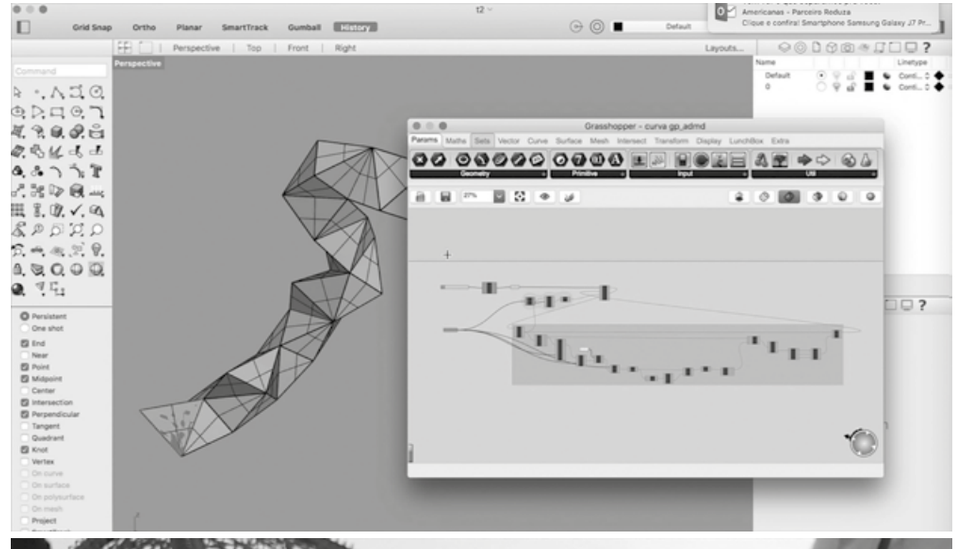
FORM(A)CTIVITY II

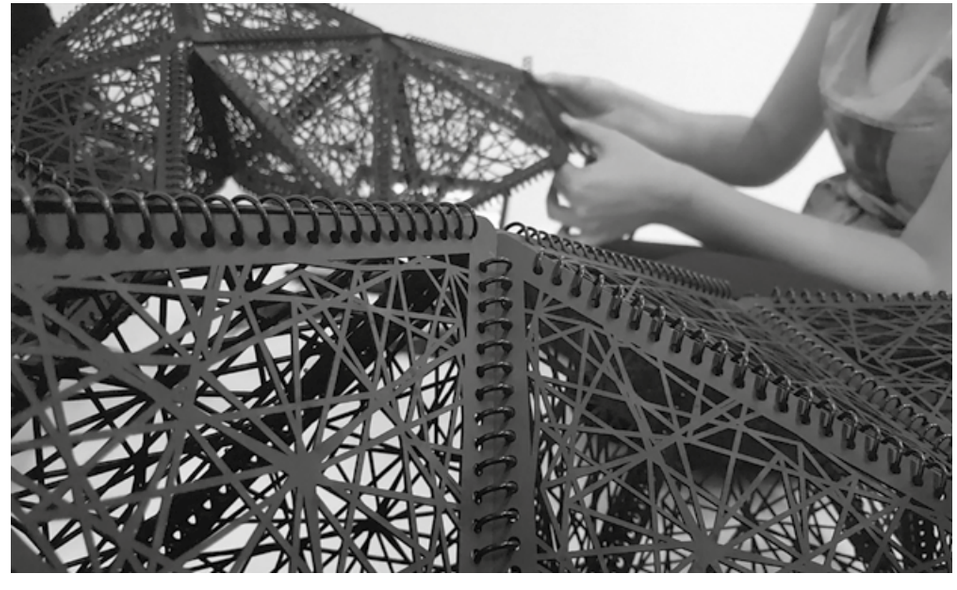
GRUPO DE PESQUISA EM ARTE, DESIGN E MÍDIAS DIGITAIS
BRAZIL

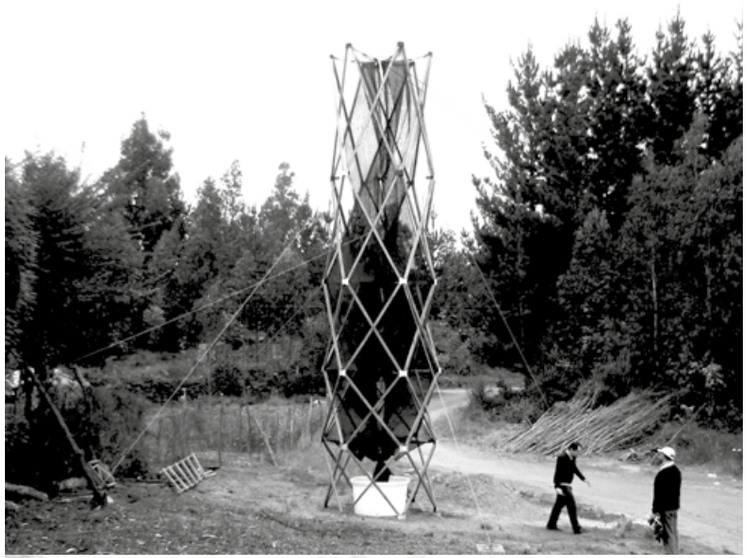
VIDEO

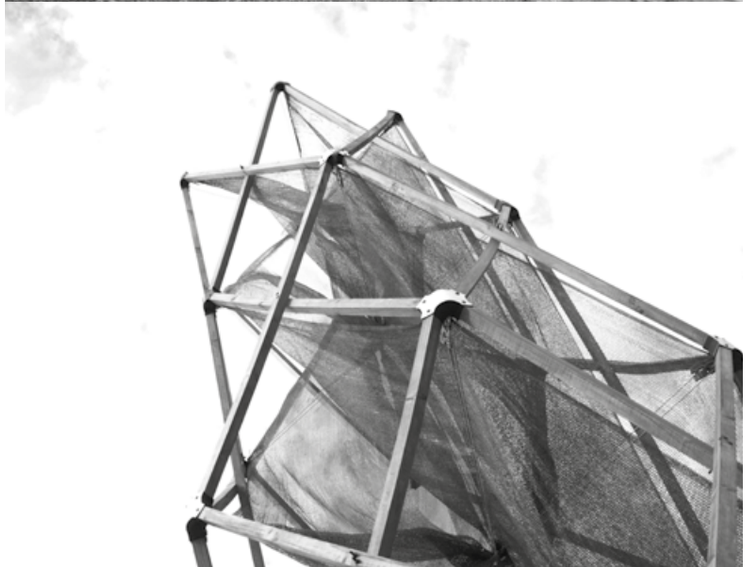
In order to relate art and natural systems, the artwork “Form(a)tividade II” aims to metaphorically simulate the growth of organic systems. Based on translation mechanisms, the authors admit that the notions of iteration and variation support this process of creation. These specific and distinctive qualities of the installation are premises for the establishment of the formal delimitation of the object, which generates a species of living organism. The installation is presented in the format of a modular structure, arranged in a dark room, and generated by the displacement of tetrahedra, which follow a certain guiding line in space. The structural arrangement of the tetrahedral modules and the formal configuration of their faces are the result of digital recursive systems. Both the guiding line of the tetrahedral modules and the lines of the triangular faces simulate the representation of organic forms. The displacement line of the tetrahedral modules was designed by using Rhinoceros 5 and Grasshopper software. The simulated lines of the triangular faces are generated through the local rules programming performed by Processing 2.2.1. Each face of the tetrahedron was generated in a laser-cut machine on 600g black paper. The structure of the tetrahedra was manually assembled, each face being attached to the other by means of plastic spirals. The structure favors contrasts of light and shadow produced in the exhibition environment through the participation of visitors as a way to analogically emphasize possible interrelationships with systems of nature. More specifically, this participation is made through by the use of the flashlight of the mobile phone of each receiver. When this light source is emitted on the modular structure, the formation of shadows occurs. The change in the position of the receiver and, consequently, the displacement of light alter the size and position of the shadows, which may determine the representation of fictitious worlds, suggesting the simulation of spaces, sometimes two-dimensional and sometimes three-dimensional.











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 of water capture versus current systems Horizontals that interfere with the flow of fog in tangential ways. The water availability in our country has declined over the last decade, so innovative solutions are required to take advantage of the unique coastal water potential. Using digital technologies has been possible to develop a highly replicable and adaptable structural solution that can bring an affordable solution for this problem.

We developed a vertical capture system based on medium height towers (from 10 to 20 mts.) catching water for human use from the existing coastal fog as well as the optimisation of rainwater capture in most of the central and northern coastline of our country in about two thousand miles of territory.

VIDEO

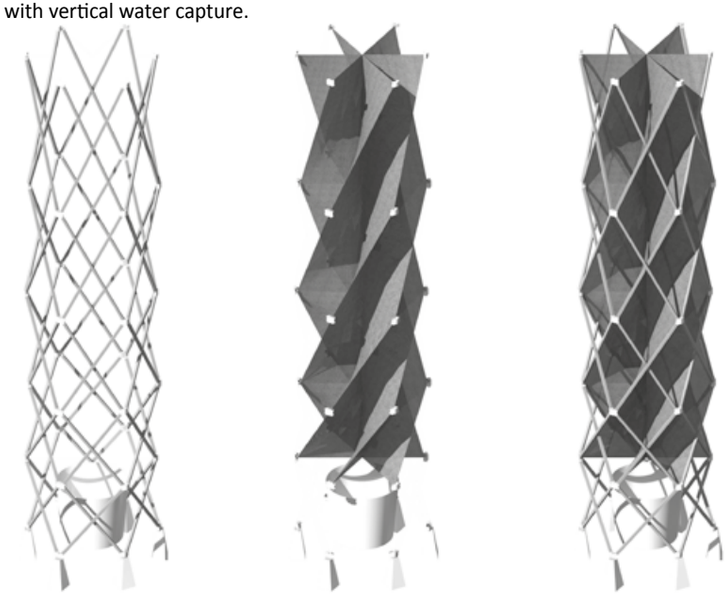
We innovate in the development of self-supporting and extensible vertical wood-based structures that allows us the capture of water, using 3D printed joints and laser-cutting plates, creating a highly transportable existing three-dimensional wood frame, adapting the solution to material sections by demand, simplifying the transfer and assembly of these with local and geographical realities.

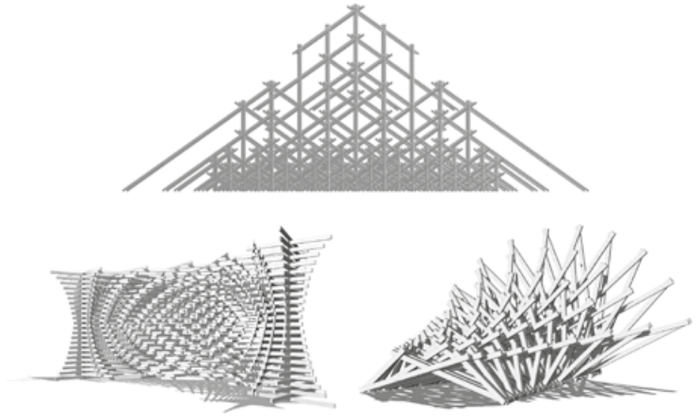
COASTAL FOG TOWER

FORMS

CHILE

We worked with joints designed in visual algorithms by rhino-grasshopper, manufacturing the resultant pieces in 3D printing with ABS in 30% of density, reinforced with customised 1mm galvanised steel plates in the exterior face for traction forces. Investigating three-dimensional structural patterns that allow us the minimum use of parts and maximum size and resistance possible in the vertical direction, we developed a contemporary approximation of formal and design organisations compatible with vertical water capture.



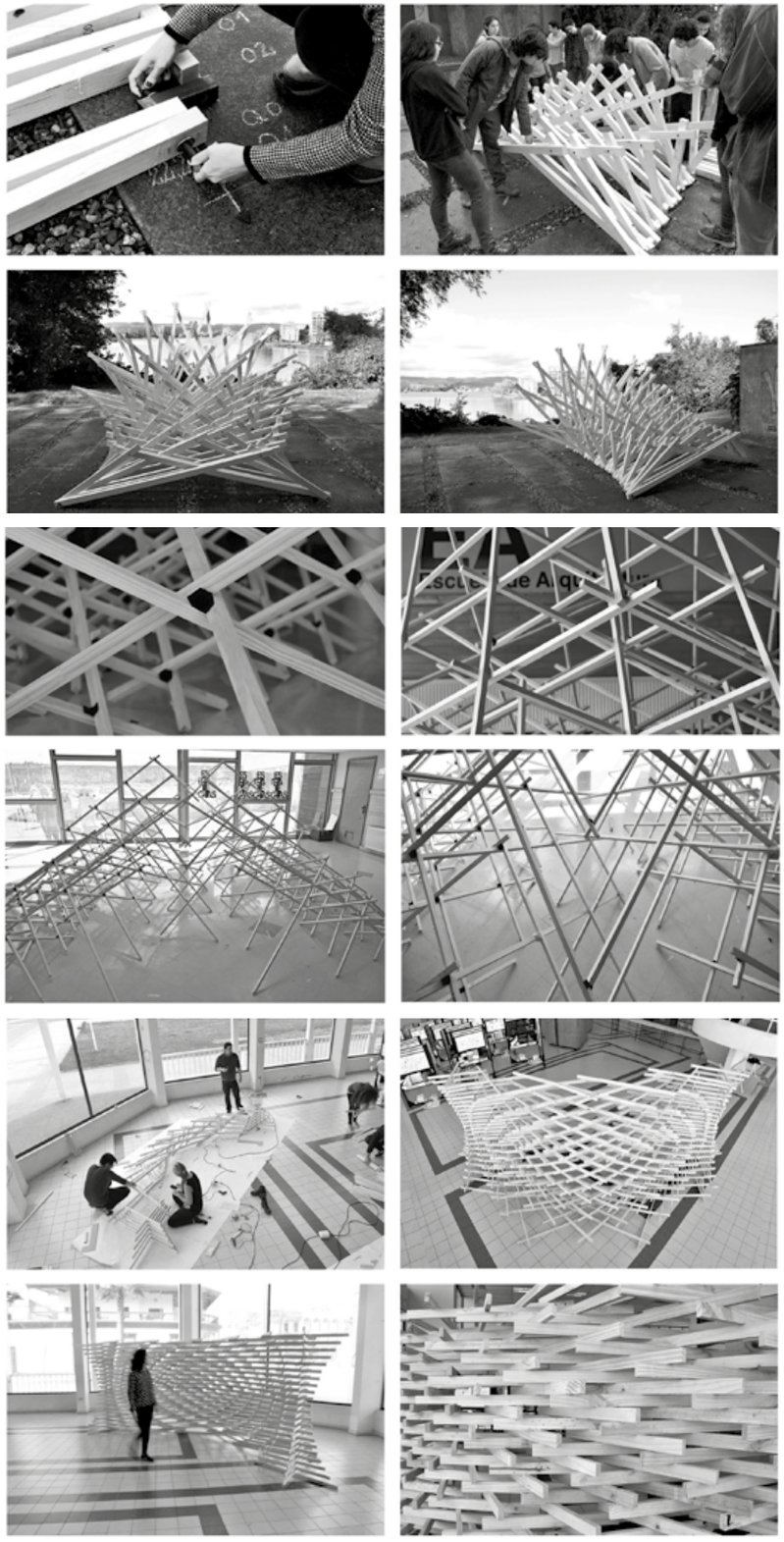


DISCRETE STRUCTURES

DUM DUM LAB
CHILE

VIDEO

Discrete Structures is a series of temporary wood pavilions developed by Dum Dum Lab in alliance with 3 Schools of Architecture of Chile, Arturo Pratt University of Iquique, Austral University of Valdivia and San Sebastián University of Puerto Montt, this within the framework of the project "Workshops Series" financed by the Fondart 2017. The design made by Francisco Calvo, Katherine Cáceres and Gonzalo Vegas seeks to establish a design space limited to finite and regular elements, based on 3 × 2 "and 2 × 2" pine timber, exploring their combinatorial properties to from a certain freedom in terms of the length and angles of each timber. The installation in Valdivia, corresponded to a structure that arises from the variation of a truss, establishing a pattern of subdivisions and angulations that share linear axes in its lower zone. The second installation in Iquique, was developed based on a wall typology, where the wooden frameworks were configured vertically by stacking a diagonal grid with a variable subdivision. The third installation located in Puerto Montt, was based on the study of stereometric structures, establishing fractal variations of material accumulation, from fragile and light linear elements and plastic unions made of PLA printed in 3D. The design logics were developed considering the difficulty of moving the installation from our office in Valparaíso to Iquique, Valdivia and Puerto Montt. For this reason, all the steel elements corresponding to the fixings, were prefabricated in the Materials Laboratory of the Architecture Department of UTFSM (LaboMat). While the cutting and drilling of the wooden slats was developed in the facilities of each University. All these tasks of cutting, drilling, enumeration and subsequent final assembly of the installation was developed with students who take between the third and fourth year of each school of architecture that we visited.



VIDEO

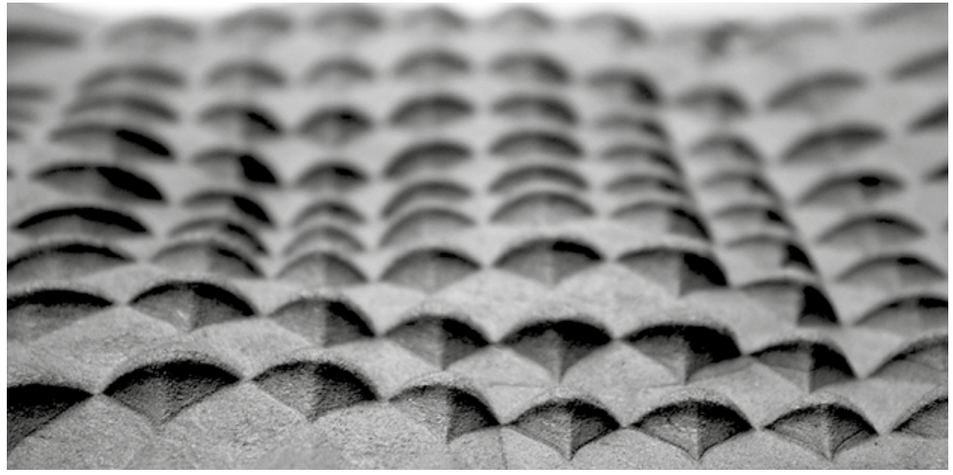
BIO-INSPIRED PARAMETRIC SURFACES

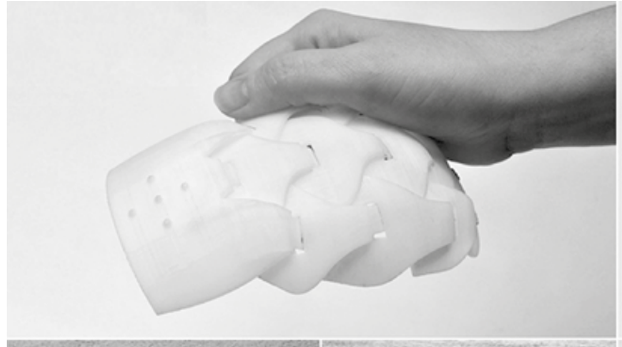
MORFOLAB

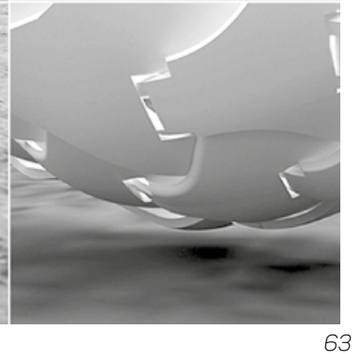
COLOMBIA

Designers, architects and different creative professionals have used biomimicry, as a recurrent tool to solve human problems through the identification of characteristics and strategies of nature. On the other hand, digital fabrication technologies and parametric design softwares have been emerging in the last decades changing the paradigms of how the designing-prototyping-validating process is made. This technological integration has never-before-seen possibilities, with advantages such as: direct and immediate manufacture, complex geometries generation impossible to be made with traditional technologies, high degree of accuracy, manufacture of armed assemblies and integration of different materials in a single process (multimaterial), among others.

The biological surfaces and textures have a fundamental role for the subsistence of the species and their adaptive process in nature, these membranes constitute the surface that separates the inside from the outside of the organisms. The surfaces and textures have important functions in the organisms since they delimit and give structure to the body of the individuals, protect from temperature changes, facilitate the thermal regulation, help to protect attacks of predators and blows, and perceive the outside. Nowadays, there is no defined methodology to transfer the morphologic characteristics of natural surfaces to artificial elements in special through digital fabrication technologies and parametric design softwares. As a result of the analyzed antecedents, this investigation proposes the designing a repertoire of bio-inspired parametric surfaces, generated through parametric software and digital fabrication technologies. The repertoire has been based on the study of vegetal species in the area of Medellín in Colombia. This project has been proposed with the aim of being used by designers, architects or professionals belonging to the Cultural and Creative Industries to improve aspects of functionality, use and aesthetics features in their projects.







The objective was the development of a response to mitigate Heat Island Effect, and improve energy efficiency of built surfaces in Recife´s metropolitan region. It consists of a biomimetic parametric artefact that acts as a “microclimate generator”. Basic design criteria for the artefact considered, variable shading, permeability, hygroscopic behavior, and planting compatibility. Another forefront consideration was the potential for local and regional economic development.

In response to this last consideration, the artefact was made of form molded compressed coconut fiber. A regionally abundant material, coconut fiber is malleable, has tensile strength and natural hygroscopic behavior. Gypsum 3D printed 1:5 scale prototypes of the artifact were used to generate the molds. Form molding and compression processes allow for economy of scale, and diverse pattern development.

The combined prototyping process and materials allow structural strength and planting compatibility. The material consists of low-density intertwined fiber, mammon flexible resin and hydrogel, that naturally absorbs 400 times it´s weight in water. Combining the coconut fiber and hydrogel ensures hygroscopic behavior, reproduces the evaporative effect, and allows for the expansion of hydrogel capsules maintaining the geometry.

LEAF BRICK

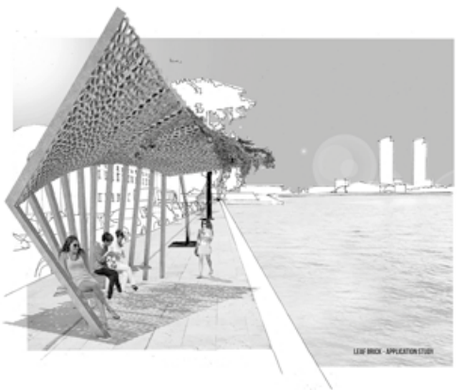
NEXUS - UFPB

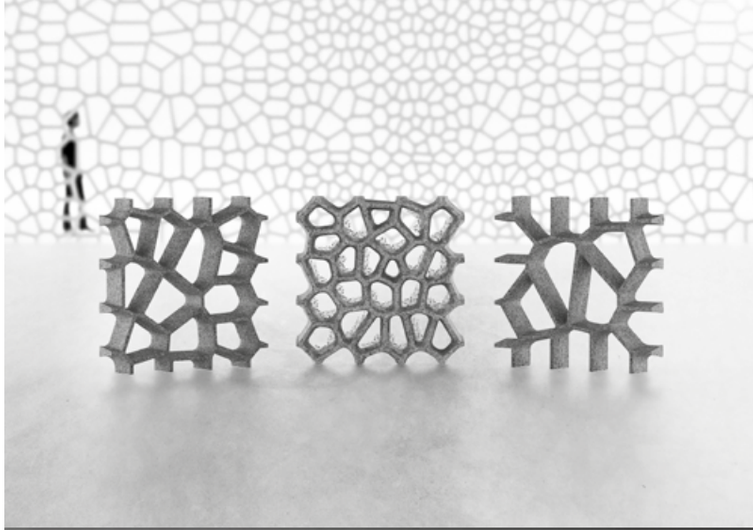
BRAZIL

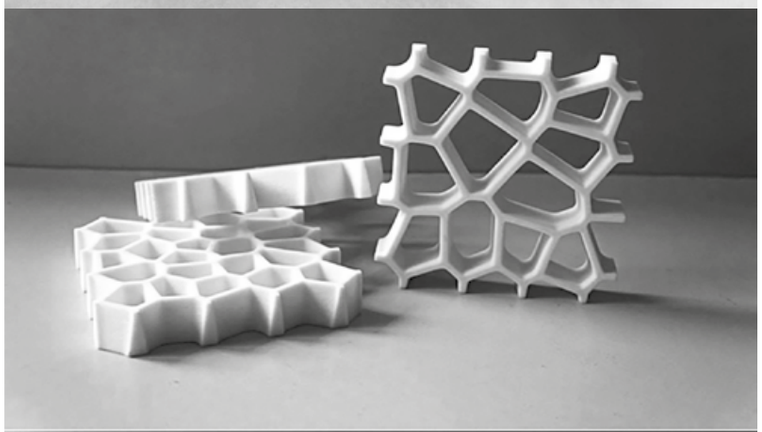
Application flexibility was a necessity, as the artifact should respond to unforeseeable urban landscape integration projects. Thus, each module offers different shading opportunities, compatible with Recife´s solar geometry requirements. The Leaf Brick also allows for any combination of types and positions by using five contact points between each module and multiple point Voronoi structures. Positioning of types of Leaf Brick on a system responds to an automated simulation process within the model. Thus, if the system´s design is altered, the positioning and type of the Leaf Brick respond to specific demands of the design context. Initial Laboratory tests indicate that the proposed material outperforms reflective material surface temperatures in 4 to 10 degrees Celsius.

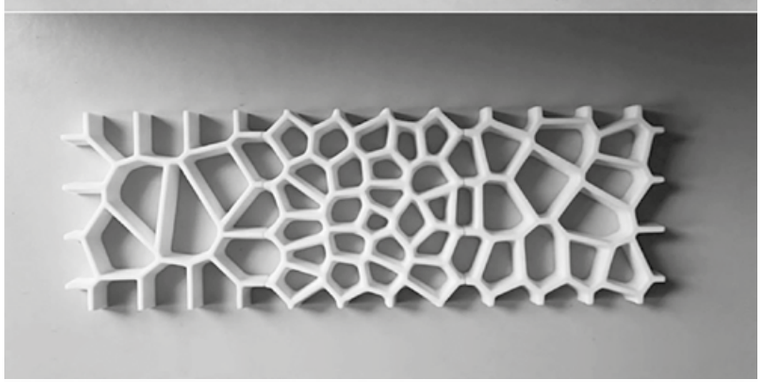
VIDEO

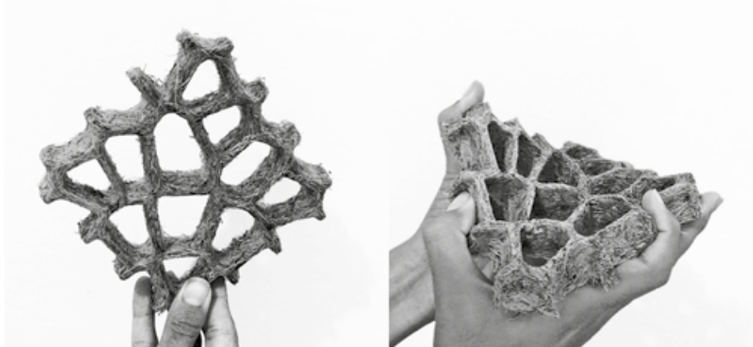
The concept reinforces regional economy growth and considered multiple sustainability aspects, like: modularity, parametric responsiveness, flexible applicability, permeability, local materials, and regional economic sustainability.

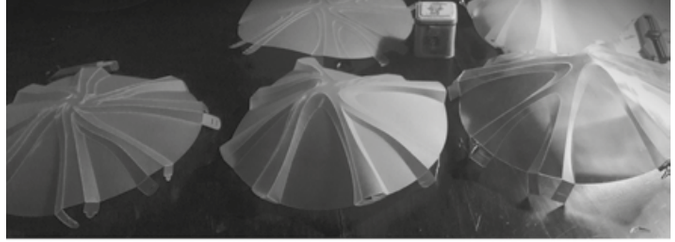


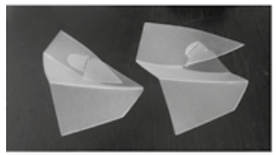


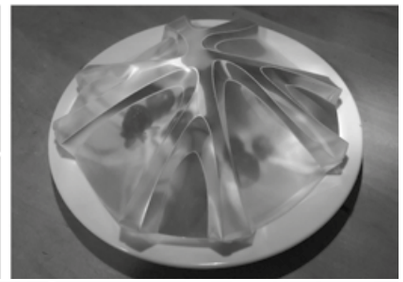


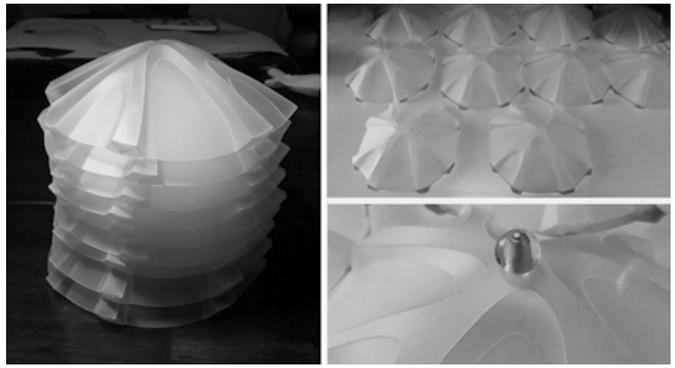












VIDEO

Throughout our research on the connections between morphology and digital fabrication, we had noticed that the expansion of 3D printing, had wrongly relegated laser-cutting technologies and labelled them as tools that could only provide stereotypical solutions. However, they are an interesting option for low cost productions when relevant generative strategies are used.

CURVED FOLDING

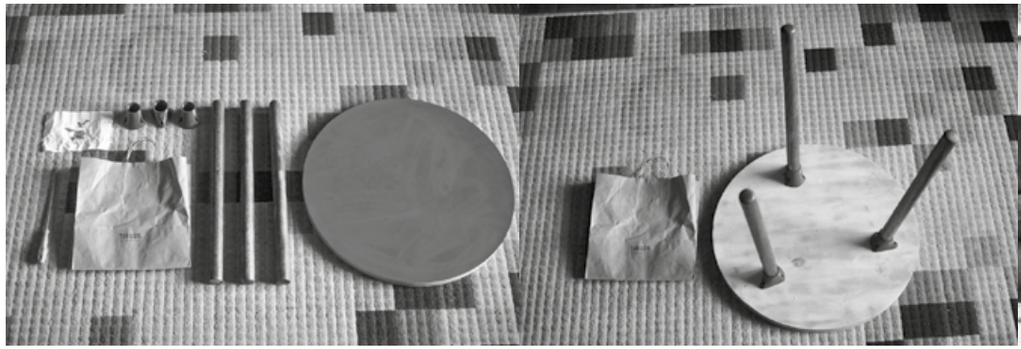
IEHU - INSTITUTO DE LA ESPACIALIDAD HUMANA. LABORATORIO DE MORFOLOGÍA

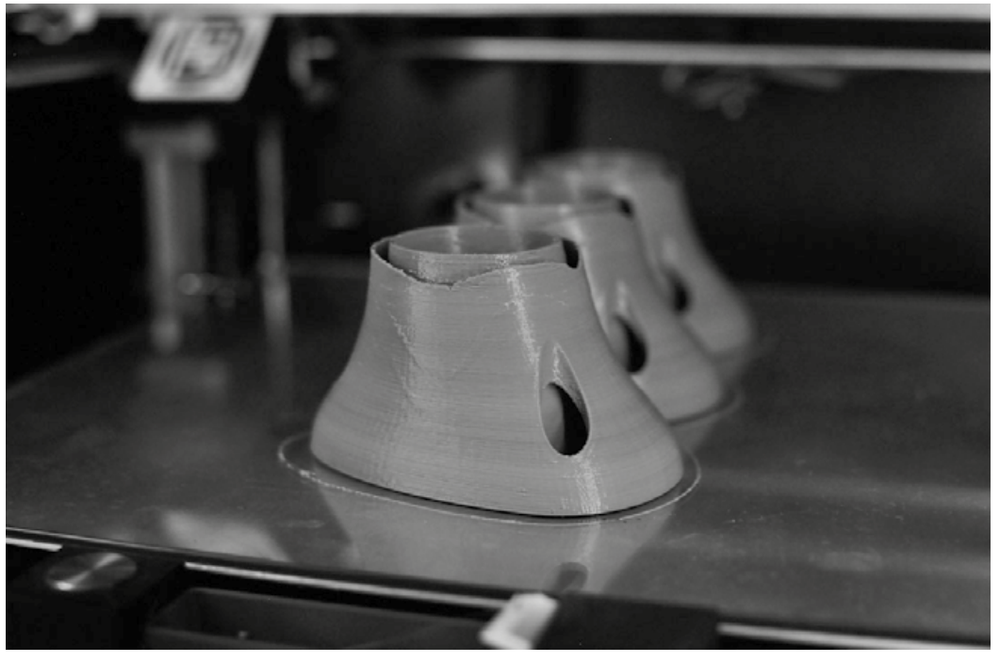
ARGENTINA

An attractive deviation in our research about curved folding through laser cutting was the design of a cloche, which was part of the presentation of the Argentine candidate – Emiliano Schobert – for the International Cuisine Competition, Bocuse D´Or.

The cloche should contribute to keep the food warm and to preserve its scent, so it was decided to work with a surface close to a semisphere. It must also focus the judges attention on what will be unveiled when the plate is displayed, consequently it was resolved to work with translucent polypropylene that would provide the tension between concealing and revealing the contents of the presentation. Its shape ought to evoke the chef´s design concept, the woods in Patagonia, which fulfilled the contest requirement of including regional attributes and flavors, therefore folds representing forked branches were selected. On the other hand, as the fifteen units had to be transported, they should allow stacking or flat packing. The unfolded cloche derives from a circle that changes from 2D to 3D through curved folding with binds that sustain the necessary tightness and limits the folding angle.

This project shows how different activities can be associated, where research promotes the application of its results in areas in which digital media are scarcely used. It opens a spectrum of new design possibilities, potentiates creative practices and is a complement for the specific work of the chef, collaborating in the communication of the ideas that organize the presentation.





360º FURNITURE

EDRO

BRAZIL

The 360º Furniture project has as its origin the understanding that the barrier between atoms and bits is disappearing, as both dimensions of contemporary existence, the real and the virtual, are merging. Thus, a flexible, customizable, scalable and easy-to-produce line of furniture and objects is born.

Analyzing the maturing maker culture and its rapid advance in recent years, we realize that human desire, or rather need, to reach out and build the environment around itself is nigh unstoppable. As a response, we have created a line of simple, well-resolved designs that combine ordinary objects such as broomsticks and hoes with 3D printing technology.

VIDEO

This dichotomy of High-Low gives objects a unique plasticity, without causing strangeness. Instead, the use of everyday elements breaks an entry barrier, since the execution of the project is so simple that it does not require previous knowledge of any craft.

We see ourselves as a global movement, a mob of good people that gathers in favor of free access to information. So everything is open, free for downloads and assembly instructions are easy to understand, language-independent videos. In sum, the 360 Furniture project has this basic premise: to democratize access to well-resolved design objects, anywhere in the world.

VIDEO

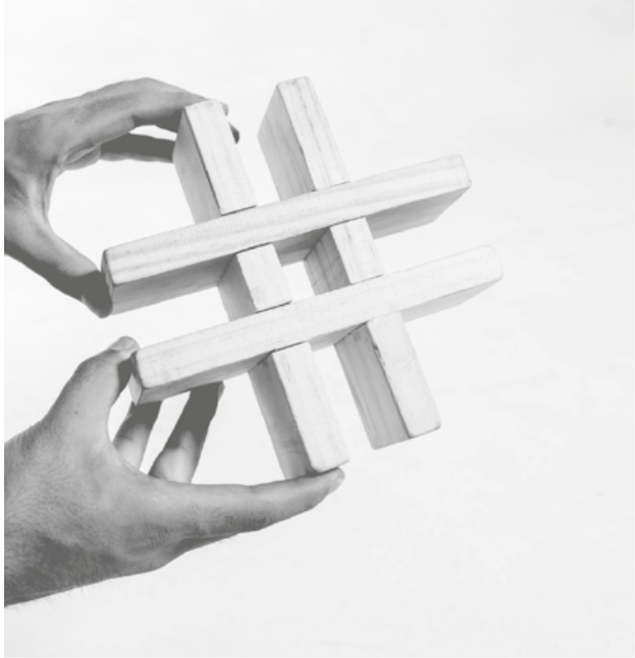
The actual conventional model defines the living place as a “consumable product”, this doesn’t allow access to the formal housing market to the broad poor sector of the population in Chile. They are forced to self-build their homes in informal urban settlements (population or favelas) into precarious habitats which do not have the minimum conditions of habitability.

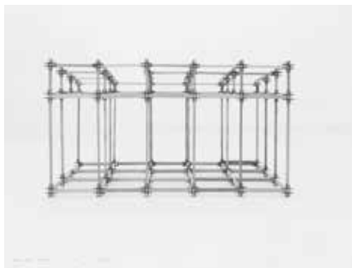
KNOT

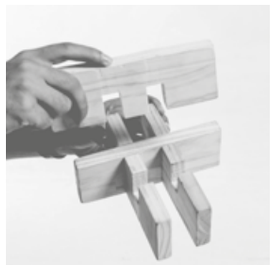
FABHAUS UC

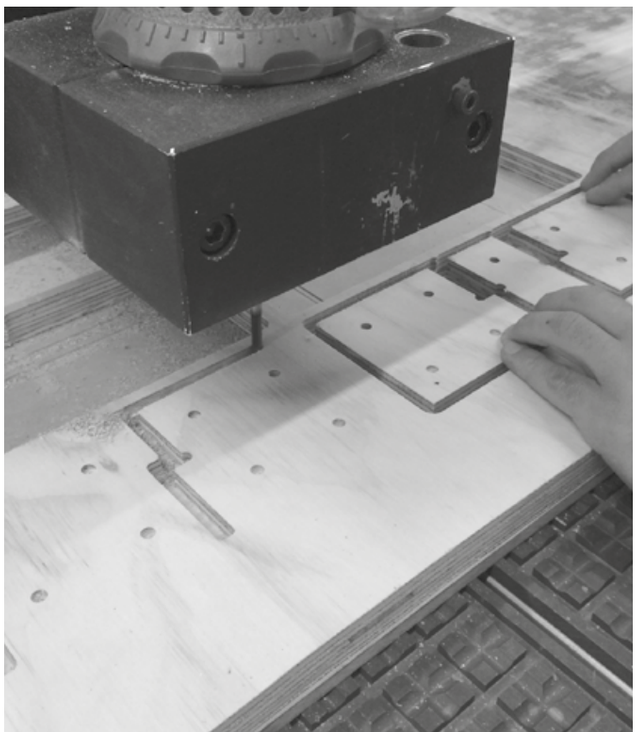
CHILE

Knot # is a housing system based on the progressive model of housing. It has a participatory (co) design plan and a complementary construction system based on a knot that allows the intuitive construction of minimum habitable modules with the ability to progressively grow in time, adapting to the requirements of each case attended. It can be assembled, disassembled, modified, transported easily, without requiring a qualified workforce.









NORTHEAST HOUSE 1.0

LM + P

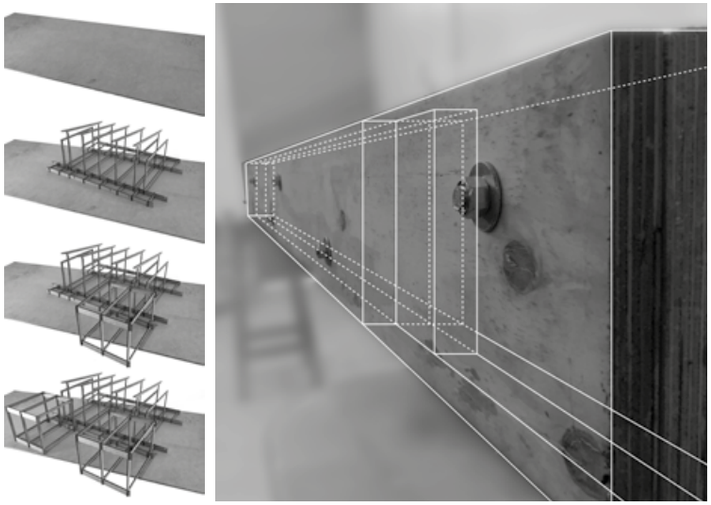
BRAZIL

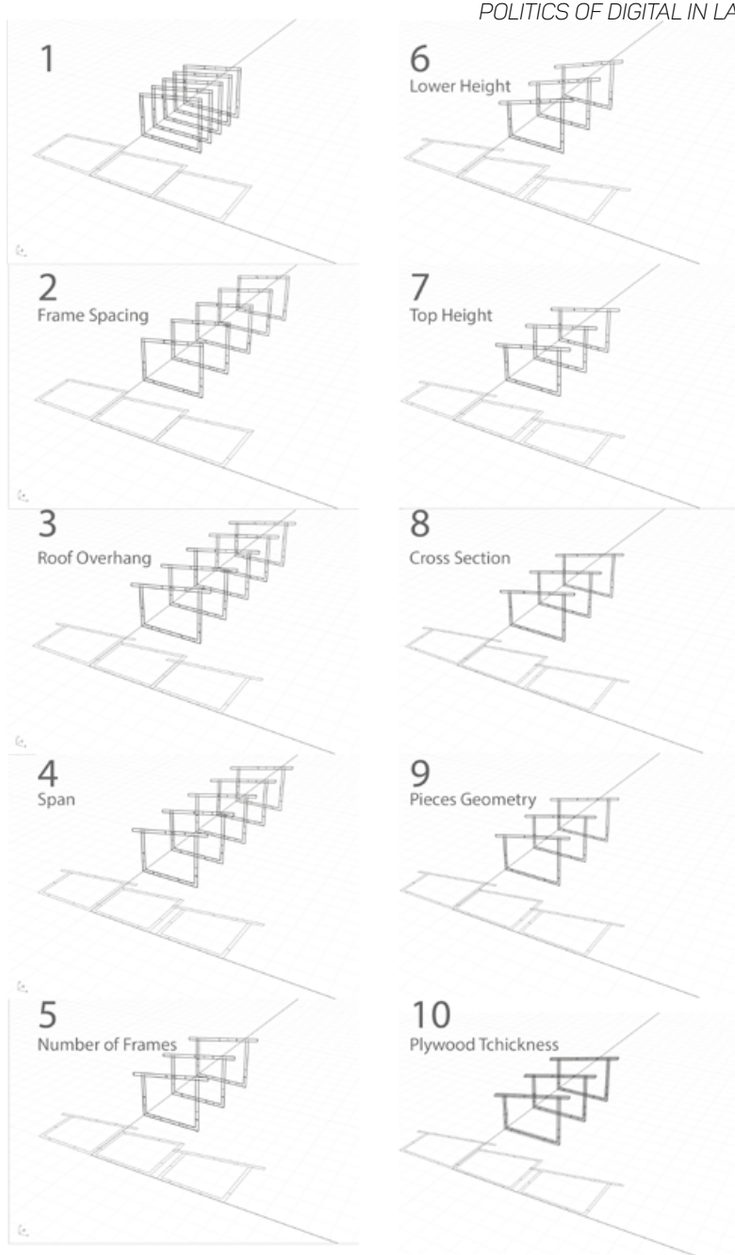
VIDEO

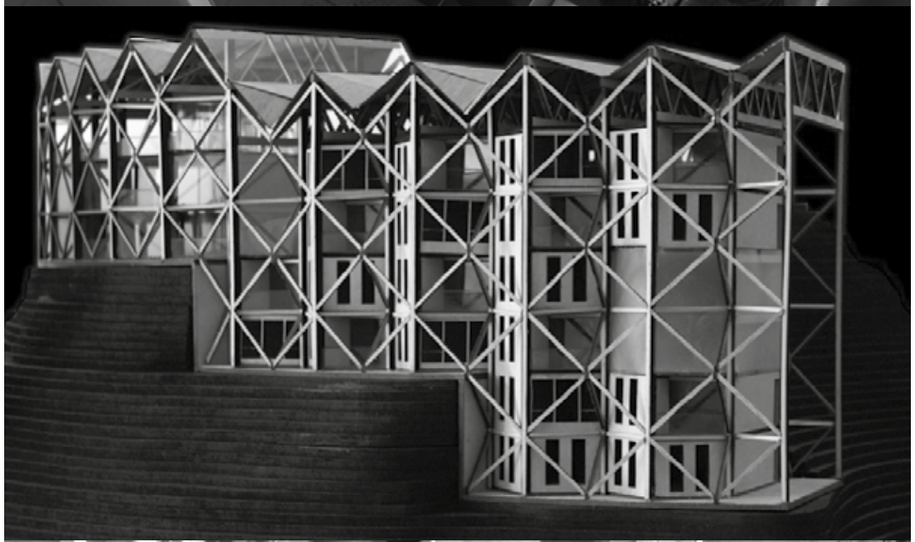
The project explores an integrated applied research and design approach supported by defined architectural design and programming methods, techniques and tools. Architectural innovation was pursued through design thinking methods, and integrated design processes supported by architectural programming to define design performance criteria, objectives and concepts. Derived from the architectural programming process, three base concepts are used as guidelines for innovation and sustainability throughout the project. These have direct impact on all architectural design processes and solutions developed.

Northeast House 1.0 goal is to digitally design and build a low-cost residence that contemplates maximum efficiency in terms of comfort and performance, that meets the principles of an evolutionary home, applicable to high density urban scenarios, developed from research, products, materials, and technologies from the Brazilian Northeast, following the principles of an open source construction. As stated, the goal encompasses three specific objectives translated into analog concepts: Evolutive Home; 100% Northeast; and, Open Source Construction.

The Evolutive Home concept permeates all of the integrated design solutions. All systems are conceived to allow for simple assembly, incremental improvements, system expansion and contraction. Examples of such applications are, modular furniture system, naval plywood structure, and automation system. The 100% Northeast concept allowed the team to fully integrate cutting edge regional research, identify regional sustainable material and products, as well as incorporation of locally developed technologies. Examples are, the use of activated charcoal from the coconut's mesocarp, development and implementation of an inhouse management interface, and use of a locally produced thermoacoustic roof. Finally the Open Source construction concept, allowed exploration of algorithmic design principles, digital fabrication and rapid prototyping processes. These were used to conceptually develop cut patterns and structural joins, mock up the structural model, test energy efficiency, define furniture design, as well as house assembly principles.







XIII ARCHITECTURE COMPETITION MADERA21

CREATIVE ROBOTICS AT UTFSM
CHILE

The undergraduate architecture students Michelle Ramírez, Natalia Medina, Noelia Bravo, Paula Villablanca, Tania Vera, Alexis Fernández, Víctor Barrenechea, Sergio Cassane, Miguel Cid, Diego Santiago, Vicente Ponce, Rafael Fuentes and Víctor Tobar of the Universidad Técnica Federico Santa María (Chile), Marcela Faria of the Pontifícia Universidade Católica de Campinas (Brazil), Edson Oliveira of the Universidade Paulista (Brazil), Laura Carducci, Eleonora Sorio and Joaquín Estrada of the Politecnico di Milano (Italy), Ottavia Ballardini of the Università degli Studi di Ferrara (Italy) and Vera Burkhardt of the Technische Universität Berlin (Germany) participated in the 13th Architecture Competition 2018, which was organized by the Madera21 association of the Chilean Lumber Corporation. The challenge of the contest was to design a five to seven-story wooden building intended for residential and complementary purposes. Five teams of students focused on the parametric design of easy-to-assemble structures using prefabricated timber-to-timber joints by an industrial robot. Timber-to-timber joints differ from steel-to-timber joints by transmitting forces directly from one member to another by contact and friction through the interlocking geometry that is carved on each member and holds them together. Students used a KR AGILUS robot in the development of prototypes to machine their own designs of timber joints, as well as laser cutters, 3D printers and a 3-axis CNC milling machine to make their structural design proposals. The five design proposals were developed during the course Advanced Architectural Design Studio I, conducted by Francisco Valdés, Francisco Quitral and Luis Felipe González during the first semester of 2018. The work of the students was exhibited at the Week of Wood 2018, between August 8 and 12 at the Centre Gabriela Mistral, GAM, in Santiago, Chile. Pablo Encina, laboratory manager from the LABOMAT materiality laboratory, supported the development of physical models.

VIDEO

MAKER HOME

TU TALLER DESIGN

COLOMBIA

VIDEO

THE TINY CONCEPT

Tiny means small, comfortable and providing what you need. Tiny is inspiration. We believe our product is the perfect fit for a dynamic, connected world where people want to use the minimum to the maximum.

We do not build houses without reason. We give people an opportunity to have a home that is environmentally responsible and in tune with its surroundings.

“We believe that homes can be efficient, well-designed and environmentally sound, which we accomplish by combining digital modeling and fabrication with an expert design and management team. We give you the option of building a different kind of home that is both modern and in tune with its surroundings.”

MAKER HOME MISSION AND VALUES

Why?

We believe that homes can be efficient, well-designed and environmentally sound.

How?

We combine digital modeling and fabrication with an expert design and management team.

What?

We provide an option for a different kind of home that is both modern and in tune with its surroundings.

VIDEO

LOUNGE FOR BRAZILIAN VENTURE CAPITAL FIRM

SUBDV ARCHITECTURE AND DESIGN

BRAZIL

The Monashees+ Venture Capital office reception project is characterized by a fusion of ancient cultural philosophies with contemporary design aesthetics; as well as simple materials and craft with high-tech digital design and fabrication processes.

The brief presented by feng-shui design consultant Marisa Volonterio, envisioned a calming fluid lounge setting whose design and fabrication would exemplify the cutting edge technology of the start-up app firms it sponsors. Referencing a futuristic, aero-dynamic design aesthetic, the continuous sofa and bar of the waiting area demonstrates this progressive fantasy of an inter-connected and borderless world to channel productive energies.

The furniture pieces wre modeled using continuous topologies in animation software, which underwent a digital sculpting process in the articulation of the surfaces for the sofa seats, bar tops and niches. A specific algorithm was developed in parametric software to automate the preparation of the files for fabrication. First, a script sectioned the 3D model according to the maximum depth of the CNC milling machine, and second, the script identified sections with negative slopes to be inverted.

With the fabrication files generated by the algorithm, the polystyrene sections were CNC milled, numbered and grouped, which defined the overall shape of the furniture pieces. These were used as the base for the resin and fiberglass application, and the final lacquer paint finish. The final pieces were than hoisted up 18 floors and into the narrow window frame, a size restriction which defined the configuration of the 3 furniture pieces of the lounge.

Once in place, the furniture elements were wired up and received under-lighting, to create a floating effect that further emphasized this aerodynamic design. The bar was also configured with the infrastructure for the Virtual Reality mask and controls, which welcome visitors that arrive at the Monashees+ offices.

VIAJES ROSARIO BOUTIQUE TRAVEL AGENCY

DESSIN TECHNISCH

PERU

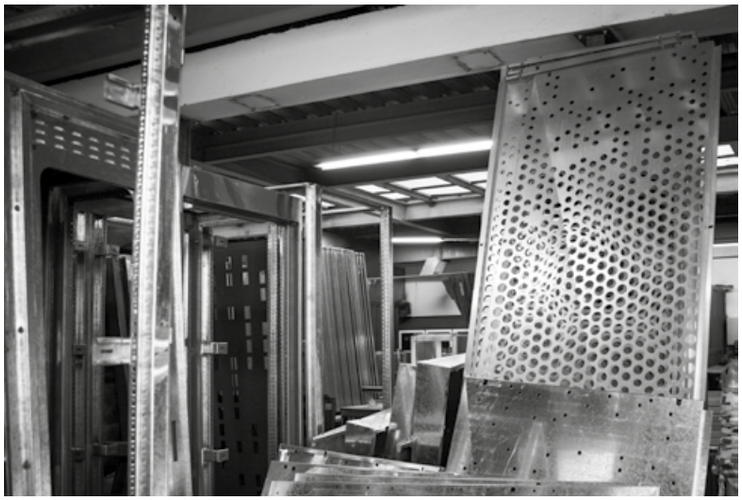
The office interior implementation for Viajes Rosario boutique travel agency offers to the user the full experience of traveling just by entering the agency.

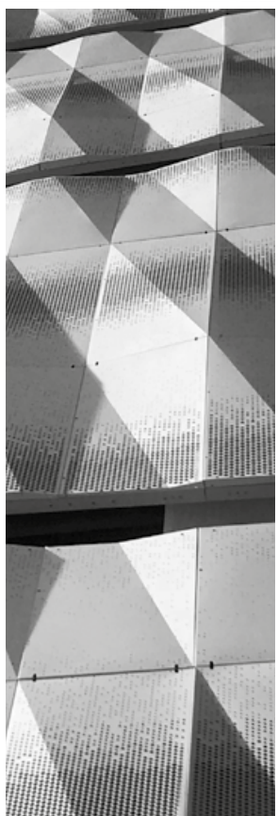
Continuity between all the spaces was accomplished by using wooden pine ribbons that wrap the entire ceiling and boardroom. The ribbons are on a profile section of 10cm x 1.5cm spaced every 10cm to allow access to mechanical kit above. Over 900m long of ribbons are hanging above.

To generate this wooden surface, digital design was used through handling Rhinoceros and Grasshopper platforms. This software allowed not only the 3D visualization, but the generation of all the wooden ribbons parametrically coordinated so the search of the aesthetic acceptance could be easily manipulated to generate de desried option. The 3D model had differente constraitns such as headroom height, maximum curvature radius, distance between bulges and distances between each ribbon. All of these pine wood elements of 1.50 x 10.00 cm were digitally fabricated by using subtracting digital fabrication: CNC router machines. There are over 60 different curved pieces which needed to be coded to be able to place the puzzle together.

Next to the wrapped ceiling, a 10m by 10m world map was hanged as additional ceiling feature made by 18 plywood sheets of 1.50 cm thick. Fire sprinklers and lighting had to run through the world map so several perforations had to be fixed.

VIDEO





GENERAL FACADE, SQUARE 85 PROJECT

FRONTIS 3D

COLOMBIA

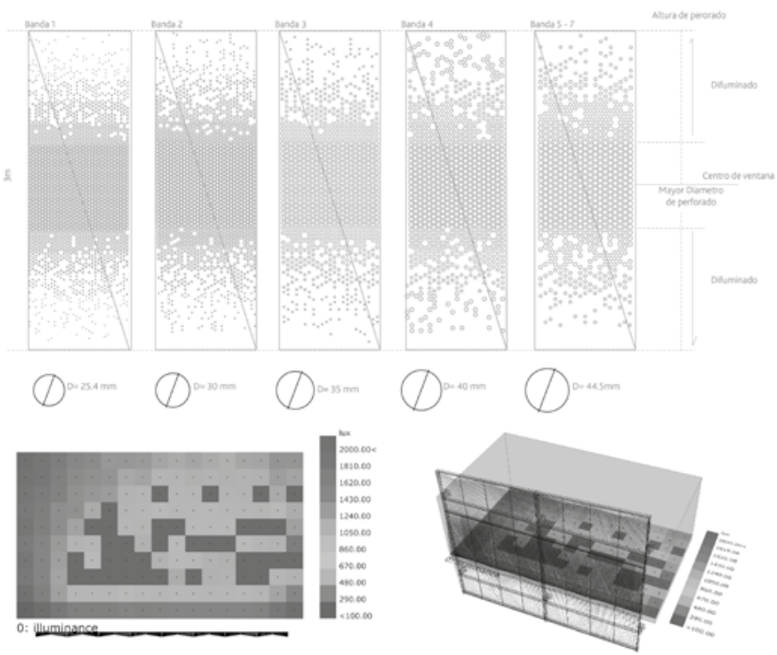
Square 85 is a 16 storey multi-use (office and hotel) building in Bogota, CO, originally planned with a non-standard external façade that was developed, manufactured and installed by FRONTIS3D. The design and construction of the 4500m² facade took place from late 2017 to early 2018.

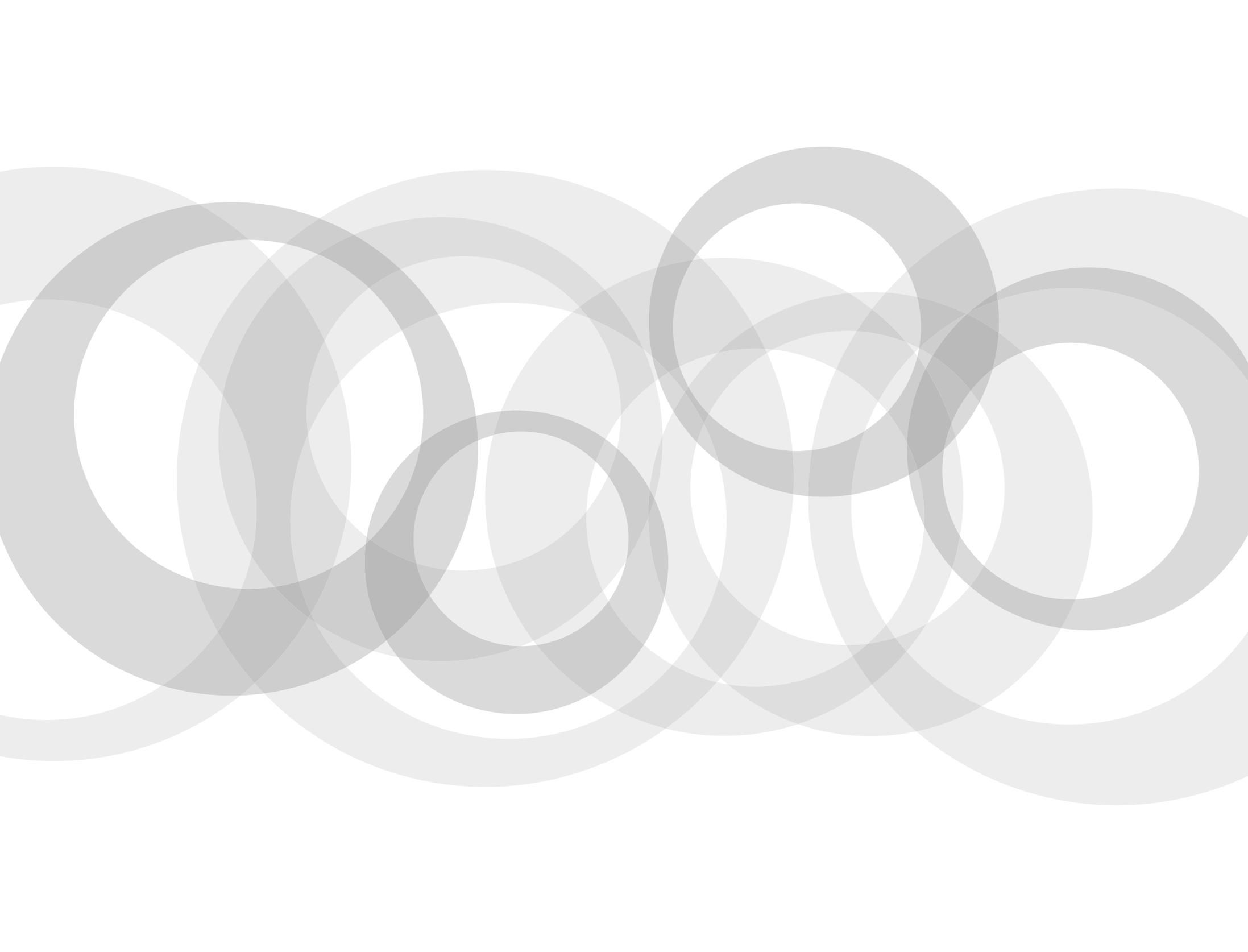
The façade was conceived as a customized skin to the building that would allow for bioclimatic comfort inside without the use of mechanical systems, whilst giving the building a specific look from the outside. Given the high complexity and non-standard nature of the project along the time constraints for its development, it was not possible to completely define the scope of the project and plan according to it, a traditional sequential (waterfall) development cycle would not be viable. Instead, an iterative process with continuous communication and feedback cycles was required, which implied the adjustment of the project management triangle (Scope-Cost-Time) from the traditionally plan driven model into the Agile quality driven model.

VIDEO

The project was designed as a series of frames made from vertical U-shaped steel profiles of 100x100mm and horizontal folded metal sheet mechanically fastened to connecting steel joints. To connect the frames to the building, custom supports strong enough to hold the weight of the loads on the cantilevered structure had to be designed to comply with existing local regulations. The system comprises 1700 panels, supported on 182 frames and 392 supports.

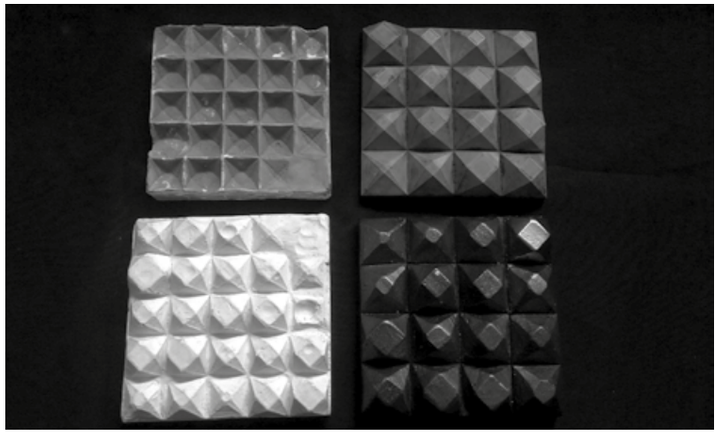
Custom perforations were required for each panel depending on its position relative to the closest window, the closer the panel is to the window the bigger perforations had to be, allowing to avoid the overheating of interior spaces by solar radiation, yet but without closing the views of the city.





3

ARTISANAL-DIGITAL + CULTURAL ARTEFACTS



The following project was developed at the Digital Fabrication Laboratory, as an experiment that combines both fabrication techniques: digital and by-hand, in order to fabricate 9 identical tilings. Also, to work with digital fabrication – in particular 3D Printing - in real scale of 1:1.

None of these goals were ever explored at the University, and the experiment proved to be interesting and complex enough to be repeated in the next semesters. The project was developed with Architecture students from the assignment “Design and fabricate”, for approximately 6 weeks (May to June, 2018).

The hybrid fabrication process, conducted by the students followed these steps:

VIDEO

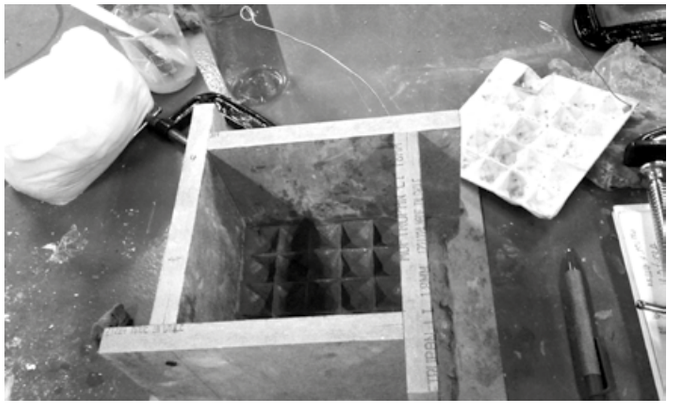
1. Digital design of the piece with Rhinoceros and Grasshopper (positive piece).
2. 3D printing of the piece, 1 to 1.
3. Assembly of the molding - casting box.
4. Preparation of the clay for molding (negative material).
5. Pressing the geometry into the clay (positive piece into negative material).
6. Preparation of the plaster (casting material)
7. Casting of plaster into the mold, vibration, timing, etc.
8. Removal of the piece (tiling) when it is done.
9. Cleaning, polishing and painting.
10. Assembling of the tiling in a board, arranged in 3 lines and 3 columns.

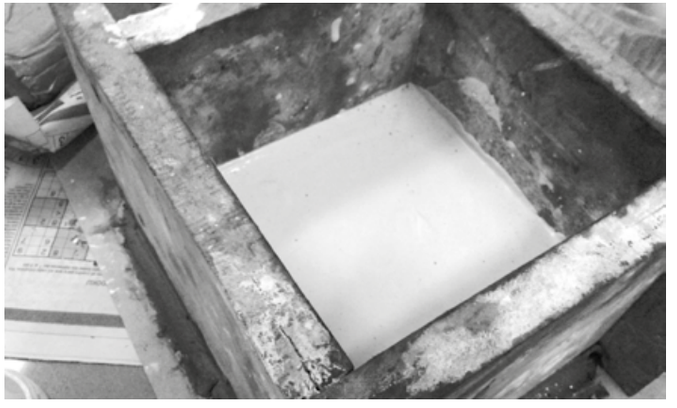
ARTISANAL-DIGITAL TILE FABRICATION

LABORATORIO DE FABRICACIÓN DIGITAL – UNIVERSIDAD PILOTO DE COLOMBIA

During the fabrication process, short experimentations were held by the students in order to achieve better or unexpected results, such as: different mixes of clay so that the tilings were lighter, painting combining two colors, and attachments of the tilings to the board with special glue.

One of their achievements, was the resolution of the geometry pressed into the clay, so that the students were able to cast piece after piece without the need to edit the mold, or to repeat the process of pressing the geometry after every casting.





Artesana Lab, an educational program created by Fab Lab Maya, is designed to encourage new production methodologies that specifically benefit local Mayan handcraft production. Within the large network of indigenous communities around the city lies the village of Tihosuco, where several handcrafting techniques originate. By strengthening local technology education, a connective “node” between Cancun tourism and the local Mayan Culture can be established.

The initial proposal consisted of a feasibility analysis, resulting in the conclusion that Mayans lack technical education - teaching them digital fabrication technology up front would be impossible without first delivering a specific methodology in a language they can comprehend.

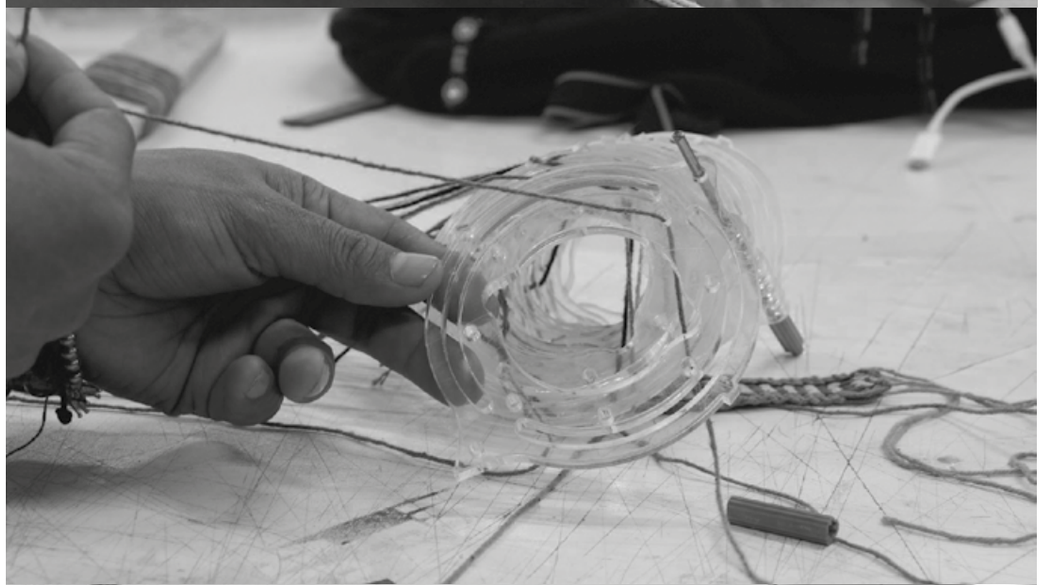
CRAFTSWOMAN LAB

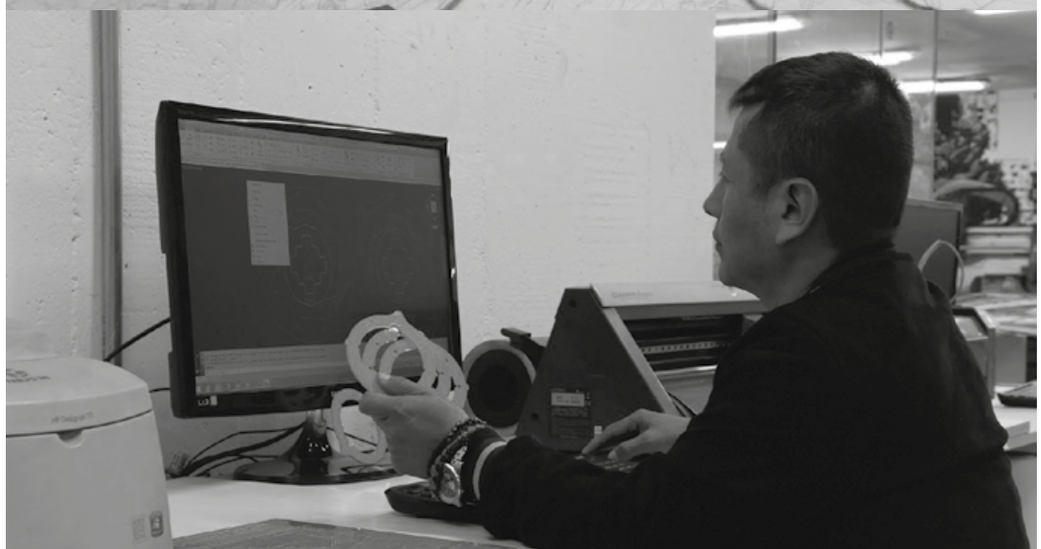
FAB LAB MAYA
MEXICO

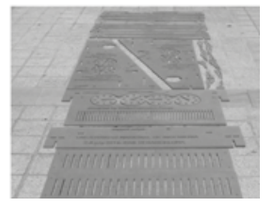
Artesana Lab is the culmination of several diverse efforts to blend traditional handcrafting techniques with the innovation of village youngsters who possess an engineering background. After several attempts to combine local handcrafting with digital fabrication, they’ve now achieved new standardized creations while preserving the local culture of native Mayans.

In this way, Fab Labs helps artisans from Mayan communities preserve their traditions, while affording them an opportunity to increase their incomes and open new doors to local and international tourism. It is our hope that someday soon, indigenous handcrafts will no longer only come from China.

VIDEO







Pedal loom is a mechanism of pressed cardboard device (MDF) and threads that allow to weave up to 90 cm of width. This offers special features when it comes to handling, assembling, disassembling, transportation and usability that turn it into a portable mechanism with high performance, in textile length as well as in weaving and design variety. The pedal loom is intended to be a work tool for artisans, to teach, for entertainment or for domestic purposes.

Backstrap loom for the blind — the proposal is applied to the weaving process called backstrap loom and it is constituted by a main piece (heddle rod) shaped as a disc with perforations and ducts with the function of selecting the threads when designing Andean iconographies. The main motivation to develop this tool was to promote handicrafts among the most powerless sectors (blind, handicapped, atrisk youth, etc.), since there are no tools designed for this part of the population that helps them achieve their economic independence. This tool allowed to innovate the traditional system (kallua), leaving the wood aside. With this system, the disk can direct the change between threads with the touch of the blind person to later proceed to the warp aperture during the weaving of the textile and its diverse iconographies. As complement, it has the reading system for the blind (Braille) on the disks which facilitates the handling and thread selection to design the garment.

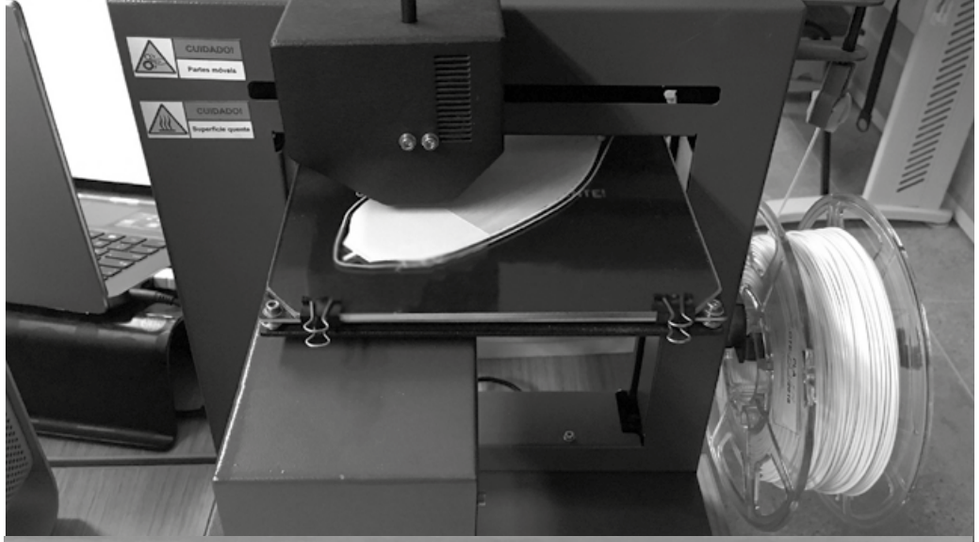
PEDAL LOOM 1.0 + LOOM FOR BLIND PEOPLE 2.0

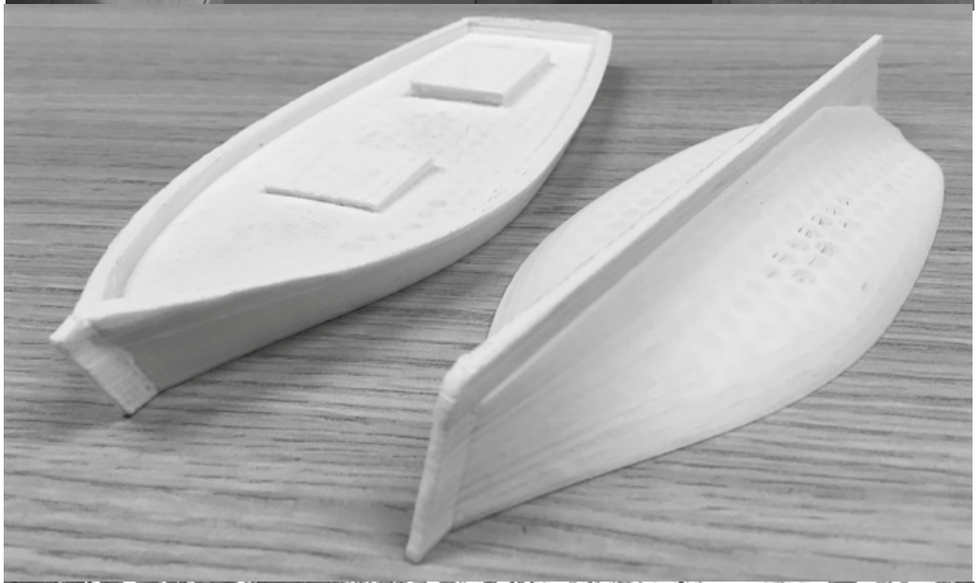
FAB LAB UNI

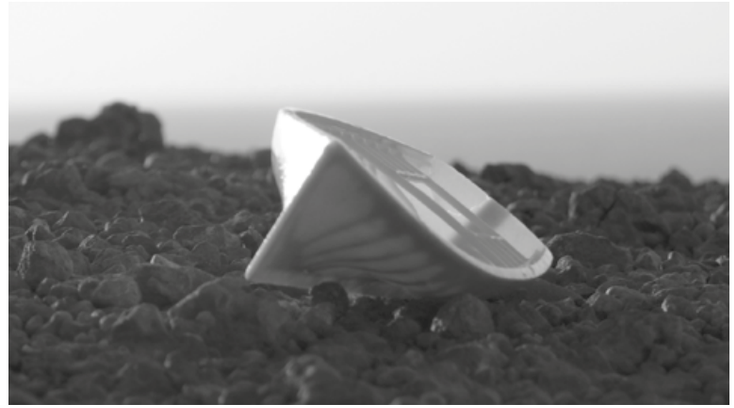
PERU

VIDEO

Ludic manual loom — exclusively designed to teach children between 8 and 12 years old. This loom is fabricated with a laser cut acrylic sheet with pieces that can be easily assembled and are easy to make.





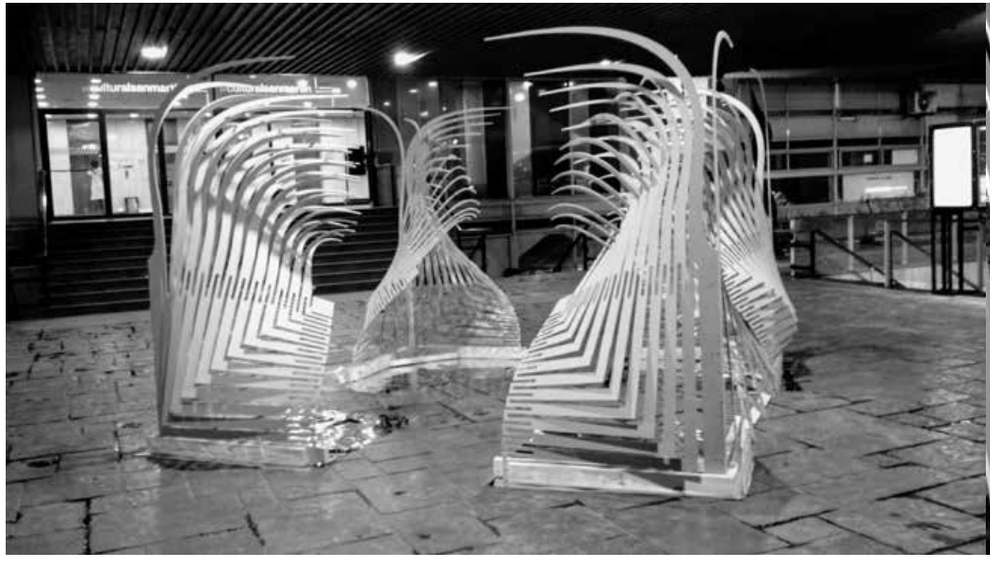


The project started in 2017 as a research project of the Federal University of Ceará, seeking to foster dialogue between information technologies and heritage conservation, a scenario in which digital technologies of representation, design and manufacturing serve the enduring vernacular practices as a powerful documentary tool. The central object of the debate is the sailing boat of the municipality of Icapuí in Ceará, where the fishing is a way of life, and consequently, boats are a fundamental part of this system. Through interviews with the naval carpenters it was noticed that the manufacturing processes resulting in the boat outline has clear routines and proportions, which ensure that the boats meet both the functional qualities and the adaptation to the technological reality, material and cultural heritage of the place. Moreover, the construction of the boats is not preceded by a design, but the qualities desired for the object are lapidated by manual manipulation of guiding lines of construction of the shape occurred during the execution, by the handling of the flexibility and rigidity of pieces of wood and through the deformation of steel rebar. Therefore, the use of the digital tools to document vernacular artifacts, has proved interesting to describe the complexity of a language. Thus, the records of the processes took shape in the interface of Grasshopper, enabling through a computational algorithm to cover a type, a connected set of individuals, that constitute the Boat. In this way, some boats were chosen for photogrammetry and implementation in the code, and later a model was prototyped materialized by means of 3D printing, and its realization made possible a new visit to the people who make up the construction culture of the boats, returning the information collected through the model as a way of encouraging the maintenance of this valuable local culture.

VIDEO

MODELING AS MEMORY OF VERNACULAR ARTIFACTS

LED-UFC
BRAZIL

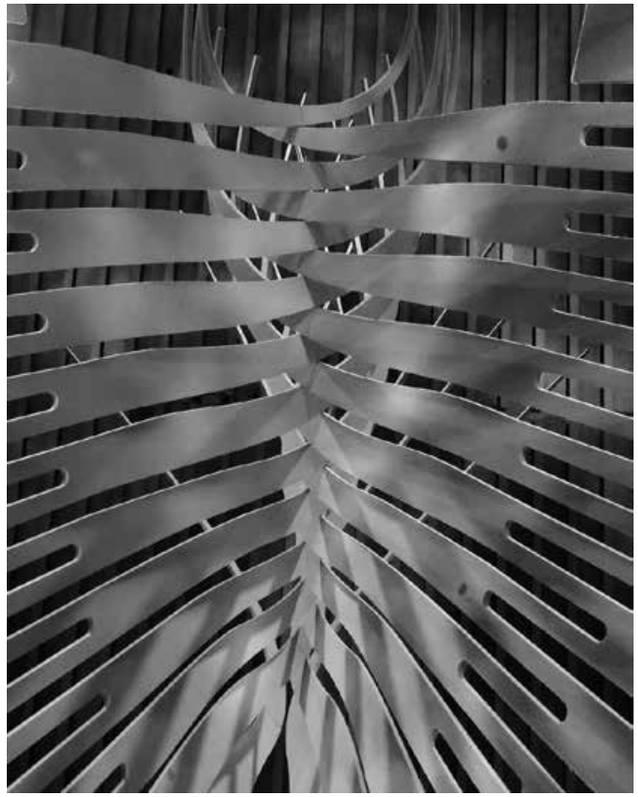


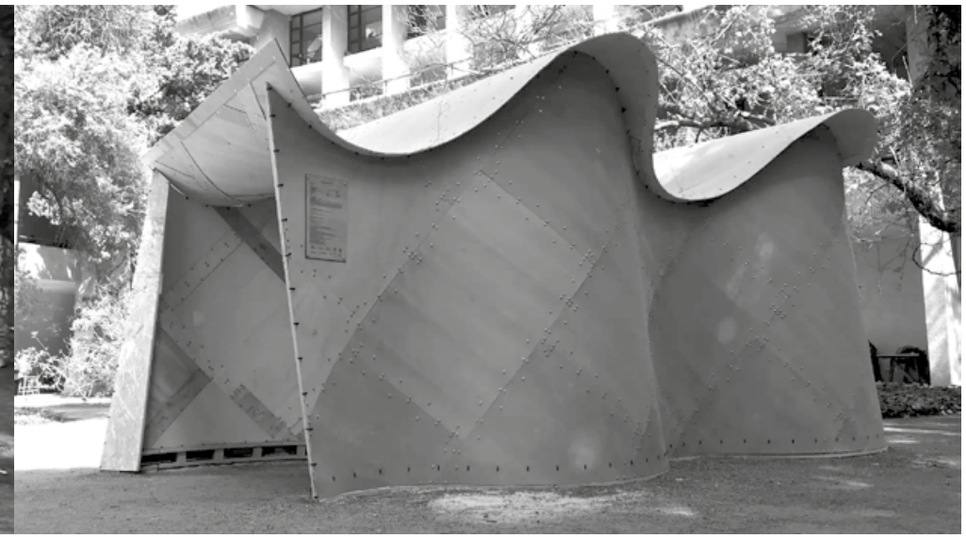
A.L.A.D.A. (Digital-Analogic Algorithmic Laminar Artifact) is an experimental project that combines parametric-analog morphogenesis and digital fabrication in a process of architectural-spatial discovery based on cut-flexibility that results in a metaphorical operation, a kind of simultaneous Muybridge-style kinematic capture. The experience arises from the collaborative interaction between two research projects of the Universidad de Buenos Aires 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 (TaMaCo-CheLA). 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 in the context of the Electronic November Festival 2017 organized by the San Martín Cultural Center.

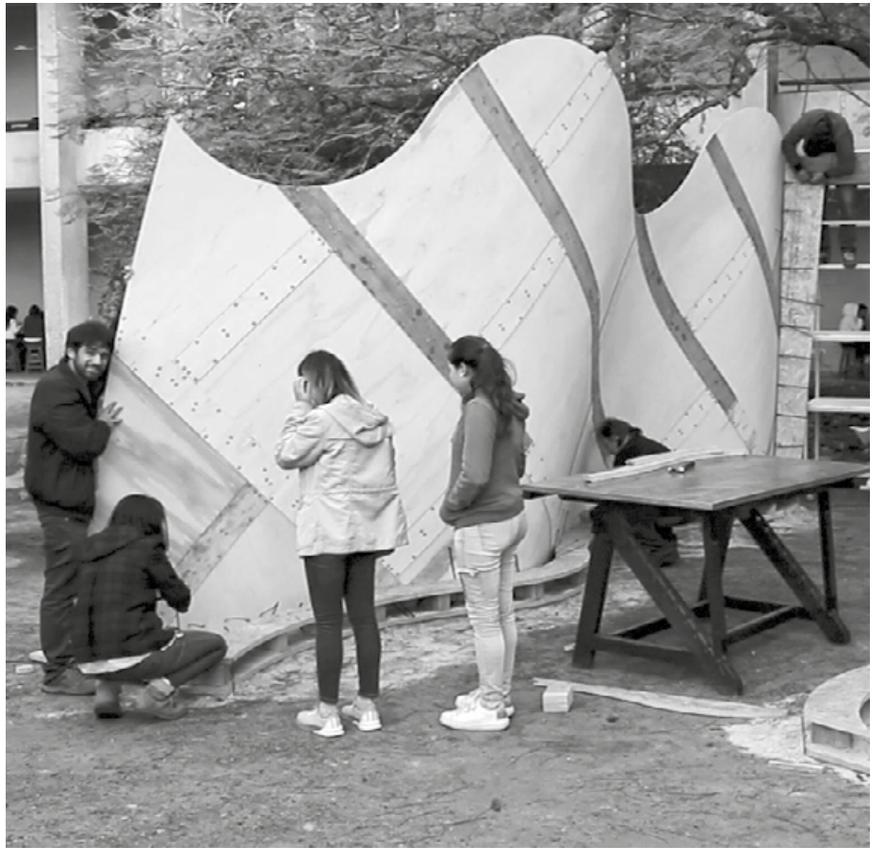
ALADA

IDLAB + TAMACO-CHELA
ARGENTINA

This device could not have been made with traditional carpentry systems. Only digital technology allows this realization with viable costs and without having to make special devices. This is fundamental because of everything mentioned at the beginning, but also because experimentality requires contemplating error and failure as a concrete possibility. If we can be sure of success there is no experiment, or even no design. It should be noted that although the final configuration is complex, the entire project uses only eight plates with a single cutting process, with a simple joining system. The A.L.A.D.A. artifact is composed of four configurations, located at the vertices of a square. Each of these parts is made up of two modules, orthogonal to each other, linked by a base and by the interlacing of the fringes. The weight and the friction are the ones that define their final location. Each of the configurations is self-supporting.







DIESTE PAVILION

LABFAB MVD
URUGUAY

This project intends to reflect on the morphological generation of complex architectural forms from an experimental level, in an academic context. This reflection arises from the planning, design and production of a pavilion inspired by the forms of Eladio Dieste, reinterpreting them from descriptive geometry, parametric design, and digital fabrication. The realization of pavilions, beyond becoming a global trend in several avant-garde university centers, is an opportunity for the construction in 1:1 scale of complex morphologies, capable of carrying out different mathematical notions of descriptive geometry. With this practice, the aim is to transmit the basic concepts of geometry to students, applying them to design and to a constructive exercise. This case study is a light structure, made entirely of wood. It was proposed as an ephemeral, lightweight, and low-cost architecture, capable of being reusable and assembled with general guidelines or even an instruction manual. This architecture is based on the geometrical properties of developable surfaces. The limitation regarding the necessity to invoke developable surfaces obeys to the choice of the manufacturing method, based on the cutting of 4mm thick plywood sheets. Proposed prototypes are self-supporting skins made of a single layer of material. With parametric algorithms it has been possible to deploy these complex surfaces in flat pieces that were cut using CAD-CAM technology. These were mounted on the ground as a large puzzle, then curved in cold in the place of destination, to acquire its final form and strength. This curvature was achieved by the geometric shape itself. The proposed system tries to give architectural response from the logic of limited material resources (a thin sheet of material) and the minimum cost in assembly (self-construction), while generating a real production experience in atoms of a digital construction in bits.

VIDEO

MAP OF CITIES AND COUNTRIES IN THE EXHIBITION

MAP OF CITIES AND COUNTRIES IN THE EXHIBITION

Monterrey Felipe Carrillo Puerto	**MEXICO**
San Salvador	**EL SALVADOR**
San José	**COSTA RICA**
Medellín Bogotá	**COLOMBIA**
Lima	**PERU**
Fortaleza João Pessoa Recife Belo Horizonte Viçosa Juiz de Fora Campinas São Paulo Rio de Janeiro Florianópolis	**BRAZIL**
Santiago Valparaíso	**CHILE**
Buenos Aires	**ARGENTINA**
Montevideo	**URUGUAY**

INFORMATION ABOUT LABORATORIES

The following texts are the responsibility of the authors.

ACONCAGUA FABLAB

[ACONCAGUA FABLAB]

The Aconcagua FabLab, developed by academic designers of PUCV, is a digital mobile manufacturing laboratory mounted on a vehicle that carries the following at 6 workstations: CNC Router, Laser Cut, 3D Print, Scanning, Physica l Computing and Computer Assisted Modeling. From 2014 to date, in each town or city of Chile visited, we have engaged with manufacturing communities and schools in order to realize creative activities, learning from experience in the exercise of the collective construction of material devices that they make sense in the pure event of their invention.

Valparaíso, Chile.
Team: Juan Carlos Jeldes Ponto, Leonardo Aravena Yañez
Pontificia Universidad Católica de Valparaíso.

http://www.ead.pucv.cl/temas/aconcagua-fablab/

CIPIT LAB

[CIPIT LAB]

CipitLab is a digital fabrication fab lab and hackerspace for children in San Salvador. Named after cipit, the nawat word for child, this space is oriented towards the development of educational programs for youth and children through games and experiences with traditional knowledge, with the goal to serve children and youth from local public schools and other institutions. Make Tinker Learn (MTL) was the first series of workshops of a broader K-12 curriculum called Kids Making Things, currently being developed by members of Fab Lab El Salvador and Creativity Labs, and supported by Hackerspace San Salvador.

San Salvador, El Salvador.
Team: Carlos Valladares, Emilio Velis, Kate Samson

https://www.facebook.com/FablabElSalvador/

CREATIVE ROBOTICS AT UTFSM

[CREATIVE ROBOTICS AT UTFSM]

CreativeRobotics at UTFSM is a research and development initiative of the Department of Architecture at the Technical University Federico Santa María to find useful applications of industrial robotics in architectural creation. It was launched in 2013 by Luis Felipe González and Cristián Calvo as a pioneering attempt in South America to introduce industrial robot programming into the architectural design studio. The inclusion of Francisco Quitral in 2014 added motivation and skills to create further applications. Robotic timber framing is one of our main research interests towards the production of affordable and quality housing in our country.

Valparaíso, Chile.
Team: Luis Felipe González Böhme, Francisco Javier Quitral Zapata, Cristián Javier Calvo Barentin
Department of Architecture at the Technical University Federico Santa María.

http://arquitectura.usm.cl/computacional/

DESSIN TECHNISCH

[DESSIN TECHNISCH]

Dessin Technisch is a cutting edge architecture practice based in Lima. Our approach is focused in research, technology and innovation to develop refined design for complex projects within international standards. The direction of the practice is set by Federico Dunkelberg and Sophie Le Bienvenu who achieved worldwide experience with Zaha Hadid and Norman Foster; together with a team of specialist collaborators work closely with the client to solve bespoke solutions. Our portfolio includes a range of small and big scale projects including infrastructure, master-plans, buildings, spaces and objects. Dessin Technisch main objective is to leave a legacy in a growing city.

Lima, Peru.
Team: Federico Dunkelberg, Sophie Le Bienvenu.

https://www.dessin-technisch.com/

DIGITAL FABRICATION LABORATORY - UNIPILOTO

[DIGITAL FABRICATION LABORATORY - LAB FAB UNIPILOTO]

The University Piloto de Colombia and its Programme of Architecture, were founded in 1962 at Bogotá (Colombia) by Architecture students. In the passing fifty-six years, this School of Architecture is responsible for innovative proposals that have shaped the way students learn Architecture. It is ranked as High Quality Programme in Colombia, and is recognized as one of RIBA´s Validated International Course.

The Digital Fabrication Laboratory is the newest laboratory in the Programme of Architecture. One of its peculiarities is that great efforts are being made so that it is more and more linked to the Programme of Architecture.

Bogotá, Colombia.
Team: Daniela Andrea Camargo Molano, Paola Gómez Peña, Juan Sebastián Rivera Ramos, Erick Guillermo Roldán Roa, Gabriela Gonzales Faria.
Faculty of Architecture and Art - Universidad Piloto de Colombia.

http://www.unipiloto.edu.co/programas/pregrado/arquitectura/laboratorio-fab-lab/

DOMVS - LABORATORY OF RESEARCH IN ARCHITECTURE, URBANISM AND LANDSCAPE

[DOMVS – LABORATÓRIO DE INVESTIGAÇÃO EM ARQUITETURA, URBANISMO E PAISAGEM]

DOMVS - Laboratory of Research in Architecture, Urbanism and Landscape is a research group present at the Faculty of Architecture and Urbanism (FAU), in the Federal University of Juiz de Fora (UFJF), Minas Gerais state, Brazil. It is an interdisciplinary group committed to providing strong contribution to research areas that address intersections between design and computation, applying computational techniques to design problems on a variety of scales: from architecture to regional planning. DOMVS was created in 2015 and since then, the group's activities have developed on the confluence between research, teaching and university extension.

Juiz de Fora, Brazil.
Team: Fernando Lima, Ricardo Lopes, Vinícius Morais, Marcos Borges, Caio Almeida, Carlos Costa, Eduardo Lima, Júlia Paglis, José Recker, André Nassif, Yann Okada, Aristides Perobelli, Carolina Loubach.
Faculdade de Arquitetura e Urbanismo, Universidade Federal de Juiz de Fora [Faculty of Architecture and Urbanism, Federal University of Juiz de Fora].

http://www.ufjf.br/domvs/

DUM DUM LAB

[DUM DUM LAB]

Dum Dum Lab is a Chilean based architecture laboratory founded in 2008 by Katherine Cáceres, architect UTFSM and Francisco Calvo, architect UTFSM and Master PUC. Its main areas of development are the academy, the management, diffusion and generation of knowledge about architecture, contemporary design and fabrication technologies, space which includes research, publications, symposium curatorship and the development of workshops about parametric design and digital fabrication methodologies. Among its most relevant projects are the Workshop Series developed in different Schools of Architecture of Chile and the Symposium Performa: Architecture and Technology developed from 2015 to date.

Valparaíso, Chile.
Team: Francisco Calvo, Katherine Cáceres.

www.dumdumlab.cl

EDRO

[EDRO]

The Edro + Rafael Studart partnerships instilled with the desire to innovate. They've come together to design products that combine the process of craftsmanship and digital creation. Rafael Studart is a designer, leading a studio that explores the intersections of various fields: furniture, product, , exhibit, lettering, and graphic design.The richness of his work comes from merging these different interests. Edro is a technology company that offers solutions in scanning, modeling and 3D printing. It represents countless possibilities, the revolution and evolution in production methods, the expansion of limits. From digital to tangible on the palm of your hand.

Fortaleza, Brazil.

Team: Nelson de Oliveira Quesado Filho.
www.edro3d.com.br

FAB LAB LIVRE SP

[FAB LAB LIVRE SP, UNIDADE CEU TRÊS PONTES]

CEU Três Pontes, from FAB LAB LIVRE SP, is one of the twelve public laboratories of digital fabrication network. Located in the Jardim Romano (neighborhood), it was the sixth inauguration of the network.

Installed in the Center of Unified Education (CEU), it has as public students of the municipal schools, local residents and visitors.

This laboratory, besides to having fabrication and woodwork spaces - since its implementation - stands out with the new space where is the first public Wet Lab of the world. The Wet Laboratory will allow chemical and biological experiments, further expanding the possibilities within the space.

São Paulo, Brazil.
Team: Amélia de Souza Pereira, Yasmin Sipahi, Rita Wu, Kamila Camilo, Bruno Massayuki Nakano, Mariana Helena Mendonza.
Rua Capachós, 400, Jardim Célia.

http://fablablivresp.art.br/unidades/ceu-tres-pontes

FAB LAB MAYA

[FAB LAB MAYA]

Fab Lab Maya is a “fabrication laboratory” concept based in Felipe Carrillo Puerto, a southern Mexican city in the Mayan Zone of Quintana Roo state.

The municipality sits next to one of the most famous tourism zones in Latin America, Cancun. The two founders studied at the Institute for Advanced Architecture of Catalonia (IAAC), as well as Fab Lab Barcelona. The lab’s purpose is to introduce Digital Fabrication technology to local schools in support of projects that improve tourism - the area’s main economic activity - while preserving the local culture.

Felipe Carrillo Puerto, Mexico.
Team: Trinidad de los Ángeles Gómez Machuca, Miguel Ángel Juárez Díaz Barriga.

https://www.fablabmaya.org/

FABHAUS UC

[FABHAUS UC]

FabHaus is the Digital Fabrication Laboratory of the Faculty of Architecture, Design and Urban Studies of the Pontifical Catholic University of Chile. As an open platform for me members of the Faculty community, FabHaus contributes to the development of academic, research and professional projects with a special focus in social, cultural and technological impact in Academia and Industry.

Santiago, Chile.
Team: Tomás Vivanco, Diego Gajardo.
Faculdad de Arquitectura Diseño y Estudios Urbanos, Pontificia Universidad Católica de Chile

https://fabhaus.wordpress.com/

FABLAB MTY / CRGS - UDEM

[FABLAB MTY CRGS- UDEM]

The FabLabMTY was founded in 2014 by Daniela Frogheri, Fernando Meneses Carlos and Ana Karyna Gómez Pérez, in the Department of Architecture of the Universidad de Monterrey (UDEM-CRGS, México). It was conceived as a center for research, development and experimentation about design and spatial problematics, and with the aim of connecting the existing laboratories of the CRGS with the global FabLab network. Today the project is going through an expansion phase, which involves all the careers offered by the School of Architecture, Art and Design, empowering even more students and teachers for the use and development of new technologies.

Monterrey, Mexico.
Team: Daniela Frogheri, Fernando Meneses Carlos, Ana Karyna Gómez, Patricio Ortíz Silva, Salvador Amaro Rosas.
Centro Roberto Garza Sada, Universidad de Monterrey.

https://crgs.udem.edu.mx/arte-arquitectura-y-diseno

FAB LAB UNI

[FAB LAB UNI]

Latin America is heir to a wide range of artisanal processes (jewelry, textile art, metalwork, etc.) that are part of a living heritage which has to be conserved and potentiated. At Fab Lab UNI, we integrate ancestral techniques with cutting-edge tools (3D scanning and printing, laser cutting, CNC milling, etc) and we develop new machines that optimize mechanical processes and give artisans more time for their creative processes, which impacts directly in the product value improvement as well as its quality of life.

Lima, Peru.
Team: Walter Gonzales Arnao.
Departamento de Arquitectura, Universidad Nacional de Ingeniería

https://www.fablabs.io/labs/fablabuni

FAB LAB VERITAS

[FAB LAB VERITAS]

Fab Lab Veritas is a pioneer university Fab Lab in Costa Rica which has implemented digital fabrication in both pedagogic programs and tools to adapt the learning process on the latest trends required by the industry and the market. It is focused on the management and development of design projects for social transformation and innovation.

Our mission: To promote design projects, through processes of appropriation and technology transfer, as tools of social transformation.

Our vision: To be a reference in digital manufacturing in Latin America, in the management, development and support of social innovation processes, through technologies applied to design.

San José, Costa Rica.
Team: Vanessa Szlak, Silvia Vargas, Daniela Granados.

http://fablab.veritas.cr/

FORMS : FERNANDEZ ORTEGA RESEARCH MODELLING STUDIO

[FORMS]

Our studio based on Santiago-Chile started at the year 2008 as part of the exploration process in the frontier between architecture, design, art and technology lead by the Architect/Academic UCH-UCL Alberto Fernández G. and the Industrial designer UMayor Susana Ortega G.

Exploring the “form” designed from the local perspective as a contribution to Global issues applying BIM and Digital Fabrication in different scales, our professional practice has earned us recognition within the HOLCIM Award Next Generation, Archiprix International, Evolo Skyscrapers, Sunbrella Future of Shade, UIA-La Biennale di Venezia among others.

Santiago, Chile.
Team: Alberto Fernández González, Susana Ortega Gómez.

www.forms.cl

FRONTIS 3D

[FRONTIS 3D]

Frontis3d is a company based in Bogotá (CO) that focuses on the development, manufacture and on-site installation of special and complex projects, particularly facades for buildings. Through the use of digital tools at different design stages of the project, and using almost exclusively CNC manufacturing processes, the team provides customized and optimized solutions to the particular needs of each client, including image, budget, environmental, structural, fabrication and installation constraints. The company started in 2012 and since then has built more than 15.000m2 with projects in Colombia and Venezuela.

Bogotá, Colombia.
Team: Rodrigo Velasco, César Díaz, Javier Castañeda, Roland Hudson.

https://www.frontis3d.co/

+ID LAB : DESIGN RESEARCH LABORATORY

[+ID LAB :LABORATORIO DE INVESTIGACIÓN EN DISEÑO]

The Design Research Laboratory (+ID Lab – FADU – Universidad de Buenos Aires) seeks to stimulate research in the field of design and to promote the necessary consensus to establish specific criteria for the validation of design research. On the other hand, the +ID Lab is working on the creation of several experimental laboratories for innovation, among which are the projects of a FabLab (laboratory of digital manufacture and rapid prototyping), a MediaLab (laboratory of digital media, interactive interfaces and immersive environments), a MatLab (laboratory of new materials and hybrid materials) and an UrbanLab (laboratory of urban models and social dynamics).

Buenos Aires, Argentina.

Team: Rodrigo Martin Iglesias, Patricia Muñoz, Francesco Milano, Karen Antorveza, Damián Mejías, Diego Ocampo, Patricio Rabus, Analía Sequeira, Martín Benavidez, Heidi Jalkh.
Facultad de Arquitectura, Diseño y Urbanismo (FADU), Universidad de Buenos Aires.

http://www.fadu.uba.ar/categoria/188-id-lab

IEHU -INSTITUTE OF HUMAN SPACIALITY, LABORATORY OF MORPHOLOGY

[IEHU - INSTITUTO DE LA ESPACIALIDAD HUMANA, LABORATORIO DE MORFOLOGIA]

The IEHU, Institute of Human Spaciality is an academic space where different investigations dealing with morphology in design, architecture and urbanism take place. It includes six research units, including the Laboratory of Morphology, created in 1985.

The Institute is the seat of different postgraduate studies, internships, scholarships and theses. It groups professors and researchers from diverse design disciplines. Three central research lines are: the socio-spatial perspective of inhabiting, the transformation potential of projectual activities and form as a cultural product. Several national and international exhibitions of its production have been held in numerous universities and cultural organizations.

Buenos Aires, Argentina.
Team: Javier Fernández Castro, Patricia Muñoz.
Facultad de Arquitectura, Diseño y Estudios Urbanos, Universidad de Buenos Aires.
Foundation/Beginning with Digital Fabrication: 1985/2006.

http://morfologiadigital.blogspot.com.ar/

LABFAB MVD

[LABFAB MONTEVIDEO]

LabFab Montevideo originates in March of 2012 in the School of Architecture, Design and Urbanism of the Universidad de la Republica (Uruguay), with the name of Laboratorio de Fabricación Digital (LabFab MVD), thanks to own resources of the University and to the management of the Departamento de Informática Aplicada al Diseño (DepInfo). As of 2018, it will join the FabLab international network.

In the lab, different activities are carried out within the framework of university functions: research, extension and teaching, providing academic support to students who so request, in order to participate jointly in the training processes.

Montevideo, Uruguay.

Team: Marcelo Payssé, Fernando García Amen, Juan Pablo Portillo, Paulo Pereyra, Raúl Buzó, Ángel Armagno, Gabriela Barber, Ximena Echavarría, Ana López Boccassino, Solange Gaggero, Marcos Lafluf, Luis Flores, Lucía Meirelles, Nicolás Correa, Sebastián Hernández, Víctor Varela, Andrea Valdez, Federico Lagomarsino, Andrés Martín Pastor.
Facultad de Arquitectura, Diseño y Urbanismo, Universidad de la República.

http://www.fadu.edu.uy/labfab/

LABORATORY FOR OTHERS URBANISMS

[LABORATÓRIO PARA OUTROS URBANISMOS - GRUPO DE PESQUISA ESTÉTICAS DA MEMÓRIA NO SÉCULO]

The Research Group Aesthetics of Memory in the 21st Century CNQP/FAU-USP integrates the Laboratório para OUTROS Urbanismos based at FAUUSP. Coordinated by the Associate Professor Giselle Beiguelman it is formed by graduate students (master and doctorate), artists, architects, designers, and curators who investigate digital media related to the contemporary city, architecture, art, archive, memory, spaces of information and representation. The noise, the error, the ruin present in the informational layers of the urban environment and the digital failures in the daily life of the contemporary society are among the subjects of discussion by the Research Group.

São Paulo, Brazil.
Team: Artur Vasconcelos Cordeiro (FAPESP), Nathalia Lavigne (CAPES), Giselle Beiguelman.
Faculdade de Arquitetura e Urbanismo, Universidade de São Paulo, FAU-USP.

http://outrosurbanismos.fau.usp.br

LABORATORY OF DIGITAL EXPERIENCE (LED-UFC)

[LABORATÓRIO DE EXPERIÊNCIA DIGITAL: ENSINO, PESQUISA E EXTENSÃO (LED-UFC]

LED's objective is to investigate the insertion of new technological processes in architecture and design, among which parametric modeling, information and digital fabrication, to improve the various design stages. LED (Laboratory of Digital Experience) has an exchange with DCG: Design Computation Group, Faculty of Architecture, University of Lisbon.

Fortaleza, Brazil.
Team: Daniel Cardoso, Aura Celeste, Mariana Monteiro.
Departamento de Arquitetura e Urbanismo, Universidade Federal do Ceará.

http://www.design.ufc.br/led/

LABORATORY OF LANGUAGE AND EXPRESSION STUDIES IN ARCHITECTURE, URBANISM AND DESIGN (LEAUD)

[GRUPO DE PESQUISA DAS LINGUAGENS E EXPRESSÕES DA ARQUITETURA, DO URBANISMO E DO DESIGN

The Laboratory of Language and Expression Studies in Architecture, Urbanism and Design (LEAUD) was founded in 2010 and is linked to the School of Architecture and Urbanism and the Graduate Program of Built Environment of Federal University of Juiz de Fora. The developed works articulate the research to education and extension, focusing on pertinent questions among expression and graphic representation in diverse ways of application. LEAUD is interested in many topics related to traditional techniques, either 2D ou 3D, as well as their hybridism with digital technologies, emphasising rapid prototyping, digital fabrication and parametric design.

Juiz de Fora, Brazil.
Team: Frederico Braida, Ashiley Rosa, Isabela Almeida, Izabela Silva, Janaina Castro,Marcela Cardoso, Carlos Lima, Icaro Silva, Lais Moraes, Cheyenne Barros, Caroliny Mendes, Letícia Pires,Luiz Antônio Rozendo Pereira, Rafael Dias, Mariana Zancaneli, Paloma Ferreira.
Faculdade de Arquitetura e Urbanismo, Universidade Federal de Juiz de Fora [Faculty of Architecture and Urbanism, Federal University of Juiz de Fora]

http://www.ufjf.br/leaud/

LAMO: LABORATORY OF MODELS AND DIGITAL FABRICATION

[LAMO: LABORATÓRIO DE MODELOS E FABRICAÇÃO DIGITAL]

LAMO - is an educational, research and practical lab concerned with the development and construction of models and their manufacture. The Lab in part of the Post-graduation Program of Urbanism, PROURB at the Faculty of Architecture and Urbanism of the Rio de Janeiro Federal University. It seeks to integrate the full design processes, including the generation, simulation and manufacture processes and CAD-CAE-CAM tools. The lab develops full-size prototypes and constructions using subtractive processes (laser 2d and analog cut, future CNC), additive (3d printing technologies) and transformative (analog tools, future robotics). It bridges these techniques with algorithmic and parametric design processes. Works in a network of partnerships with labs from different research fields at UFRJ, in the country and abroad.

Rio de Janeiro, Brazil.
Team: Adriana Sansão, Gonçalo Castro Henriques, Andrés Passaro, Isadora Tebaldi, Ana Moreno, Fernanda Lobianco, Gabrielle Rocha, Ronaldo Lee. Colaboration: Aurélio Wijnands, Igor Machado, Lais Kaori, Loan Tammela.
Faculdade de Arquitetura e Urbanismo, Universidade Federal do Rio de Janeiro.

http://www.lamo.fau.ufrj.br/

LAPAC: LABORATORY OF AUTOMATION AND PROTOTYPING FOR ARCHITECTURE AND CONSTRUCTION

[LAPAC: LABORATÓRIO DE AUTOMAÇÃO E PROTOTIPAGEM PARA ARQUITETURA E CONSTRUÇÃO]

The Laboratory of Automation and Prototyping for Architecture and Construction was originally created in 2006 at the University of Campinas with funds from FAPESP, and it's been kept with grants and scholarships from this research agency as well as from CAPES, CNPq, FAEPEX-UNICAMP and SAE-UNICAMP. LAPAC aims at studying generative design systems, 3D technologies (rapid prototyping, digital fabrication and 3D digitation), computer programming and automation techniques, and their application in architecture, from the design process to the construction of buildings.

Campinas, Brazil.
Team: Felipe Tavares, Gabi Celani, Lucas de Chiara, Karoline Santana, Caio Castriotto, Raquel Leite, Robson Canuto, Camilla Rozario, Gustavo Violin e Gustavo Batistela.
Faculdade de Engenharia Civil, Arquitetura e Urbanismo, Universidade de Campinas.

http://lapac.fec.unicamp.br/

LM+P - LABORATORY OF MODELS AND PROTOTYPES

[LM+P - LABORATÓRIO DE MODELOS E PROTOTIPAGEM]

Federal University of Paraíba (UFPB) Models and Prototyping Laboratory (LM+P) aims to support undergraduate and graduate studies on contemporary processes regarding 3D modeling, Prototyping, Simulation, Graphic Programing, Domotic, and Communication, from the perspective of integrated design in Architecture and Urbanism.

LM+P is institutionally a part of UFPB's Center of Tecnology's Department of Architecture and Urbanism. Through its researchers and partner laboratories provides methodological, theoretical, and technical support for the Graduate Program in Architecture and Urbanism's (PPGAU) Masters and PhD studies.

João Pessoa, Brazil.
Team: Carlos Alejandro Nome, Natália Queiroz, Cyro Visgueiro, Geovany J. A. Silva, Cristiana Griz.
Curso de Graduação em Arquitetura e Urbanismo do Centro de Tecnologia, Universidade Federal da Paraíba.

http://lmp3.webnode.com/

MORFOLAB EXPERIMENTAL MORPHOLOGY RESEARCH LINE

[MORFOLAB MORFOLOGÍA EXPERIMENTAL]

Since 1997 the Experimental Morphology research line with its Morfolab hotbed of research group have been working on topic such as biomimetics, non-conventional structures, form finding, materials and design, digital fabrication technologies, generative and parametric design and food design. The research line is integrated by a multidisciplinary team, which through experimentation and combination of different tools, techniques, processes and methods propose new paradigms for design, architecture and engineering. Morfolab has been working permanently to include Industrial Design students in research projects, with the aim to acquire their research skills in a constant transfer of knowledge and experiences.

Medellín, Colombia.
Team: Diana Urdinola Serna, Elsie María Arbeláez Ochoa, Paula Andrea Chacón Cifuentes, Ever Patiño Mazo, David Andrés Torreblanca Díaz, Andrés Valencia Escobar y Alejandro Zuleta Gil.
Universidad Pontificia Bolivariana.

https://www.upb.edu.co/es/home

NEXUS

[NEXUS]

Nexus is a design lab from the graduate program of design in the Federal University of Pernambuco, Brazil. It has an extensive experience in product and design and development, with emphasis on innovation, service design and sustainability. Currently it explores how Biomimicry can be used together with cognitive computing to shape sustainable design and innovation in a variety of fields to bring about solutions to human challenges by emulating nature's complex time-tested patterns and strategies.

Recife, Brazil.
Team: Natália Queiroz, Ney Dantas, Carlos Nome
Universidade Federal de Pernambuco.

NIMBU

[NIMBU]

Nimbu is a studio, atelier and an experimentation laboratory in architecture and design based in Belo Horizonte, MG, Brazil.

Our methodology of research and work is built on a dialogical process between theory and practice, generating feedbacks and opening

new paths to critical thinking and critical making. Our procedures comprehends the space as a result of mutual exchanges of information between numerous cultural and knowledge fields, thus allowing us to explore architecture, urbanism, scenography, design, illustration, interactivity, teaching and research with the construction of open, collaborative and non-predetermined processes.

Belo Horizonte, Brazil.
Team: Diego Fagundes, Erica Mattos.
Av. Sra. do Carmo, 221 - Sl 322 . CEP 30310-000. Belo Horizonte, MG, Brazil.

http://nimbu.com.br/site/

NÓ.LAB

[NÓ.LAB]

The Nó.Lab was founded in 2014 and collaborates in research and teaching of undergraduate and graduate course (Master's Degree - PPG.au) in the Department of Architecture and Urbanism (DAU/UFV), at Federal University of Viçosa. We are a team of 4 professors of Architecture, undergraduate research assistants and master- degree students who work in collaboration with Engineering and Computer Science Departments in areas involving design, prototyping and manufacturing process. Our current researches are focused on digital modeling, responsive architecture, file-to- factory processes and BIM.

Viçosa, Brazil.
Team: Andressa Martinez, Denise Mônaco, Douglas Lopes and Elza Miyasaka.
DAU/UFV - Departamento de Arquitetura e Urbanismo, Universidade Federal de Viçosa [Department of Architecture and Urbanism, Federal University of Viçosa]

www.nolab.ufv.br

ONION LAB: MULTIDISCIPLINARY DESIGN LABORATORY

[ONION LAB]

We are a multidisciplinary group, made of professionals from different fields, such as: Architecture, Arts, Photography, Design, Computing and Programming.

We have come together to create "ONION Lab: Multidisciplinary Design Laboratory", and with this, offer customized design products. Products, which are conceived through Parametric and Generative Design software; Prototyping with Digital Fabrication tools.

Our concern is not only the shape of the works, is to create them a logic of growth, with adaptability characteristics. Because what we really aspire is to offer our city, Lima-Peru, a true personalized vision of equipment and creation of the integral architectural space.

Lima, Peru
Team: Darío Sánchez Rivara, Luis Vigil Romero and Enrique Gallegos León.

http://onionlab.org/

OPEN BRAIN UPC

[OPEN BRAIN UPC]

Born in Lima, Peru, as a project of UPC - Universidad Peruana de Ciencias Aplicadas. The Open Brain UPC is a research laboratory in digital manufacturing that is transversal to several disciplines. This laboratory promotes self-learning through iterative process using digital manufacturing tools and then be shared as academic content. This is a space of transdisciplinary convergence of ideas that unites the world of prototyping, digital manufacturing and the academic world.

Lima, Peru.
Team: Claudio Velarde, Evelyn Piñashca, Gerson Machuca.
Universidad Peruana de Ciencias Aplicadas.

www.upc.edu.pe

PRONTO 3D

[PRONTO 3D]

PRONTO 3D is a Digital Fabrication network with the objective of organizing and providing strategic innovation centers throughout Santa Catarina State. It is structured with units in four different regions of the state attending Design, Architecture, Engineering and a great deal of different courses, as well as all areas that involve creation, development and production of scale models, prototypes and full scale fabrication. It assists different design process phases in a collaborative way using subtractive, additive and formative techniques. The branch in Florianopolis is certified as a FabLab since 2013.

Florianópolis, Brazil.
Team: Regiane Trevisan Pupo, Luiz Salomão Ribas Gomez.
Faculdade de Arquitetura e Urbanismo, Universidade Federal de Santa Catarina

http://www.redepronto3d.com

RESEARCH GROUP IN ART, DESIGN AND DIGITAL MEDIA

[GRUPO DE PESQUISA EM ARTE, DESIGN EM MÍDIAS DIGITAIS - GP_ADMD]

The Research Group in Art, Design and Digital Media arose from the perspective of investigating questions concerning the relationship between art and design in the context of digital media.

The activities of the Group are focused on two areas. On the one hand, considering the historical, theoretical, procedural and purpose specificities of art and design, GP_ADMD intends to discuss what epistemologically supports the links and distensions between them. On the other hand, given the emergence of digital media, it seeks to understand how these media influence and condition the modes of creation and reception of messages developed in the contexts of art and design.

The path taken by the group presupposes the intrinsic relation between the making and the thinking to be the basic element that will nurture the studies.

São Paulo, Brasil.
Team: Monica Tavares, Juliana Henno, Desirée Melo, Fernando Simões, Priscila Guerra e Sandra Kaffka.
Escola de Comunicações e Artes, Universidade de São Paulo + CNPq.

http://www2.eca.usp.br/nucleos/gp_admd/

STUDIO GUTO REQUENA

[ESTUDIO GUTO REQUENA]

Studio Guto Requena reflects on memory, culture and poetic narratives in different design scales: objects, spaces and cities. At the core of the studio's projects is an obsession to experiment with digital technologies in an emotional way. Interactive Public Furniture and Urban Art is the studio's most recent focus.

Guto Requena was born in Sorocaba, São Paulo State in 1979. He is an architect with a Master in Architecture & Urban Planning from USP – University of São Paulo. For nine years, he was a researcher at NOMADS.USP – Center for Interactive Living Studies of the University of São Paulo.

São Paulo, Brazil.
Team: Guto Requena, Felipe Merker Castellani, Nikolas Gomes, Guilherme Giantini, Vitor Reis, Lufe Gomes.

https://gutorequena.com/

SUBDV ARCHITECTURE

[SUBDV ARQUITETURA]

Franklin Lee and Anne Save de Beaurecueil of SUBdV Architecture, mix high and low design technologies to generate environmentally responsive geometries for architecture and furniture design. They have published, exhibited and lectured about their work worldwide. Since 2010, they have been directors of the Architectural Association (AA) Visiting Schools São Paulo and Rio de Janeiro, to rethink Brazilian design culture through combining cutting-edge technology with material and labor sources. They were AA Diploma Unit 2 Masters from 2005 to 2010 and taught at the Pratt Institute and Columbia University in New York, from where they both also received Master's degrees.

São Paulo, Brazil.
Team: Franklin Lee,Anne Save de Beaurecueil, Jeff Chicarelli, Júlia Tenuta, Daniel Frossard, Marisa Volonterio, Rodrigo Chust.

https://www.instagram.com/subdv_architecture/

TAMACO (ATELIER OF MATERIALS AND CONSTRUCTION)

[TAMACO - TALLER DE MATERIALES Y CONSTRUCCIÓN]

TaMaCo is a project by CheLA (Centro Hipermediatico Experimental Latino-Americano), a 5000m² cultural center settled in a former factory of Parque Patricios, a neighborhood in southof Buenos Aires. TaMaCo is dedicated to experimentation in art, design and architecture. Its equipment is composed by traditional fabrication tools (woodwork, metalwork and so on), and digital fabrication machines such as laser cutter, 3D printers, and CNC mill. Its cultural proposal includes lectures, courses on design and fabrication techniques, practical workshops, and residences of national and international artists. Since its outset, TaMaCo collaborate closely with educational local institutions and universities of the city.

Buenos Aires, Argentina.
Team: Karen Antorveza, Francesco Milano.

http://chela.org.ar/

TU TALLER DESIGN

[TU TALLER DESIGN]

We work with digital and craft processes to create our products. Our goal is to start an experiment, either by observation or by analyzing geometry and formal intentions based on previous research applications. In its development, it is proposed to create a design approach in a real context and transform it into a physical matter. Our greatest interest is thought for people and advanced manufacturing processes mixed with added value process by hand.

Medellín, Colombia.
Team: David Del Valle, Amalia Ramirez, Julian Del Valle, Andres Agudelo, Lina Marcela Cardona.

https://www.tutallerdesign.com/

LINK TO THE
YOUTUBE CHANNEL

HOMO FABER: DIGITAL FABRICATION IN LATIN AMERICA
CAAD FUTURES 2015 > THE NEXT CITY
2015

LINK TO THE
CATALOGUE

HOMO FABER 2.0: POLITICS OF DIGITAL IN LATIN AMERICA
SIGRADI 2018: TECHNOPOLITICAS
2018

LINK TO THE
CATALOGUE

H768

Homo Faber 2.0: politics of digital in Latin America / Rodrigo Scheeren, Pablo C. Herrera, David M. Sperling, editors. -- São Carlos: IAU/USP, 2018.
132 p.

ISBN: 978-85-66624-23-6

1. Fabricação digital. 2. Arquitetura. 3. Design. 4. América Latina. I. Scheeren, Rodrigo, ed. II. Herrera, Pablo C., ed. III. Sperling, David M., ed.

CDD 720.285

TECHNICAL INFORMATION

CHAIRS OF SIGRADI 2018 - TECHNOPOLITICAS

DAVID M. SPERLING
Instituto de Arquitetura e Urbanismo, Universidade de São Paulo
[Institute of Architecture and Urbanism, University of São Paulo]

SIMONE VIZIOLI
Instituto de Arquitetura e Urbanismo, Universidade de São Paulo
[Institute of Architecture and Urbanism, University of São Paulo]

HOMO FABER 2.0 CURATORS

RODRIGO SCHEEREN
Instituto de Arquitetura e Urbanismo, Universidade de São Paulo
[Institute of Architecture and Urbanism, University of São Paulo]

PABLO C. HERRERA
Universidad Peruana de Ciencias Aplicadas- UPC
[Peruvian University of Applied Sciences]

DAVID M. SPERLING
Instituto de Arquitetura e Urbanismo, Universidade de São Paulo
[Institute of Architecture and Urbanism, University of São Paulo]

DESIGN CONCEPTION

PAULA RAMOS PACHECO
TÁSSIA VASCONSELOS
RODRIGO SCHEEREN
DAVID M. SPERLING

PRODUCTION TEAM

PAULA RAMOS PACHECO
TÁSSIA VASCONSELOS
MARIANE CARDOSO DE SANTANA
RODRIGO SCHEEREN
DAVID M. SPERLING
PABLO C. HERRERA
JOSÉ RENATO DIBO
JOSÉ EDUARDO ZANARDI

SUPPORT

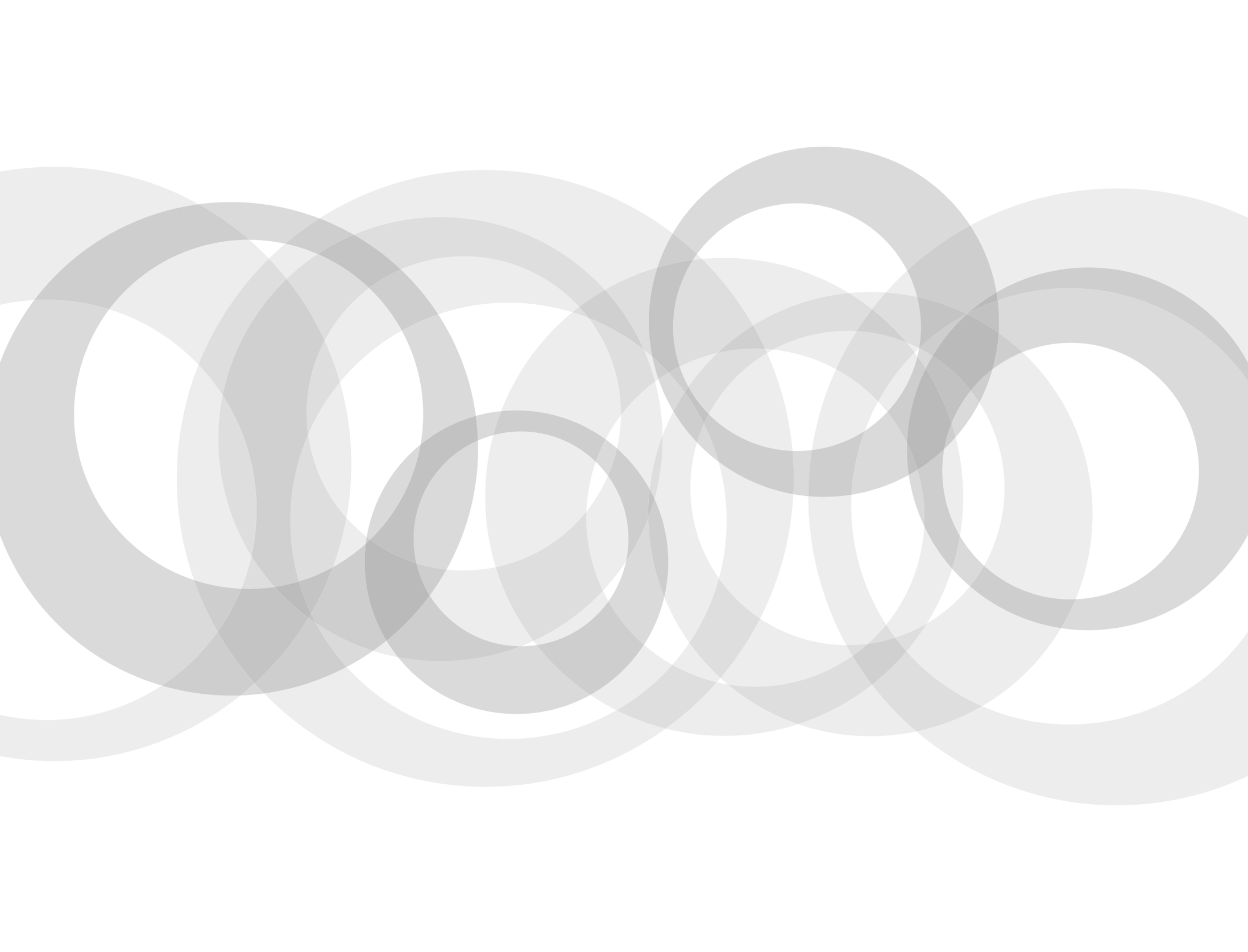
Conselho Nacional de Desenvolvimento Científico e Tecnológico- CNPq
[National Council for Scientific and Technological Development]

Sociedade Iberoamericana de Gráfica Digital- SIGraDi
[Iberoamerican Society of Digital Graphics]

Instituto de Arquitetura e Urbanismo, Universidade de São Paulo
[Institute of Architecture and Urbanism, University of São Paulo

ACKNOWLEDGMENTS

FAPESP
[Fundação de Amparo à Pesquisa Do Estado de São Paulo]
[São Paulo Research Foundation]



SIGRADI2018
TECHNOPOLITICAS

SIGraDi

instituto de arquitetura e urbanismo usp são carlos

USP

FAPESP

CAPES