Master in Design for Emergent Futures
INNOVATION IS NOT AN OPTION, IT IS A NECESSITY
MASTER IN DESIGN FOR EMERGENT FUTURES

2019/2020

Directed by: Tomas Diez / Oscar Tomíco

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The Master in Design for Emergent Futures is a next generation educational design programme, focused on exploring new forms that respond to some of humanity’s biggest challenges. This feat is accomplished through the use of constructive criticism, novel design methods, and advanced technologies. Taught in Barcelona, the European capital of social innovation and urbanism, the focus of this innovative programme aims to address climate change, urban sustainability, disenfranchisement, and social exclusion through the lens of critical and speculative design and technological exploration. The course will inspire, inform and critique design interventions in the real world by harnessing the potential of digital fabrication, artificial intelligence, synthetic biology, and blockchain to scale up the impact of small actions to address systemic defects of our current socio-economic paradigms. In this sense, the MDEF program aims to dissolve wicked problems, instead of solving them with one-shot solutions. All the while contributing learning outcomes, innovative forms of design, and positive social impact.

The MDEF program is made possible thanks to a unique collaboration between the Institute for Advanced Architecture of Catalonia and ELISAVA School of Design and Engineering, in collaboration with the Fab Academy and the Academy of Almost Anything, as well as other partners such as Space10, Kickstarter, Seeed Studio, among others to be announced soon.
We live in a time of rapid change, wherein new economic, environmental and social paradigms are challenging the status quo of the 150 year old industrial society. The biosphere, financial markets, family structures, business models in product development, and society in general are being challenged in one of the most important transition periods of human history. While the Industrial Revolution produced innumerable benefits to society, we are now confronted with a plethora of complex and interconnected problems that challenge our productive model: climate change, social disenfranchisement, and the centralisation of wealth and power. Cedric Price once asked: “Technology is the answer, but what was the question?” This is the moment for us to formulate new questions surrounding redefining the role of technology in society in a way that creates promising and viable emergent futures where humanity can thrive, rather than merely survive.

The ongoing transformations in the industry, under a new production paradigm supported by advanced manufacturing, new forms of synthetic intelligence, new material science or connected systems, are opening endless opportunities to recalibrate the negative effects of the human-centred activities on planet earth. Some of these emergent technologies, such as digital fabrication, synthetic biology, artificial intelligence, and blockchain, to name a few, are already disrupting the established mechanisms under which our productive model operates, and are producing massive cultural transformations in society. If the machine era aimed to shape the human habitat by creating interfaces with natural resources through science and technology, the ubiquitous nature of digital technologies will demand articulation and rapid synchronization of systems at different scales, both biological and synthetic. At the same time, the emergence of such new tools and technologies are demanding us to create different outputs from the ones we already know, and to design possible futures for life (human and non-human) on this planet.

The complexity of the current transition period usually leads to the creation of wicked problems, or problems without solutions, which need to be addressed from a multidisciplinary and collaborative perspective. Our approach is not to look for moon shots. Instead, we are proposing small scale interventions to approach large scale challenges in order to dissolve wicked problems with single solutions. This is why we are establishing a strong collaboration between one of the world’s leading institutions in technology and experimentation, like IAAC, with one of the best Design and Engineering schools in the world, together with the larger distributed educational program, and one of the emergent disruptive companies of Barcelona and Europe. The Master in Design for Emergent Futures embeds its philosophy and methodology in its own structure and mechanisms of function by engaging students in a personal and collective journey towards the creation of emergent futures, the path to make them happen, and to acquire the skills to envision, understand and test them in the real world.
Graduates of this Master will have a wide and informed vision of the impact of technology in businesses, education, society and culture, and will be prototyping and testing some of these technologies in the studios (research, design and development). During the master, a series of potential collaborations with industry, government and other professional sectors will be encouraged in order to develop more impactful projects. IAAC and Fab Lab Barcelona have collaborated with the following organisations: Nike, IKEA, Airbus, Festool, Ajuntament de Barcelona, UN-Habitat and others. ELISAVA has collaborated with companies like Agbar, Cisco Systems, Hewlett Packard, DUPONT, SUEZ, SEAT, Yamaha, among others.

The MDEF programme is recommended for designers, sociologists, computer scientists, economists, anthropologists, technology entrepreneurs and changemakers who are looking to develop an interdisciplinary and hybrid career path to conceive and produce impactful ideas to transform the established order. This Master has a high component of hands-on learning and project-based learning where students will be requested to turn big ideas into design strategies, prototypes and interventions to be tested in the real world, focused in Barcelona but connected globally with other cities.

The Master in Design for Emergent Futures is organised by the Institute for Advanced Architecture of Catalonia and ELISAVA Barcelona School of Design and Engineering, in collaboration with the Fab Academy and the Academy of Almost Anything.
The Institute for Advanced Architecture of Catalonia (IAAC) is a center for research, education, production and outreach, with the mission of envisioning the future habitat of our society and building it in the present. IAAC follows the digital revolution at all scales (from bits to geography, from microcontrollers to cities, from materials to the territory) to expand the boundaries of architecture and design and meet the challenges faced by humanity. IAAC is an experimental and experiential centre where one learns by doing, through a test methodology that promotes real solutions. IAAC is open, independent and radical; inspired by the values of Barcelona, the capital of architecture and design, where urbanism was invented, and where a local high quality and innovation-oriented research is connected to an international network of excellence in technology, design and society fields.

ELISAVA Barcelona School of Design and Engineering

ELISAVA delves into practical work and stimulates critical reflection among its students so they finish their studies with the ability to answer the needs of an evolving society. Described as inspiring, multidisciplinary, a knowledge-generator and trendsetter, our centre trains professionals who challenge the future.

Seeed Studio is a platform for global creative technologists to turn ideas into products, by providing open technology and agile manufacturing. Seeed’s IoT Hardware Innovation Lab (x.factory) situated in the heart of Shenzhen, China, serves as an IoT hardware lab for developers with prototyping tools and equipment, as well as a community of tech partners. The x.factory is operated by Chaihuo Maker Space, Shenzhen’s first and leading maker space since 2011, and it is the headquarter of Seeed Studio. It’s an “open factory” with production-level equipment for in-house prototyping and small-batch production services, as well as co-working spaces to make projects. The x.factory helps members to connect to Shenzhen’s vast resources in supply chain, as well as industry and market opportunities in China.

Kickstarter is a funding platform for creative projects. Everything from films, games, and music to art, design, and technology. Kickstarter is full of ambitious, innovative, and imaginative ideas that are brought to life through the direct support of others. Kickstarter helps artists, musicians, filmmakers, designers, and other creators find the resources and support they need to make their ideas a reality. To date, tens of thousands of creative projects - big and small - have come to life with the support of the Kickstarter community. Kickstarter is an enormous global community built around creativity and creative projects. Over 10 million people, from every continent on earth, have backed a Kickstarter project.

Space 10 in Copenhagen is a research hub and exhibition space initiated by the Swedish furniture company IKEA. The innovation lab explores how different approaches and trends might influence home design and the future of living. Focused on sustainability and responsible business models the hub has been operating since 2015. SPACE10 integrates four different labs that conduct research on important topics that might change the way people live in the future: “The Farm”, “Do you speak human?”, “Possible Cities” and “Build with Spaces”, which are connected through a digital platform and an international co-creation tool.

The Academy is a new global educational structure that offers high level education all over the globe at connected sites, offering the same educational structure that offers high level education in over 100 institutions around the world. The Academy is open to all members to connect to Shenzhen’s vast resources in supply chain, as well as industry and market opportunities in China.

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The MDEF Master programme is recommended for designers, sociologists, computer scientists, economists, anthropologists, urbanists, technology entrepreneurs and changemakers who are looking for a hybrid career path to conceive and produce impactful ideas to transform the world in multiple scales. This Master has a high component of hands-on learning and project-based learning where students will be requested to transform big ideas into design strategies, prototypes and interventions to be tested in the real world, focused on Barcelona but connected globally with other cities.

Candidates for the Master in Design for Emergent Futures are professionals coming from Industrial Design, Product Design, Urban Design, Graphic Design, Interaction Design, Computer Science, Engineering (Mechanical, Chemical, Product, Material), Sociology, Anthropology, Urbanism, Economy, and other related professions.

Upon successful completion of the Master, the students will join the IAAC Institute for Advanced Architecture of Catalonia and ELISAVA Barcelona School of Design and Engineering Alumni Communities. The IAAC Alumni Community is an active and dynamic network of visionary professionals spread around the world, promoting principles and applications of digital fabrication, design and architecture, exploring new academic and research initiatives, leading award winning practices or working for internationally acclaimed firms and institutions. ELISAVA alumni has the mission of promoting the constant personal and professional development of ELISAVA Barcelona School of Design and Engineering former students. For this reason, it is built as a participative space open to diversity, and orientated towards motivating leadership, cooperation, and entrepreneurship through strategic values such as design and technology, with the purpose of giving answers to the society’s current needs.
The Master in Design for Emergent Futures is organized in three terms (Oct-Dec | Jan-Mar | Apr-Jun), each including Design Studios, a Research Trip, complementary Seminars and related events.

The Design Studios are the main part of the program as they focus on real world experimentation and socio-technical development. During the year, students will be developing technical, aesthetic and conceptual skills by working on real-life scenarios. Seminar sessions are designed to delve into specific domains of knowledge and are delivered by relevant experts, including both practitioners and scholars. Throughout the academic year, international experts in the field of design and emergent technologies will be contributing to the program as guest lecturers.

In this Master, we won’t teach students a methodology nor a set of golden rules to be applied in given assignments. Instead, we will introduce the MDEF as a journey and exploration on how projects be manifestos to introduce new outputs. We would like to support students in the development of their identity and vision, and will encourage them to grow their unique set of skills, knowledge and attitude in order to navigate through the uncertainty inherent when designing possible futures.

The Master in Design for Emergent Futures is a journey through time and multiple dimensions, which when intersected, opens a new point of view, understanding and translating ideas into projects. These four dimensions are:

- **EXPLORATION:** We will expose the students to a set of technologies that have the capacity to disrupt our present understanding of society, industry and the economy.
- **INSTRUMENTATION:** We will provide a set of skills and tools that will help to translate ideas into prototypes, and prototypes into products, which can then be tested and iterated throughout the design process.
- **REFLECTION:** We will support the students in the development of their identity and skill set, knowledge and attitude as designers of possible futures.
- **APPLICATION:** We will encourage students to create a culture of making where prototyping acts as a generator of knowledge, and interventions become message carriers of a future that is about to come.

The Master in Design for Emergent Futures is connected with the Exploring Emergent Futures platform at the Royal College of Art, London, which has been developed by James Tooze and Tomas Diez from 2015. And is now led by James and Elizabeth Corbin.
First Year
October to June

TERM 1
UNDERSTAND HOW TO DESIGN FOR EMERGENT FUTURES

- Exploration: Data and Information in the Digital Age
- Reflection: Design Identities and Methods
- Instrumentation: Introduction to Digital Fabrication
- Application: Research Studio
  Identify and Analyze

TERM 2
ENVISION EMERGENT CONTEXTS

- Exploration: Emergent Technologies
- Reflection: Emergent Design Trends
- Instrumentation: How to Make Almost Anything
  Fab Academy

TERM 3
CREATE FUTURE SPECULATIONS

- Exploration: Future Business Models
- Reflection: Speculative Design Futures

The following programme refers to the Academic Year 2019-2020. The programme for the Academic Year 2020-2021 may be subject to slight variations.
PROGRAMME STRUCTURE

First Year October to June

TERM 1 / 25 ECTS

TERM 2 / 25 ECTS

TERM 3 / 25 ECTS
PROGRAMME STRUCTURE

First & Second Year

YEAR 1
1. UNDERSTAND
   - Landing in the MDF program Pre-course and TERM 1
   - Seminars: Definition of areas of interest and intervention.

YEAR 2
2. DEVELOP AND TEST
   - Diving into MDF: Acquiring design and prototyping skills.
   - Testing and Speculating with possible scenarios.

3. REFINE AND LAUNCH
   - YEAR 2: Incubation and acceleration. Final project with the support of MDF Partners.
   - Scaling and distribution.
MASTER IN DESIGN FOR EMERGENT FUTURES
FIRST YEAR

TERM 1

UNDERSTAND HOW TO
DESIGN FOR EMERGENT FUTURES

Introductory courses and philosophical/theoretical background.

APPLICATION
Research studio: Establishing an area of interest, analysis and research. Definition of topic and direction of the final project.

REFLECTION
design identities and methods
A day in the life of hybrid designers from Barcelona. Building knowledge, skills and attitude as a designer.

INSTRUMENTATION
Introduction to digital fabrication, distributed manufacturing and Industry 4.0.

EXPLORATION
Data and information in the digital age
Communications, computation, change theory.
TERM 2

ENVISION EMERGENT CONTEXTS

January to March

Design for Emergent Futures Studio 2: Making possible future speculations.

APPLICATION

REFLECTION
Design approaches: Emergent Design trends, create your design identity and vision.

INSTRUMENTATION
Fab Academy (how to make almost anything): principles and practices, project management, computer-aided design, computer-controlled cutting, electronics production, 3D scanning and printing, electronics design, computer-controlled machining, embedded programming, mechanical design, output devices, machine design.

EXPLORATION
Emergent technologies: How Artificial Intelligence, Synthetic Biology, Digital Fabrication, Robotics are changing everything?

MARCH MID TERM REVIEW
TERM 3
INTERVENE, CREATE
FUTURE SPECULATIONS

April to June

Design for Emergent Futures Studio 3: Making future speculations possible.

APPLICATION
Design Studio: Project oriented. Interventions in the reality. Applied research

REFLECTION
Materialising possible speculations: Roles of prototyping, from demos to research products.

INSTRUMENTATION
Fab Academy (how to make almost anything): molding and casting, input devices, composites, networking and communications, interface and application programming, applications and implications, invention, intellectual property, and income.

EXPLORATION
Future business models: Crowdfunding and crowdsourcing, open source business models, cryptocurrencies and cryptomarkets.

JUNE PROJECT DEVELOPMENT & FINAL PRESENTATION
The Master in Design for Emergent Futures is offering for IAAC, and Fab Academy students, the possibility to extend their studies and project development in a second-year program, to be held in Barcelona, Spain. The MDEF second year will allow students to continue their research agenda under an acceleration model of development, which will be focused in turning final projects of a Master program into living platforms for research, business development, or impact generation.

MDEF’s first-year students have the opportunity to understand, develop, prototype and test new ideas on how design and technology are able to generate different outputs in any given reality. Alongside with a deep dive into the main questions about the role of technology and design have to transform and address the world’s main challenges, the MDEF program offers students the opportunity to acquire new skills in the field of digital fabrication, biology, artificial intelligence, distributed ledger technologies, and computer science. Such knowledge is applied into a final project, developed by each student during the second and third terms.

**WHO CAN APPLY?**

Master students that have completed the MDEF program in Barcelona. A student applies to continue their first-year research and project development. In some cases, students might reframe their project approach, depending on the partnerships to be developed within the program’s second year.

**FUNDING**

- Funding for students developing their own research interest:
  - Paid by student
  - Paid by a company/organization
  - Paid by the hosting institution or lab
- Funding for students applying for a given (and paid) subject by a third party:
  - By a company/organization
  - By the lab

NOTE: students will be encouraged and supported by MDEF to apply for grants given by organizations, companies, or international programs.

**SELECTION PROCESS**

MDEF reserves the right to accept or decline applications from students, based on the following principles:
- The research area of interest
- Ethics and social impact of the project
- The context of the project’s application
- Potential conflict of interests
SECOND YEAR

PROGRAMME STRUCTURE

The program is executed in three terms:

TERM 1: PROJECT GROWTH PLAN (ALPHA)
- Identifying needs
- Definition of project’s horizons and milestones
- Market analysis and value proposition
- Execution plan
- Definition of partnerships and funding opportunities

TERM 2: IMMERSION (BETA)
- Residency with partners (Shenzhen, Copenhagen, and others TBC)
- Design from manufacturing
- Engineering sample/first release

TERM 3: WRITING AND FINALIZING (V.1)
- The student or group will learn how to write about the product
- The product is finalized to the market
- Small batch/project deployment

NOTE: The organization of the terms if subjected to changes according to partners availability to host researchers

OUTCOMES

Students gain multiple exits for their professional career and their project. A common outcome for the student will be the expansion of their international networks, with a focus in Europe and China. MDEF has identified three potential outputs:

BUSINESS
- Distributed fabrication
- Mass production
- Result: product to market

SOCIAL
- Open access
- Quality of life
- Result: project deployment in a specific context

ACADEMIC
- Master degree. ECTS credits
- Research development
- Result: contributions to a specific field of knowledge

EXECUTION

Every week or every second week, we have a global meeting for global review, lesson by an expert, weekly exercise to deepen the knowledge and matchmaking with the collaborators. Students work together, with mentors and companies the rest of the time to fulfill weekly tasks and work on the prototype. The idea is to work on the prototype every week of the program except maybe last few weeks if it’s already done.

OUTPUTS

During the second year of the MDEF program, students are expected to produce:
- Project prototype (physical and/or digital)
- Project web presence
- Repository in a version control system (GitLab, Github, etc)
- Public website
- Research paper with the key learning of the process and results of the project
- Video explanation of the project
### MDEF in Brief

<table>
<thead>
<tr>
<th>EDITION</th>
<th>2nd edition</th>
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<tbody>
<tr>
<td>DIRECTORS:</td>
<td>Tomás Diez, Oscar Tomico</td>
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<tr>
<td>DEGREE:</td>
<td>Master in Design for Emergent Futures</td>
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<td>CREDITS:</td>
<td>75 ECTS*</td>
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<tr>
<td>DURATION:</td>
<td>9 months from October 2019 to June 2020</td>
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<td>MODALITY:</td>
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<td>LANGUAGE:</td>
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<td>LOCATION:</td>
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<td>TUITION FEES:</td>
<td>Non EU students: 16,000 €</td>
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<td></td>
<td>EU students: 12,800 €</td>
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*(pending accreditation)

Check more details in the web site

https://iaac.net/educational-programmes/master-design-emergent-futures/
In 2014, the then mayor of Barcelona challenged cities to produce everything they consume by 2054. Fab City Global Initiative is enabling this shift away from the industrial paradigm of Product-in Trash-out, by enabling the return of manufacture to cities supported by a Data-in Data-out urban model. It comprises a Network of 28 cities, a core Collective and in 2018 established its governance structure with IAAC as a Founding Member, the Fab City Foundation.

Fab City believes sustainability and livability depend on collective action and co-designed solutions, which benefit the planet and the future of humanity. Its values and vision as a community of practice are manifested through ten guiding principles, ‘The Fab City Manifesto’.

Fab City applies its vision and values in a full stack model. From the local to the global, it works across multiple layers of practice and deployment, scaling the FabLab approach to a city and systems level.

The Global Initiative engages in action-research directly in the city by prototyping and deploying strategies across localities in its network, where cities are connected through the knowledge they share across common tools and platforms.

Findings from prototyping and action-research are documented and shared within the network.
Fabricademy is a transdisciplinary course that focuses on the development of new technologies applied in the textile industry, in its broad range of applications, from the fashion industry and the upcoming wearable market. The two phase program will last 6 months, with approximately 3 months of seminars and learning modules and three months focused on individual in-depth applied project research.

Through the program, Fabricademy is developing and implementing a new approach on how to create, produce and distribute textile and fashion elements by using distributed manufacturing infrastructures and knowledge networks. Along with experts from the field, the participants investigate how the textile and fashion industry can benefit from new technologies, processes and business models.

Students experiment with the human body, culture and mindset by recycling, hacking and sensing it, creating feedback loops with project development, where materials, aesthetics, sustainability and customization play equal and important roles. The Academy offers a cross-disciplinary education and research platform, where production and culture through advanced technologies are making an impact in the way we think and act towards the textile industry and all of its applicable fields. This platform operates by the mentality of Working locally, while creating connected communities globally.

Poblenou Maker District is a pilot project for digital social innovation that aims to foster a mixed community of workshops, maker spaces, fab labs, universities, research institutions, restaurants, companies and active social movements present in the neighbourhood and which encourage new values for Barcelona: the values of a city that is open in terms of collaboration, democracy, production, innovation and creation. The Maker District aims to generate a new narrative that goes beyond 22@, the innovation district based on the knowledge economy, and contribute to the development of products, services and interventions generated by the Maker Movement and small-scale citizen initiatives, in order to share them with a global community.

The initiative will help promote the creation of activities and projects that foster interaction within the local community and strengthen reindustrialization processes in the urban fabric with added-value features, such as the use of cutting-edge technologies for local production, training workers to face new challenges in the workplace in the immediate future and fostering Industry 4.0.

Poblenou Maker District is based on an international perspective of the “Fab City”, the construction of a new model for cities that makes it possible to reduce their environmental and social footprint through the local production of food, energy and products, and the worldwide exchange of knowledge using the power of the Maker Movement and the global Fab-Lab network. Barcelona is the world leader in this project.
Smart Citizen is a platform to generate participatory processes of people in the cities. Connecting data, people and knowledge, the objective of the platform is to serve as a node for building productive and open indicators, and distributed tools, and thereafter the collective construction of the city for its own inhabitants.

The Smart Citizen project is based on geolocation, the Internet and free hardware and software for data collection and sharing. It connects people with their environment and their city to create more effective and optimized relationships between resources, technology, communities, services and events in the urban environment.

The project is born within Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia, both focused centres on the impact of new technologies at different scales of human habitat, from the bits to geography. The project was made possible thanks to the collaboration and active support of MID.
Aquapioneers is an open source project born at the Green Fab Lab, from a combination of Guillaume Teyssié’s open source aquaponic project during the FabAcademy 2016 and Loïc Legoueff’s master thesis in Aquaponics at Universidad Autonoma de Barcelona. Guillaume Teyssié and Loïc Legoueff are the founders of Aquapioneers, an initiative that will contribute to the growing urban farming movement in Barcelona. They envision a future where Barcelona’s citizens obtain most of their food from local farmers, from their rooftops, and from inside their own homes.

They are committed to change the future of food, and they are proud to start with the Aquapioneers Ecosystem. This cultivation technique is called Aquaponics and reduces water consumption by up to 90% compared to conventional agriculture.

For more information visit: http://aquapioneers.io

The Open Source Beehives project is a network of citizen scientists tracking bee decline. We use sensor enhanced beehives and data science to study honeybee colonies throughout the world. All of our technology and methods, from the hive and sensor kit designs to the data, are documented and made openly available for anyone to use.

The primary goal is to determine the cause(s) of bee decline, to identify potential solutions, and to encourage networks of concerned citizens to study and redress the issue through the use of digital technologies in fabrication and information. The project is founded on the belief that open source innovation is the most direct way to address our global problems, and therefore, the software, hardware, data, and methodologies used by it are the perpetual property of the public domain.
Making Sense shows how open source software, open source hardware, digital maker practices and open design can be effectively used by local communities to appropriate their own technological sensing tools, make sense of their environments and address pressing environmental problems in air, water, soil and sound pollution.

The Institute of Advanced Architecture of Catalonia (IAAC) was among the partners of the European project Making Sense, developed within the framework of Horizon 2020 Programme. IAAC worked with local communities in Barcelona to develop new strategies to empower citizens with technology to tackle environmental issues primarily using the Smart Citizen platform. IAAC also lead the overall project design and communication strategy.

To achieve this, the project develops a Making Sense Toolkit based on the Smart Citizen platform for bottom up citizen science, developed at Fab Lab Barcelona. The toolkit will be tested in pilots in Amsterdam, Barcelona and Pristina, aimed at deepening our understanding on the processes enabling collective awareness. Based on the pilots, we will develop a conceptual and methodological framework for participatory environmental maker practices. It will show how to provide citizens and communities with appropriate tools to enhance their everyday environmental awareness, to enable active intervention in their surroundings, and to change their individual and collective practices.

IAAC, in partnership with the University of Plymouth and ENSCI Les Ateliers, was the coordinator of the Made@EU project, launched within the framework of the Creative Europe Programme. Technologies such as 3D printing and scanning have recently opened new development and innovation opportunities for the creative sectors. This phenomenon, described as the third industrial revolution, is expected to radically change the production and distribution status quo and strongly influence society as a whole, from a cultural, social and economic point of view.

However, in order to fully unleash design’s potential as a driver for growth and innovation, a number of remaining barriers have to be lowered in the fields of education and training linked to the use of digital fabrication technologies amongst European creatives.

Made@EU aims to bridge the “digital divide” that currently hinders the widespread use of digital fabrication knowledge and technologies in the European culture, especially in the field of design, arts and crafts.
The Institute for Advanced Architecture of Catalonia coordinates the EU project Robotics for Microfarms (ROMI) under the framework H2020. IAAC is part of a consortium formed by a team of interdisciplinary experts in computer science (Inria, Sony), robotics and electronics (UBER, Sony, IAAC), plant modelling and agronomy (CNRS, Inria), as well as microfarming (Châtelain) which will be in charge of developing ROMI initiative, an open, lightweight robotics platform for small farming land areas.

By implementing robotics in farmlands, ROMI will assist in weed reduction and crop monitoring and it also will help in reducing manual labour, saving farmers a 25% of their time. The technology applied in this project will acquire detailed information on sample plants and will be coupled with a drone, developed by Noumena, that acquires more global information at crop level.

Robotics for Microfarms will produce an integrated, multi-scale picture of the crop development that will help the farmer monitor the crops to increase efficient harvesting. This project aims to adapt and extend state-of-the-art land-based and air-borne monitoring tools to handle small fields with complex layouts and mixed crops. IAAC in collaboration with an international consortium will develop and bring to the market an affordable, multi-purpose, land-based robot, integrated 3D plant analysis in the robot for detailed plant monitoring, an aerial NERO drone for multi-scale crop monitoring and test the effectiveness of this solution in real-world field conditions.

Since 2013 Fab City Research Lab at the Institute for Advanced Architecture of Catalonia has developed platforms such as Fablabs.io, the online social network and official platform of the global Fab Lab Network, where Fab Labs are mapped, knowledge is shared, projects are developed and where the community discuss these topics. After this successful initiative, the Creative Europe Programme has contributed to further consolidate this project which now wants to step forward and focus on building a Distributed Design Market (DDM) platform across Europe for makers and designers based on the fablabs network idea.

The DDMP platform aims to strengthen a creative community of more than 10,000 registered users who are fabricators, artists, scientists, engineers, educators, students, amateurs, professionals, ages 5 to 75+, located in more than 40 countries in more than 1000 Fab Labs. The Platform aims at promoting and improving the connection of makers and designers with the market (Maker to Market).

Its main objectives are to foster the development and recognition of emerging European Maker and Design culture by supporting makers, their mobility and circulation of their work, providing them with international opportunities and highlighting the most outstanding talent; improve the connections among makers, designers and the market, providing thus tools, strategies, guides, contents, education; events, networks in order to enable them to commercialize their creations; stimulate and develop a genuine Europe-wide programming of Maker activities in order to contribute to the development of a vibrant and diverse European Maker and Design culture that can be experienced by a broad range of audience across Europe and beyond.
Tomas Diez is a Venezuela-born Urbanist specialized in digital fabrication and its implications in the future of cities. He is the director of Fab Lab Barcelona at the Institute for Advanced Architecture of Catalonia, the Fab Academy global coordinator, and the European project manager of the Fab Foundation. He holds a Bachelor degree in Urban Planning and Sociology by the University Simon Bolivar (Caracas – Venezuela), a Diploma in social work at the University of La Havana (Cuba), a Master in Advanced Architecture by IAAC, and a Diploma on Digital Fabrication in a pilot programme on the class “How to Make Almost Anything”, offered by MIT Center for Bits and Atoms in 2008 as the year zero of the Fab Academy. He works as a close collaborator in the development of the Fab Lab Network together with MIT and the Fab Foundation. He is a tutor in Design at the Royal College of Arts in London; co-founder of the Smart Citizen project and StudioP52 both in Barcelona, and has been the co-chair of the FAB10 Barcelona, the 10th international fab lab conference and annual meeting hosted by IAAC in 2014. Tomas has been appointed by The Guardian and Nesta as one of the top 10 digital social innovators to watch in 2013, and has been awarded by the Catalan ICT association as the entrepreneur of the year in 2014-15. His research interests relate to the use of digital fabrication tools to transform the reality, and how the use of new technologies can change the way people consume, produce and relate with each other in cities.

Dr. Oscar Tomico is head of the Design Engineering Bachelor program at ELISAVA Design and Engineering school, and Assistant Professor at Industrial Design, Eindhoven University of Technology, working on soft interactions for the Wearable Senses Lab. Current projects focus on the textile industry and involve stakeholders during the design process to create ultra-personalized smart textile services in the form of soft wearables. He is involved in research projects like ArchInTexETN (2015), CLICKNL Crafting Wearables (2013), CRISP Smart Textile Services (2011). He has been a guest researcher and lecturer at Textile and design lab AUT (NZ), TaiwanTech (Taiwan), Swedish School of Textiles (Sweden), IAAC (Spain), and Aalto (Finland). He co-organized events like the Waag Careful Designs and Hypercrafting Fashion events (Amsterdam), Baltan Open Lab: Wearable Senses workshops (Eindhoven), Crafting Wearables (Arnhem) and DHUB Smart services, smart production, smart textiles (Barcelona). He curated exhibitions like “Systems Design - Eindhoven School” (DHUB, Barcelona), and “Smart Textiles Wearable Services” (TextielMuseum, Tilburg).
Guillem Camprodon is an interaction designer with a long experience working on projects between the Internet of Things and Digital Fabrication. His broad knowledge of internet technologies and hardware development among his training as a designer makes him an expert on developing projects involving emergent technologies with communities.

Since 2010 he holds a research position at the Institute for Advanced Architecture of Catalonia (IAAC) and Fab Lab Barcelona where he currently leads the development of Smart Citizen, a global open-source environmental monitoring platform. He is also a regular advisor on many projects as a tangible interaction expert and teaches regular workshops on open-source software and hardware.

Victor Barberán is an Industrial Designer with more than 20 years experience in developing custom technology for multidisciplinary art and science projects. Throughout his career, he worked in electronics design, software development, data analysis, modeling and animation, and digital postproduction.

He is currently part of the Fab Lab Barcelona team doing research and development within the Smart Citizen project and teaches at the Bachelor of Smart Design at the ESDI School of Design.

Ingi Guðjónsson is a product designer and project manager at Fab City Research Laboratory and IAAC Fab Lab Barcelona, a centre of production, investigation and education since 2014. From day to day he works with external clients on a wide range of projects, as well as managing and teaching workshops for public and private clients. With great passion for open and circular economy Ingi is the creator of market.fablabs.io and a collaborator of the Distributed Design Market, a new open-source catalogue/platform of products made for distributed manufacturing. He runs Sudio Design Company a creative studio and co-working space in Poblenou, Barcelona. In Iceland he studied music and arts from early age and moved to Barcelona for his Bachelor degree in product design at The European institute of design from 2011-2015. He has been awarded for his work at „Design for change 2016 (Lille, France)”, Ableton award 2015 (Music hackathon - Sonar BCN)” Torg í biðstöðu 2014 (Reykjavík).

Anastasia Pistofidou is a Greek architect dedicated in digital fabrication technologies, design and education. She has a Master degree from the Institute for Advanced Architecture of Catalonia 2010–2011 with a specialization in Digital tectonics and a Bachelor Degree from the Aristotle University of Thessaloniki, department of Architecture in 2008. She currently works at the Institute for Advanced Architecture of Catalonia (IAAC) and Fab Lab Barcelona as the director of the FabTextiles and Materials research department. In 2017 she founded the textile-academy, an international peer based course that combines textiles, soft fabrication and biology. Its scope is to prescribe She combines the analog and the digital towards applied research focused on new materials, art and textiles.
Jonathan has been the coordinator of the Green Fab Lab at Valldaura Labs, IAAC Campus in Barcelona since 2013 and is currently the Project Manager of an EU Horizon 2020 for Robotics and Agriculture. He has studied and taught in the Fab Academy, Bio Academy and setup the Zero Series workshops in Biology, Agro Ecology and Forestry. He has co-founded the Open Lab platform for technology transfer and the Open Source Beehives project for sustainable beekeeping. Having attained a masters degree MSC in ‘International Cooperation, Sustainable Emergency Architecture’ — this field he has worked on housing and development projects alongside ‘Habitat for Humanity’ in Costa Rica, ‘UNESCO’ in Cuba and with ‘Basic Initiative’ in Tunisia. He has worked in conjunction with ‘Habitat’ in Barcelona and holds a particular interest in appropriate technology and local manufacturing. His writing on “Geographic referencing for Technology Transfer” was published in the book “Reflections on Development and Cooperation”.

Nuria is a post-doctoral researcher at Complex Systems Laboratory at Universitat Pompeu Fabra (UPF) in the PRBB. She holds a major in Biology and a engineering in informatics and performed her research thesis about Biocomputation, that it is at the interface of both fields. Nuria teaches biology for architects, artist and designers of IAAC, Elisava or Massana universities and is a founder member of the DIYBioBcn, the first biohacking group of Spain.

I started in the area of Artificial Intelligence. There, the work of Herbert Simon, made me shift my focus slowly from technology to organization and design. I explored the agent paradigm, and specifically I used agent-based social simulation to study the interplay between collaboration, innovation, networks and emergence. This opened up a whole world of interdisciplinary work. I have interacted with scholars and practitioners from very different disciplines, such as Economy, Sociology, Organizational Behaviour and Design. My present interests are mainly in the creation and study of innovation dynamics, collaboration, and the emergence of collaborative design networks. I am focusing my research on how groups can design together new interaction systems for spawning new design processes, what some call research in metadesign.

Prof. Neil Gershenfeld is the Director of MIT’s Center for Bits and Atoms. His unique laboratory is breaking down boundaries between the digital and physical worlds, from creating molecular quantum computers to virtuosic musical instruments. Technology from his lab has been seen and used in settings including New York’s Museum of Modern Art and rural Indian villages, the White House and the World Economic Forum, inner-city community centres and automobile safety systems, Las Vegas shows and Sami herds. He is the author of numerous technical publications, patents, and books including Fab, When Things Start To Think, The Nature of Mathematical Modeling, and The Physics of Information Technology, and has been featured in media such as The New York Times, The Economist, and the McNeil/Lehrer News Hour.

He is a Fellow of the American Physical Society, has been named one of Scientific American’s 50 leaders in science and technology, has been selected as a CNN/Time/Fortune Principal Voice, and by Prospect/FP as one of the top 100 public intellectuals. Dr Gershenfeld has a BA in Physics with High Honours and an honorary Doctor of Science from Swarthmore College, a PhD in Applied Physics from Cornell University, was a Junior Fellow of the Harvard University Society of Fellows, and a member of the research staff at Bell Labs. He is the originator of the growing global network of field fab labs that provide widespread access to prototype tools for personal fabrication and directs the Fab Academy, the associated programme for distributed research and education in the principles and practices of digital fabrication.
Strategic Innovation consultant and researcher specialised on social and cultural trends scanning and its appliance on business and innovation, and futures/Strategic Foresight. She is one of the Becoming studio co-founders, and currently the Project Leader of Govup at Kreab. Also is developing the platform project known as Postfuturear, on Futures Studies research and dissemination for spanish different audiences. She has worked as a trends and offline user experience analyst, and innovation researcher for creative agencies, universities (IGOP-UAB, IN3-UOC), and public institutions. Also as cultural curator and project manager for the Barcelona Mini Maker Faire 2014. She is lecturer occasionally in different educative institutions as IED Barcelona, Universitat de Barcelona, BAU Escola de Disseny, among others, and had collaborated in different media, from CCCBLab to RNE4.

Santiago Fuentemilla Garriga (male), with Master of Architecture from the University of la Salle Universitat Ramon Llull, Spain, as a specialist in Architectural Design and Construction. In 2012 he graduated from the Fab Academy Diploma at FabLab BCN, a digital fabrication and rapid prototyping course directed by Neil Gershenfeld at MIT’s Center For Bits and Atoms (CBA). As a professional, Santiago has worked in various architectural firms carrying out projects at the international level in the last 10 years. He is currently leading the design director at OPR (Other people’s Rooms) in Barcelona, a multidisciplinary studio based on architectural concept design for enhanced user experiences. Since 2013 he has been a part of the FabLab BCN team, participating in a diversity of educational and professional ventures. Santiago is current Fab Academy Instructor and member of the Future Learning Unit team at Fab Lab Barcelona based on the design and creation of active learning experiences with digital fabrication tools.

More info: www.santiagofuentemilla.com

Xavier Dominguez Aparicio, with Multimedia Engineering Degree from the University of la Salle Universitat Ramon Llull, Spain. In 2016 he graduated from the Fab Academy Diploma at FabLab BCN, a digital fabrication and rapid prototyping course directed by Neil Gershenfeld at MIT’s Center For Bits and Atoms (CBA). As a professional, Xavier is co-founder and Chief Technology Officer, Ambar VS, a company specialized in software development for the Healthcare industry based in Barcelona and Los Angeles (USA) since 2005. Since 2016 he has been a part of the Fab Lab BCN team, participating in a diversity of educational and professional ventures. Xavier is current Fab Academy Instructor and member of the Future Learning Unit team at Fab Lab Barcelona based on the design and creation of active learning experiences with digital fabrication tools.

More info: www.xavidominguez.com

Xavier is the co-creator of the POPUPLAB project (Mobile FabLab) aimed at disseminating the concept of digital manufacturing in our society: “Digital Fabrication Everywhere”. Xavier is current coordinator of the Future Learning Unit at Fab Lab Barcelona based on the design and creation of active learning experiences with digital fabrication tools and Fab Academy Guru.

Mette was born in Denmark in 1976 and grew up on a small farm in the forest, with ecological vegetables, discussions about windmills and lots of time for building tree-houses and dams in the stream. There was always a supply of clay, plaster, paint, wood, wool and other funny materials to play with.

As a teenager, Mette was part of different artistic groups and finally in 1996 she started at Kunsthalshøjskolen in Holbæk. Before moving Barcelona in 2000, Mette sailed and lived for a couple years on a small 40’ sailboat in the Caribbean, South America, North America and the Atlantic.

In Barcelona, She went back to university, first studying interior design in the Massana school, and afterwards the postgraduate DIA (design, image and architecture) at the Elisava School of Design. In 2004 Mette opened her first design studio. Apart from her work in the studio, She have been teaching at different schools of design and architecture.

More info: www.mettebakandersen.com

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More info: www.mettebakandersen.com
Mara is a Human Computer Interaction (HCI) researcher and a technology strategist. She is the CEO of Ideas for Change, a think tank and consultancy firm advising cities, businesses and institutions on innovation, open and collaborative strategies, civic tech, and exponential growth (see our frameworks @pentagrowth and @The Bristol approach). She is also a Senior Research Fellow at the Fab Lab Barcelona where she coordinates Making Sense, a European project that seeks to empower citizens through personal digital manufacturing applied to the design of environmental sensors. Mara earned a PhD in Computer Science from the Intel Collaborative Research Institute on Sustainable Connected Cities (ICRI-Cities) at University College London (UCL). She also holds a BA in Audiovisual Communications, a postgraduate diploma in Media Arts and a MSc in Cognitive Systems and Interactive Media.

Thomas Duggan is an inventor who has a love of nature, design, materials, architecture, science, advanced generative design, technology, craft and robotic fabrication. His work chronicles explorations into design, sculpture, site-specific installations, engineering, architecture, material science, traditional craftsmanship and research. He studied at Central St. Martins, London, UDK, Berlin and TUFTS, USA.

He is passionate about reconnecting people with the natural environment through design, art, bioengineering, architecture and sustainability. His work merges technical and functional to ethereal and mysterious. He has exhibited internationally at galleries such as the V&A London, Somerset House, London Design Festival, PS1, MoMA and the Salone Del Mobile. He has been collaborating with TUFTS, MIT, RCA, Harvard and Autodesk in recent years as well as developing his own practice.
MDEF Tuition for the year 2018/2019-20 is 16,000€ for Non EU students and 12,800€ for EU students. The selected candidates must send a scanned proof of a down payment of 2,500€ to the Institute to confirm participation, maximum 4 weeks after their acceptance. The remaining part of the tuition fee may be paid either in one or two installments, 60% before September 1st, 2018 and 40% before December 1st, 2018.

All payments of the selected programme must be paid by bank transfer only:

Bank: Santander
Agency: 6784
IBAN – ES55 0049 6784 3226 1615 5632
SWIFT – BSCHESMMXXX
Holder: Institut d’Arquitectura Avançada de Catalunya.
Address: Via Augusta, nº182 (Es 08021 Barcelona)

Note: Make sure that bank transferring SUBJECT is the applicant’s name, and not the person who orders the transfer. Also make sure to select the SWIFT instructions code “OUR” when ordering the bank transfer. This means that you have to pay the transfer charges.

To apply for IAAC, please fill out and submit the online applications form (www.iaac.net/iaac/apply) for the programmes: MAA01, MAA02, MaCT01, MaCT02, MAI, MAA01 + OTF, OTF, MAEB, MRAC, MDEF.

For the online application, the following required documents should all be submitted in English, with the exception of the undergraduate diploma (All documents must be uploaded onto the designated space on the online application form in PDF format).

A letter of intent expressing the reasons for which you wish to attend the chosen master – Written in English, PDF and with a maximum of two A4 pages.
Curriculum vitae
Portfolio, showing samples of your work – maximum of 10MB.
Two letters of recommendation (from professional or academic referees) – In English, PDF and with the corresponding referee contact information.
A copy of your highest academic degree. If you haven’t graduated and therefore your diploma is not available at the moment of your application, you will need to send a letter in English or Spanish emitted by your University acknowledging that you are currently studying (name of the programme) and will graduate in (specific date).
A copy of a valid passport (copy of valid I.D. is accepted for citizen of member states of the EU) *If you hold more than one passport bear in mind that the one you provide in the application form is the one IAAC will use for your acceptance letter and therefore the one you will use to apply for your Spanish visa (non EU students) and NIE (all students).

"Bear in mind that you can apply with a copy of your title but if you are accepted you will be required to send a legalised copy of your degree and an official SWORN translation of it in Spanish. More info about SWORN translation and legalisation in the “FAQ” section in IAAC’s website.

* If you have not yet graduated, but will be graduating before the commencement of the academic year to which you are applying at IAAC, you are still eligible to apply. However, to complete the application process, you will need to provide the document explained in the section 5 above.

If you have any questions or doubts with regards to the application process, please feel free to contact us at applications@iaac.net
The usual procedure IAAC uses for the collection and analysis of information to ensure the quality of the programme is the student surveys and evaluation reports. IAAC performs two different types of surveys: one survey is specific for each course, and is being made immediately after a course finishes, and the second survey is a general survey, which is conducted at the end of the academic year. Course Survey: The surveys contain questions related to course content and structure of the class, the methodology used and the level of facilities where the course has been conducted. There are also questions about the faculty, allowing the student to evaluate the faculty's communication capabilities, the capacity of synthesis and organise the content structure as well as the faculty's competence in assessing and explaining the results obtained. The survey also include questions about the relevance of the class with respect to the students own interests and the relevance with the general research agenda of the Master programme. Students are also asked within this survey to suggest improvements in the courses that IAAC takes into consideration for the future editions. General Survey: The general annual survey refers to the overall management of the programme and the efficiency of the entire organisation. It includes questions of whether students had difficulties in the application and admission process, whether they had problems in acquiring all necessary certificates and/or other documents and more. It also includes question of satisfaction in relation with the efficiency level of IAAC staff, whether faculty and content have met their expectations, and whether they were satisfied with the level of access to facilities and material resources at the Institute. Also, students are asked what course or activities considered more interesting and relevant to the programme and they are also asked to express ideas for overall improvement.

Class attendance is obligatory for studios and seminars. In both cases, courses are graded as follows:
- 0-4.9 Fail (this means that the student is not going to get his/her Master’s Degree, this grade will be justified and well explained)
- 5.0-6.9 Passed
- 7.0-8.9 Good
- 9.0-10 Excellent/Distinction

- Under no circumstances will students be excused from presenting their design work at the final review of a project.
- Diplomas will not be delivered to students with any incomplete in their final grades.

In addition to the above, Midterm Reviews will be held with the members of the faculty in order to inform each student briefly of the general feelings of the faculty about his or her work. Suggestions may be given on how to prepare for the Final Review.

Study-related expenses such as the purchase of books, graphic reproduction, printing and model making are not included in the tuition fee. For field trips and excursions an individual financial contribution may be required.

Non European students accepted to the programme are advised to contact the nearest Spanish Embassy to start the Visa procedure. Be aware that the application procedure for a Student Visa can take up to 3 months.

Students are expected to bring their own laptop computer no more than two years old, with the following specifications: PIV at 2.4 Ghz (or similar in the case of an AMD processor).
- 8 Gb RAM.
- WIFI internet connection.
- 1280 x 1024 screen display resolution

Participants are responsible for their own health insurance and other personal insurance. It is mandatory to acquire a Medical Insurance to cover your stay here in Barcelona. The Catalan Public Health System does not cover students, and will charge you for any visit or consultation. Please note that the IAAC is not liable for loss or damage to personal belongings.
The Institute for Advanced Architecture of Catalonia – IAAC is an international centre for Education, Fabrication and Research dedicated to the development of architecture capable of meeting the worldwide challenges in constructing 21st century habitability.

Based in the 22@ district of Barcelona, one of the world’s capitals of architecture and urbanism, as well as the European Capital for Innovation (2014), IAAC is a platform for the exchange of knowledge with researchers, faculty and students from over 60 countries around the world.

IAAC is Education, with the Master in Advanced Architecture, Advanced Interaction and the Master in City & Technology giving the next generation of architects and professionals the space to imagine, test and shape the future of cities, architecture and technology. This is possible through Open Thesis Fabrication, the implementation of Applied Research and allowing learning by doing, as well as through short programmes, implementing global agendas developed through local solutions, such as the Global Summer School.

IAAC is Fabrication, with the Fab Lab Barcelona, the most advanced digital production laboratory in Southern Europe, a laboratory where you can build almost everything, that recently hosted Fab10, the 10th annual worldwide Fab Lab conference.

IAAC is Research, with Valldaura Labs, a self-sufficient research centre located in the Collserola Metropolitan park, 20 minutes from the centre of Barcelona, where a series of laboratories are implemented for the production and testing of Energy, Food and Things.

And IAAC is also Barcelona, the European Capital for Innovation (2014), the city that aims to be a self-sufficient city, a Fab Lab city, a smarter city. Thanks to its innovative visions, IAAC is strategically aligned to the new urban policies of the city, developed in close collaboration and mutual inspiration between the two entities.

The Institute develops multidisciplinary programmes that explore international urban and territorial phenomena, with a special emphasis on the opportunities that arise from the emergent territories, and on the cultural, economic and social values that architecture can contribute to society today.

IAAC sets out to take R+D to architecture and urbanism and create multidisciplinary knowledge networks. To this end, the institute works in collaboration with several cities and regions, industrial groups, research centres, including the City Council of Barcelona, the Collserola Natural Park, the Massachusetts Institute of Technology (MIT), the Centre for Information Technology and Architecture (CITA), the Southern California Institute of Architecture (Sci-Arc), as well as diverse companies among which CISCO, Endesa, Kuka Robotics and many others. Together with these the Institute develops various research programmes bringing together experts in different disciplines such as architecture, engineering, biology, sociology, anthropology and other fields of investigation.

IAAC has made its name as a centre of international reference, welcoming students and investigators from over 60 different countries among which Australia, the USA, India, Brazil, Russia, Ethiopia, all European countries and many others.

MISSION
The Institute for Advanced Architecture of Catalonia (IAAC) is a vanguard academic and research centre whose mission is to promote scientific and technological innovation in the conception, design and construction of the human habitat, at all scales (from bits to geography), integrating technological, social and cultural innovations of our time and contributing to the consolidation of Barcelona as a global platform for the urban habitat.

To this extent IAAC works with a multidisciplinary approach, facing the challenges posed by our environment and shaping the future of cities, architecture and technology.

This is obtained through the focus on select criteria:
- Design for Self-sufficiency
- Application of ICT (Information and communication technologies) at all levels of daily life.
- Contribution to the distributed networks in the conception of the environment.
- Advanced digital and parametric design.
- Digital and Robotic Fabrication

VISION
IAAC encourages innovation and construction of the human habitat, offering a working environment in the following areas:
- Education through academic programmes for graduate students and international faculty and students, continuous education programmes in design, interaction, architecture, urbanism and landscape.
- Research by developing projects to expand the boundaries of architecture, in collaboration with experts from multiple disciplines.
- The development of innovation projects with companies and institutions that define role models, responding to global realities.
- The promotion of projects through publications, exhibitions and competitions developed physically and virtually.

For all this, IAAC works with local and global organisations participating in multidisciplinary knowledge networks. It promotes transformation from its humanistic ideology based on learning by doing.

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- Contribution

VALUES
COMPACT
An organisation that is flexible, agile, quick and able to anticipate new challenges of our time.

INDEPENDENT
Private foundation that collaborates with individuals, universities, companies and public organisations to innovate the human habitat and interaction.

GLOBAL
In thought and action, in the origin of human capital, learning from the diversity of the world, promoting the construction of local realities with very specific identity.

INFORMATIONAL
Recognition of digital systems as a technological base that transforms our world today, integration of technologies and processes associated in all areas of their action.

NATURAL
Promoting connected self-sufficiency, according to the rules of biological ecosystems, to help build a more ecological and social world.

HOLISTIC
Broad overview of the conception, design and construction of the human habitat, and this works at all scales, in interaction with multiple disciplines.

SOCIAL
Important social base, from interaction with individuals, companies and organisations that promote innovation in the construction of the human habitat, prioritising talent and avoiding social and economic stigmatism.

MODERNISM
7 works by Gaudi are UNESCO World Heritage sites.

IMAGE
Almost 2,500 film shoots took place in the city during 2015.

CULTURE
50 museums and exhibition centers, Palau de la Musica, Sonar, Primavera Sound etc. Barcelona is part of the Network of UNESCO Creative Cities as City of Literature since 2015.

SPORT
In addition to the pulling force of FC Barcelona, the city also hosts several international sporting events each year; these include the X Games, the World Swimming Championship etc.

PROFITABLE
Since 2000, Barcelona has been the top European city in terms of the quality of life of employees (Report by Cushman & Wakefield and Cinco Dias).

TOURISM
More than 15.5 million foreign tourists visited Barcelona in 2015.

AFFORDABLE
Barcelona is not among the world’s 50 most expensive cities (according to Mercer Human Resource Consulting).

MOBILE
The city will continue to host the Mobile World Congress (MWC) until 2018. Barcelona welcomes more than 70,000 visitors during this annual event.
- To underline and reinforce our position as a worldwide reference for education and research, as well as for self-sufficiency and digital fabrication, through the consolidation and expansion of research projects, as well as offering up to date and evolving academic programmes.

- To expand our collaborations with strategic public and private partnerships both nationally and internationally.

- To strengthen our consultancy role by creating specific alliances with industries that promote and support applied research.

- To actively pursue an agenda of activities related to green architecture, sustainability and renewable energies through the development of the Green Fab Lab, the Food Lab and the Energy Lab.

- To enhance our current work and profile as a specialised think tank for innovative strategies within the fields of urban planning and urban design with particular attention to the Smart Cities challenge.
The Institute for advanced architecture of Catalonia is located in the Poblenou neighbourhood of Barcelona, in the recently created district known as 22@, a focus for companies and institutions oriented toward the knowledge society. The neighbourhood is close to the historic centre, the seafront, the Plaça de les Glòries and the Sagrera APT station, making it the most dynamic enclave in the city.

IAAC is housed in an old factory building, with 2,000 m² of space for research, production and dissemination of architecture, so that the space itself is a declaration of principles, embodying an experimental and productive approach to architecture. The IAAC premises include the Fab Lab Barcelona, an architecture and design oriented fabrication laboratory which is part of the global network of Fab Labs set up by The Center for Bits and Atoms at MIT. The Green Fab Lab, hosted in IAAC’s forest campus in the Valldaura Labs, is also part of the same global network, a fabrication laboratory this time oriented towards self-sufficient and productive solutions.

Valldaura is IAAC’s second campus located in the Collserola Park, the natural centre of the metropolitan area of Barcelona. Valldaura campus is a large park and testing ground for innovation that features the latest technologies in the fields of energy, information and fabrication. The core of this innovative project developed by IAAC is a laboratory to implement investigation and set a new bench mark for self-sufficiency.

The Valldaura Self Sufficient Labs express a new concept for sustainability established by IAAC. Its aim is to create a sustainable, consciously designed ecology using both cutting edge technology and traditional craftsmanship.

Valldaura Self Sufficient Labs Centre is at the forefront of developing a new concept of habitability placing people as the centre of all actions.

Local self-sufficiency is promoted in the use of the environment, and the expansion of knowledge is promoted through the participation in global information networks to share and generate progress. The Valldaura Self Sufficient labs and its three Laboratories, Food Lab, Energy Lab and Green Fab Lab, allow to research the specificities of the production of key elements involved in self-sufficiency: food, energy and things, combining ancestral knowledge that connects us to nature with the latest advanced technology.
IAAC Educational Programmes give the next generation of architects the space to imagine, test and shape the future of cities, architecture and technology through applied research, learning by doing, and implementing global agendas developed through local solutions. IAAC is also part of the European consortium InnovaChain, a consortium of six renowned research institutions and 14 leading industry partners: an interdisciplinary network developing PhD research in innovative building design practice under the Horizon 2020 programme.

**MAA01 - 1 YEAR, 75 ECTS MASTER IN ADVANCED ARCHITECTURE**

The MAA01 - Master in Advanced Architecture Programme is oriented to graduates who wish to commit and develop their design research skills in the context of new forms of practice within architecture and urbanism, ranging from large scale environments to tectonic details and material properties. In order to allow the highest quality and applied research, the Masters in Advanced Architecture proposes a multidisciplinary approach, considering architecture as a transversal field for which it is imperative to integrate all research and applications with the knowledge of specialists form a diversity of fields of expertise.

The MAA01 emerges as an Innovative Structure focusing on five select Research Lines all led by Internationally renowned experts, and bringing together students and faculty from different disciplines and origins, towards the creation of a Networked Hub dedicated to Research and Innovation for the habitability of the 21st Century.

The programme is organised in four phases: three terms and the final project development phase.

**MAA02 - 2 YEARS, 130 ECTS MASTER IN ADVANCED ARCHITECTURE**

The MAA02 programme combines the first year Master (MAA01) with a second year of investigation towards the development of a thesis project. This programme allows senior students, already having developed the appropriate sensibility and tools from MAA01, to get further a personal investigation, around the themes of the advanced technology, architecture and urbanism. During this second year students are required to deal with a project counting on the possibility of developing it with international faculty and enterprises, highly specialized in different fields.

During the second year each student will propose and develop his/her Individual Thesis Project through an academic programme structured in:
- Individual Tutoring with internationally renowned experts that will support the student in the development and in the theoretical definition of the thesis project
- Seminars focused on the topics of Advanced Digital Tools, Research Methodology and 11 Fabrication.

The thesis, submitted in publication format, can be developed according to diverse research methodologies.

**MACT01 - 1 YEAR, 75 ECTS MASTER IN CITY & TECHNOLOGY**

The Institute for Advanced Architecture of Catalonia (IAAC) is launching an EU accredited Master programme in City & Technology (MaCT). In an effort of understanding the needs for the habitability of the 21st century cities and the significant role of technology for the formation of the new urban environments IAAC proposes a new Master programme oriented in training Change Makers that City Government Administrations, the Industry and Communities need in order to develop projects for the transformation of the cities. The Master programme represents an effort of facilitating the exchange of knowledge and the mutual learning of urban experiences among cities.

MaCT foresees new city economy and new city management models for the creation of a decentralized, productive and social city of the future.

**MACT02 - 2 YEAR, 130 ECTS MASTER IN CITY & TECHNOLOGY**

With the objective of furthering the research developed in the first year of the MaCT01 programme IAAC launches the MaCT02. Throughout the MaCT02 programme students will have the opportunity to work on an individual thesis focused on the development of a pilot project, allowing them to fully engage with both the theoretical and practical aspects of the project. The students will also follow associated seminars amplifying their knowledge of technologies associated to the urban context, allowing them to integrate these in the development of holistic projects, mixing technology with social, economic and environmental benefits.

The individual thesis, or pilot project, will allow the students to gain in depth knowledge on elaborating disruptive urban proposals that use technology to better citizens’ quality of life. Additionally, through the development of the individual thesis based on a real case study, students will have the opportunity to collaborate with industrial and governmental representatives, among the collaborative entities of the MaCT programme, giving students the necessary support and knowledge to develop solutions for the real world.

**MAEB - 12 MONTHS, 90 ECTS MASTER IN ADVANCED ECOLOGICAL BUILDINGS IMMERSIVE PROGRAMME**

Current discourses on sustainability and design do not yet adequately frame questions of energy and ecology. Whether you consider how building design overlooks landscape and urbanisation interdependencies, or incomplete understandings of the ecological processes that could otherwise better support building, urbanisation, and life today; or how the material choices in buildings are governed by stylistic abstract notions instead of something ecologically more powerful, the Master in Advanced Ecological Buildings aims for a more ambitious and comprehensive approach of energy and ecology for the built environment.

Following up the urban research carried out by IAAC in the last years in fields like Solar Housings, Eco neighbourhoods, Internet of Energy, Hydrogrid, Digital Fabrication, the immersive Master in Advanced Ecological Buildings (MAEB) aims at training professionals in design, prototyping, and fabrication of buildings as ecological and thermodynamic systems.

The immersive programme takes place in Valldaura Labs, IAAC’s campus located inside Collserola Natural Park in Barcelona.
The Master in Design for Emergent Futures (MDEF) is designed to provide the strategic vision and tools for designers, sociologists, economists, and computer scientists to become agents of change in multiple professional environments. This programme focuses in the design of interventions in the context of emerging futures scenarios in society and industry. Students will be encouraged to work at multiple scales (product, platforms, strategic planning and distribution strategy) in order to create prototypes to be tested in the real world. The theoretical and practical contents in this programme propose an exploratory journey aimed to comprehend and critique the role of disruptive technologies including digital fabrication, blockchain, synthetic biology, Artificial Intelligence, among others, in the transformation of the established order. The programme is recommended for designers, sociologists, computer scientists, economists, anthropologists, technology entrepreneurs and changemakers who are looking to develop an interdisciplinary career path to conceive and produce impactful ideas to transform the world. This Master has a high component of hands-on learning and project-based learning where students will be requested to turn big ideas into design strategies, prototypes and interventions to be tested in the real world, focused in Barcelona but connected globally with other cities.
FabLab Barcelona is one of the leading laboratories of the worldwide network of Fab Labs, a small scale production and innovation centre equipped with digital fabrication tools and technologies for the production of objects, prototypes and electronics. Fab Lab Barcelona is part of the Institute for Advanced Architecture of Catalonia, where it supports different educational and research programme related with the multiple scales of the human habitat. It is also the headquarters of the global coordination of the Fab Academy programme in collaboration with the Fab Foundation and the MIT’s Center for Bits and Atoms; the Fab Academy is a distributed platform of education and research in which each Fab Labs operates as a classroom and the planet as the campus of the largest University in construction in the world, where students learn about the principles, applications and implications of digital manufacturing technology.

The Fab Lab Barcelona has produced projects such as Hyperhabitat IAAC (official selection for the Venice Biennale XXI) or the Fab Lab House (Audience Award in the first Solar Decathlon Europe in Madrid). It is currently developing projects of different scales, from smart devices for data collection by individuals (Smart Citizen innovative project award in the Smart City Expo and World Congress in Barcelona), the development of the new generation of Fab Labs in the Green Fab Lab project, to the new production models for cities with the Fab City project being implemented in Barcelona in collaboration with the city council.

Fab Lab’s mission is to provide access to the tools, the knowledge and the financial means to educate, innovate and invent using technology and digital fabrication to allow anyone to make (almost) anything, and thereby creating opportunities to improve lives and livelihoods around the world. Community organisations, educational institutions and non-profit concerns are our primary beneficiaries.
As a part of the Fab City network, the Green Fab Lab works towards the creation of a self-sufficient habitat and research centre at Valldaura Self Sufficient Labs, one of IAAC’s campus locations. Located in the Collserola Natural Park, in the heart of the metropolitan area of Barcelona, it has laboratories for the production of energy, food and things, and develops projects and academic programmes in association with leading research centres around the world.

As part of IAAC’s commitment to promoting and advancing habitability in the world based on ecological principles and making the fullest use of all available technologies and resources, we have created a research centre focused on the idea of self-sufficiency, with a view to provide a worldwide point of reference. The Green Fab Lab offers an opportunity to learn directly from nature to bring that understanding to the regeneration of 21st century cities.

Bio Academy offers education on the implications and applications of synthetic biology. Students with no experience in any of the fields thereof are encouraged to first gather some experience in a DIY bio lab or via online courses, but there is no need for any official accreditation to sign up for the course.

How to grow almost anything (Bio Academy) is a Synthetic Biology Program directed by George Church, professor of Genetics at Harvard medical school. The HTGAA is a part of the growing Academy of (almost) Anything, or the academany.

Fab Academy is a distributed educational model providing a unique educational experience. It consists of a 6 month part-time student commitment, from January to June. The Fab Diploma is the result of the sum of Fab Academy Certificates. Progress towards the diploma is evaluated by a student’s acquired skills rather than time or credits.

The Fab Academy is a fast paced, hands-on learning experience where students plan and execute a new project each week. Each individual documents their progress for each project, resulting in a personal portfolio of technical accomplishments.

At the Fab Academy, you will learn how to envision, prototype and document your ideas through many hours of hands-on experience with digital fabrication tools. We take a variety of code formats and turn them into physical objects.

The Fab Kids, is a creative laboratory that favours the development of intelligence, creativity and imagination of children and youth. It is a place where thinking is encouraged and innovation occurs, a space where educational and recreational activities take place, focused on design and digital fabrication.

Fabricademy is a transdisciplinary course that focuses on the development of new technologies applied in the textile industry, in its broad range of applications, from the fashion industry and the upcoming wearable market. The two phase program will last 6 months, with approximately 3 months of seminars and learning modules and three months focusing on individual in-depth applied project research.

The methodology and network developed in Fab Academy platform has subsequently been used to add classes (collectively called Academany) that share the model of hands-on instruction to students in workgroups, with local mentors, linked by shared content and interactive lectures by global leaders.

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ELISAVA Barcelona School of Design and Engineering is the pioneer academy in this field in Spain, with more than half a century of experience. Founded in 1961, it promotes education, knowledge, research, development and innovation on design. Associated with the Universitat Pompeu Fabra (UPF), ELISAVA offers a Degree in Design, a Degree in Engineering in Industrial Design and a wide range of Master and Postgraduate programs in the areas of Space Design and Architecture; Graphic Design and Communication; Product Design; Design, Strategy and Management; and Interaction Design; to which must be added the MUDIC, first official Master in Design and Communication in Spain, and the innovative Master in Creative Process, to be taught from 2018. Through the relationship with businesses, institutions and society, ELISAVA trains its students to encompass professional challenges in an international context and it also delves into practical work and stimulates critical reflection among them, so they finish their studies with the ability to answer the needs of an evolving society. Inspiring, multidisciplinary, knowledge-generator and trendsetter, our centre trains professionals who will challenge the future.
As part of IAAC’s commitment towards the investigation of new and emerging areas of the Architectural discipline, pilot projects are launched on a yearly basis. These projects, such as the Fab Lab House (1), the Endesa Pavilion (2), Hyperhabitat (3) and Smart Citizen Kit (4), operate in the field between academia, architectural practice and information technologies, and are designed and fabricated by IAAC faculty, students and collaborative companies. These projects operate on several scales, from 1:1 architectural interventions to pocket sized microprocessors, all sharing a common vision of investigation towards a more sustainable and socially empowering design approach. All projects have been welcomed with considerable success, with various distinctions in events such as the Solar Decathlon and the Venice Biennale, as well as being published in several reviews and publications. In the development process of these pilot projects, IAAC collaborates with a network of partners from various disciplines, including leading universities and innovative companies.
EVENTS

The Pavilion of Innovation 2015 in Beyond Building Barcelona, curated by IAAC | Fab Lab Barcelona, presented new ideas and construction paradigms emerging from international excellence in research and pilot projects, forming the basis of future buildings and cities. Novel and reactive materials, advanced digital/robotic manufacturing techniques and responsive environments were the key topics presented, towards shaping the future of the building industry.

The twentieth edition of Barcelona Building Construmat, put a particular emphasis on innovation and new technologies. IAAC played a central role in the Future Arena of the fair, where the Institute could showcase its most recent research projects about additive and robotic manufacturing applied to the construction sector. On Site Robotics, the project born from the collaboration between IAAC and Tecnalia with the participation of Noumena, on-site construction of a 3D printed pavilion made with 100% natural materials, which has been completed in only four days.

This is an international event, focusing on the current state and future of Additive and Advanced Manufacturing.

The event, co-organised by IAAC Fab City Research Laboratory and Fira Barcelona, is a global hub bringing together all components of the Additive Manufacturing ecosystem to showcase the latest technologies and innovations.

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The Llum Bcn festival of lights takes place each year in February. For the 2015 edition, IAAC created an illuminated installation that combines art, tradition and technology. The concept of the installation follows a mixture of the elements of the tale of Santa Eulalia, in particular her tears, transforming these into conceptual rain. A rain of light, emanating from translucent vertical elements interacting with sounds and music.

La Llum Tafanera, The Curious Light, was an interactive kinetic light installation that wanted to make technology more friendly and closer to the public through the simulation of the personality of a star. IAAC once again had the honour of being invited to participate in the Llum BCN Urban Light Festival in Barcelona.

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Playball! is an interactive art light installation that engages a big number of users that play together to create a visual and aural experience. Playball uses light to create interactions between the viewer and installation, and between the viewers themselves.

Located in an enclosed patio in the Gothic quarter of Barcelona, the installation, an interactive audiovisual instrument, transforms the space through a musical performance based on citizen participation. The visitor enters the patio space and is invited to play with the strings of light, composing musical melodies based on the citizens’ real time interaction.

For the Llum Bcn 2014, in the courtyard of the Museu Frederic Marès in Barcelona, IAAC ‘plants’ DATA NET, a new artificial tree, forming an interactive mesh. The intensity of light of the installation changes, reacting to the location and the density of the visitors through a series of sensors that track peoples’ movement.
SPECIAL PROJECTS

RESEARCH 2014/2017

2017 - SUPERBARRIO // SUPERILLA

SuperBARRIO is a videogame that boosts participatory design processes. Developed as an open source video game for smartphone and tablets, it is a tool for architects and public entities to engage the citizens in the design of the public space, to educate to sustainability and inclusiveness, and to collect data about the citizens’ needs, desires and proposals. SuperBARRIO is a flexible tool that can be applied to different neighborhoods. Pilot projects have been developed for the Superilla Pilot Barcelona, and for the Gavaglio area in Genoa, Italy.

2016 - POBLEJOC // SUPERILLA

Poblejoc, an interactive installation conceived during the Active Public Space workshop, was designed as an Urban Game with the aim of activating public space. Poblejoc was created in the framework of the #Superilla (Super-block) workshop, a pilot test of the Superilla plan for Barcelona, that was developed in the Sants Martí district. The plan aims to close a part of the cities roads to traffic, allowing to use these new pedestrianised areas as public space.

2014 - LIBERTY

Designed and fabricated for the Re.Set festival, a circuit of ephemerous architecture in the streets of Barcelona, Liberty follows the concept of FREEDOM. Knowledge provides freedom and progress; and the power of freedom is expressed through reading. This installation consists of three different trees whose trunks and branches are made of steel, while the leaves are made of books, and the earth made of concrete. Liberty activates a new public space; a shady bench and a new interactive area in the city centre.
Castejón de Monegros has once again hosted the Nowhere Festival, the one-week festival promotes cultural and educational activities focused on the self-expression. The Nomad Folding Flax Pavilion, result of the lightweight Bio Composite seminar, was among the installations presented at the event, developed around the structural value of origami shapes.

The first pedestrian, 3D printed bridge in the world was inaugurated on December 14th in the urban park of Castilla-La Mancha in Alcobendas, Madrid. The Institute for Advanced Architecture of Catalonia (IAAC) was in charge of the architectural design of the bridge, which has a total length of 12 meters and a width of 1.75 meters and is printed in micro-reinforced concrete. The 3D printed bridge, which reflects the complexities of nature’s forms, was developed through parametric design, which allows optimising the distribution of materials to minimise the amount of waste by recycling the raw material during manufacture.

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The Institute for Advanced Architecture of Catalonia took part in the 15th Venice Biennale, titled "Reporting From the Front" and curated by Alejandro Aravena, with an interactive installation made in collaboration with the Indian architect Anupama Kundoo. Information Technology has opened up new ways of sharing knowledge, moving towards faster and more inexpensive ways, making knowledge more accessible, and making it easier to gather people around common topics of interest.

The exhibition Living in Future Cities is a product of work developed by the international architectural researchers of IAAC. The work examines issues of the near future and proposes a series of solutions in the era of experience, where technology can aid us to positively define the spaces and cities we live, grow and thrive in.

An exhibition that addresses the limits and potentials of generative drawing, emerging from data through mathematical and mechanical operations; raising questions on automation, reproducibility, and the role of the arbitrary or accidents as sources of creative experimentation. The research was developed in the framework of Machinic Protocols, a research line directed by Edouard Cabay, in IAAC’s Master in Advanced Architecture.

IAAC End of Year Exhibition Experience Future Cities, the public event which showcased the best projects of IAAC international researchers. The work displayed had been developed in Institute’s Master programmes. Given the multidisciplinary and multiscale nature of the Master’s methodology, the exhibition content ranged from experimentations on new materials to scale-up proposals for new cities, using a variety of materials and supports.

VENICE BIENNALE

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The Fab City Summit 2018 was an invitation to take part in the global shift towards a more sustainable and accessible future for cities and society. Participants to the summit were invited to experience and learn about how to grow the future of cities. The potential that collaboration and disruptive technologies have to create locally productive and globally connected cities was explored across greater Paris; a fertile territory with many initiatives around circular economy, co-living, urban food production and transformative policy.

The bi-annual summit gathers experts and communities interested in circular economy, urban planning, digital fabrication, new business models, civic engagement and sustainable design and production. Fab Lab Barcelona and IAAC were co-producers of the 2018 two week event at the Parc de la Villette and Hotel de Ville, specifically focused on curating the three-day speaker program which included speakers Saskia Sassen, Dave Hakkens and Mayor of Barcelona Ada Colau.
Maker Faire is a gathering of fascinating, curious people who enjoy learning and who love sharing what they make. From engineers, to artists, to scientists, to crafters, Maker Faire is a meeting place for these “makers” to show experiments, projects and innovations.

We call it the Greatest Show (& Tell) on Earth – a friendly showcase of invention, creativity, and resourcefulness. Glimpse the future and get inspired!

Maker Faire is a hands-on visual feast of invention and creativity and a celebration of technology, arts, craftsmanship, science, and the Do-It-Yourself (DIY) culture. It’s for innovative, creative people who like to tinker and love to create, and also for those curious minds who want to see what new and innovative things are just around the corner… and get hands-on!

Maker Faire Barcelona is not just another Maker Faire, or another event in the city, it is the celebration of a new vision for a productive city that a world capital in design, innovation, architecture, urbanism and creativity.

The fifth edition of Maker Faire Barcelona, was an event that aims to bring together Barcelona’s creative and innovation communities, and understand them as part of an ecosystem that holds the potential to transform how we will live, work and play in our cities, through the democratisation of technology.
Since the year 2000, the Master’s in Advanced Architecture runs an international lecture programme in which architects and experts from a variety of different disciplines present their work at IAAC. The lectures are open to the public, making it a high quality cultural activity open to the city of Barcelona.

2014/2018 LECTURERS

Massimiliano Fuksas
Bjarke Ingels
Elizabeth Diller
Bob Sheil
Laura Andreini
Li Xiangning
Izaskun Chinchilla
Oscar Tomico
Mitchell Joachim
Farshid Moussavi
Giovanna Carnevali
Rodolphe el-Khoury
Alberto Diaspro
Alfredo Brillembourg
Hubert Klumpner
Andrew Watts
Jose Luis de Vicente
Dave Pigram
Jelle Feringa
Aaron Betsky
Ali Basbous + Luis Fraguada
Kengo Kuma
Jan Knippers
Yael Reisner
Manuel Jimenez Garcia
Winy Maas
Benhaz Farahi
**Lecture Programme**

**LECTURE SERIES**

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**MAA 2014-15 LECTURE SERIES**

- Alfredo Brillembourg
- Rodolphe El-Khoury

**INSTITUTE FOR ADVANCED ARCHITECTURE OF CATALONIA**

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