



# Understanding what it means to design for emergent futures

Tomas Diez

Fab City Global Initiative  
Master in Design for Emergent Futures  
Fab Lab Barcelona at IAAC

tomas@fab.city

## Abstract

Few written reflective exercises about design in 2020 will not contain a reference to the current global pandemic we are witnessing in every single corner of the planet. A tiny virus is becoming one of the biggest challenges for humanity for the last 100 years, and while science is trying to control and defeat it, it keeps teaching us so many lessons in the form of paradoxes, contradictions, and evidence of the unessential layers of complexity we have been forced to get rid of, and we might not take back in any of the future "new normals". One of the main contradictions of our time is the fact that we need to operate in our current system in order to transform it. But our current systems operate under principles of occupation, control, and exploitation of lands and resources that once were in custody by others. The complete recognition of the underlying support values of our systems show us that we have been colonized, primarily by ourselves. We can recognize that we, as designers and consumers, are enablers of processes that go against our values and ethics, or projections about our own "self", and that convenience ends up being more powerful than those, due to the sense impossibility of choice. We were not aware of the abundance of choices until we are forced to remove some of them over imposed restrictions, like flying in airplanes, going to public events, or something as simple as eating in a restaurant. We always had the choice to stop flying, stop eating animal proteins, and buying on Amazon. We have just imposed ourselves as a global society to follow certain patterns of consumption, and by doing that we are imposing others to serve us. Every now and then we are forced to change these patterns, either by a global pandemic, or natural events. The collapse of the balance that keeps the temperature needed for life to exist on planet earth will trigger a series of catastrophic events for the environment, and the supply chains and logistics we are depending on. Our production and consumption models are not viable, and at the current speed of depletion of natural systems, we are removing choices from our everyday life, and removing

the diversity needed to keep those choices possible. In this paper, I want to escape the traditional approach to academic writing, as well as avoiding building new dogmas. Instead, I will share documented reflections about how our colonial past is where we root the current structure of relations between humans, and humans with the natural systems around them. I will also share experiences related to the work me and my team have developed in Barcelona and globally, in different projects and programs that have helped us to develop a Fab Lab that is not just about machines and technology, and programs that operate locally such as the Master's in Design for Emergent Futures, or globally such as the Fab Academy or Fab City. Finally, I want to share intuitions about the future of learning in the design field, and how making sense and making meaning need to be part of new learning spaces at all levels (personal, domestic, community, regional, planetary), in order to accelerate the transition towards ecological, diverse, and open futures.

## Introduction

The cultural conquest of the world led by the West for the last two centuries has gone hand in hand with technological development. It is not a coincidence that several technologies such as microwave ovens, handheld cameras, or the Internet itself, have primarily been developed with military funding behind them (Nowak 2011). Technology has been the definitive tool to colonize new lands and entire populations, access cheap raw materials, cheap labor, and cheap energy sources for transportation, as well as to the appropriation of intangible assets taken from communities around the planet. One of the most recent and influential colonizing processes that still dictates many of the principles of how we live, work, and play today, begins in the fifteenth century with the occupation ("discovery") of the West Indies (America) and accelerates significantly with the introduction of incentive mechanisms for its expansion thanks to an innovative approach to fund explorations in the search of unique species and treasures: shareholder structure. The United East India Company (Vereenigde Oostindische Compagnie; VOC) founded in the seventeenth century in the East Indies (Asia) gave birth to capitalism as we know it (Patel and Moore 2018). Such innovations in technology and economic structure, together with cultural dominance, have been the foundations of our current socio-economic systems. Without wanting to turn this essay into a critique of the West or to turn it into an anti-colonialist, anti-capitalist, or anti-imperialist rhetoric, it is impossible for me to understand the role of design in our current systems without referring to the historical processes that have shaped our culture.

The process of acceleration of modern Globalization happens thanks to the colonization process of the East and West Indies led by Europe. It increased the movement of material resources and people (colonizers, slaves) by maritime means on a planetary scale, thanks to advances in navigation and armament technologies. The trade of species, gold, new plants, among others, allowed the generation of capital and dividend distribution, controlled by the first transnational corporations and with the support of the Kingdoms (mainly European) in which religion and economy converged very well. The process of conquering the East and West Indies, supported by large slave industries in Africa, has been one of the darkest episodes in our recent history (Patel and Moore 2018). During the eighteenth and nineteenth centuries, the advent of the steam machine

led to the automation of production processes which put the continuity of artisanal production at risk, thanks to the economic efficiency generated by new manufacturing technologies, that make way for a new industrial revolution. It is economic logics, and not religious ones, that begin to mobilize the West in the consolidation of its sources of supply, as well as in the expansion of a cultural revolution in the occupied territories. Although the conquest of the new world was one of the largest economic operations that any corporation has ever made, its sustained exploitation to this day continues to provide incalculable benefits to a conglomerate of public and private interests.

The beginning of the twentieth century brought fundamental transformations, which can help us to understand how we live today. We saw the birth of wireless communications, oil as a source of energy and raw materials, automation as a production process, and many new forms of organizing our economy and society (Nowak 2011). Every moment of convergence in technology and socio-economic systemic change is built out of historical transformations that took place centuries ago. A cultural transformation in design and arts goes hand in hand with the disruption of modes of production and consumption, as well as with the emergence of new forms of communications. The role of the Bauhaus was fundamental to connect the industrial model of production that led to standardization, as well as with a cultural effect on what design's role is in society. The Bauhaus brought to the world incalculable benefits, but also extended the impact of the European conquer of the world for another century, perpetuating a colonial model that still influences design practice and education (Prado de O. Martins and Vieira de Oliveira 2016). From the second half of the twentieth century, we have seen how the digital revolutions in computing and communications have allowed us to become photographers, journalists, musicians, and participants in global conversations from our locality. These two digital revolutions have transformed the way we create, consume, trade, design and communicate. It goes beyond new tools and skills, the digitalization of society is increasing the pace in which change happens, making everything more liquid (Bauman 2005). It means that changes happen faster than they used to. Most recently, these are taking place in even shorter periods of time. Decades become years, years become months; change is happening rapidly, yet operates paradoxically inside the previous layers of transformations. While we are still adapting for the unpredictability of change, there are more revolutions coming, as well as more systemic crises.

The third digital revolution is in manufacturing, and it has been taking place during the last decades from the convergence of a series of events such as computer personalization, the birth of the Internet, advances in 3D printing, the growth of social networks, and the movement around open-source collaboration (Gershenfeld, Gershenfeld, and Cutcher-Gershenfeld 2017). The digital revolution in computing has been personal, with the development of the PC or the smartphone. The digital revolution in communications has been collective, but on a global scale, with the invention of the Internet and its mass adoption. The digital revolution in manufacturing is communal and operates in a territorial area such as neighborhoods in cities, or villages. New spaces for shared production such as Fab Labs and Makerspaces are inserted in the physical world offering access to infrastructure, but also to knowledge. However, the most important thing about these "third spaces" is that they provide the possibility of experiencing in the first person the power of making, they incentivize peer-to-peer learning, and have the potential to enable the improvement of the quality of life of communities with the development of interventions in the real world (Diez 2012). Although Fab Labs are laboratories, their logic does not

follow the same fundamentals of the collective image that we have of a place where people in white coats work with very complex tools to solve problems even more difficult to understand. It is a task for the Fab Labs and its associated community to understand that the challenges they face are not technological, but socio-cultural and ecological. Since the convergence of the steam engine, electricity and new global material ecologies based on extraction of colonized resources, cultural production has been standardized by the following industrial development during the last two hundred and fifty years, but it is not a definitive or irreversible process. During the pandemic, we have seen how fragile the supply chains are to events that have a global scale, and the dependence on external factors that put the health and well-being of local communities at risk. We have also seen the power of skilled people with access to rapid prototyping technologies to respond to necessities that emerge in the case of an emergency such as the spread of COVID-19, and potentially the disruption of the climate (Distributed Design 2020). Increasing the capacity and infrastructure to respond to any disruptive event is a basic need at the local level, without losing the connection with the global knowledge network that we have built in the last three decades it could become a key strategy to equip society for liquid and turbulent times, while recalibrating our relationship with the ecosystems which we depend upon, as well as overcome the need to compete in a race without any purpose beyond the growth of GDP.

## **The Opportunity of Convergence**

We are in a new period of convergence, thanks to the technological advances, and the sum of crisis (Fry 2018). New forms of synthetic intelligence, new material science and connected systems are opening up endless opportunities to re-calibrate the negative effects of the human-centered activities on planet Earth. Some of these emergent technologies – 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 is 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. We must be aware that the promise of these new technologies could lead us to repeat these extractivist and colonialist logics just as it has already happened with digital platforms such as Facebook, or Google, which operate as gigantic mines to extract personal data, and commercialize with them merchandise for product positioning through personalized marketing strategies. These are weapons to manipulate and have influence in the decision making of uninformed people, concluding in political and social devastating effects. This logic, translated to fabrication and the industry, have led to the occupation and standardization of ancestral production processes that not only contain the technique, but also the cultural, ecological and social relations around them, at the same time that could end up in a definitive global monopoly by the paradoxically named Amazon company around new automatized fabrication models, material development, and extended intelligence capabilities to improve design, decision making, and develop new knowledge to sustain human life in cities, its bioregions, and the planet in general. What is at risk is a new occupation by profit-driven companies of this opportunity that the actual convergence is generating, and the devastating effects

it could have for the future of diversity, opportunity, collaboration, and evolution of humanity in harmony with the natural systems that sustain the balance of life.

The relationship between cultural production and digital technology cannot be the same as those that have dominated in recent centuries, which have been modernizing and perpetuating colonialism (Prado de O. Martins and Vieira de Oliveira 2016). Digital technologies are fluid, almost liquid, and can operate within non-hierarchical models, and through distributed networks. Yet, they still depend on large-scale physical infrastructures such as underground cables for the internet, data processing centers, or antennas for our wireless connections, which are managed in a centralized way. Information and data flow through these infrastructures have become knowledge that could be accessible at a personal level almost ubiquitously but can also be facilitated at the community level in shared spaces such as innovation hubs, Fab Labs, or Makerspaces, as mentioned before. The role of these spaces is key to integrate the immense power of digital tools into a territorial and social dimension, and this is where Fab Labs and Makerspaces can support the development of sustainable communities at the hyper-local level, nurturing diversity and local wisdom, while being globally connected to a planetary brain. But technology is not enough.

## **From Fab Labs to Fab Cities**

Fab Labs started (almost) accidentally as an outreach program at MIT's Centre for Bits and Atoms in 2002, Fab Labs have since become an emergent network of digital fabrication laboratories around the world. First established in the South End Community Center in Boston as a collaboration between the National Science Foundation and MIT's Center for Bits and Atoms, there are close to two thousand, five hundred Fab Labs worldwide, from Bolivia to Ethiopia, to Amsterdam or Sydney. Using digital fabrication as the main focus, Fab Labs promote the idea of distributed design (Armstrong and Diez 2019) and manufacturing. Under the notion of distributed design, digital information containing dimensions, material configurations and instructions of products, tools, and other objects, can be accessible globally using the internet infrastructure. These files can be downloaded locally, be adapted to local contexts, and then manufactured using CNC machines, laser cutters, 3D printers and other simple tools available locally. Under this model, Fab Labs provide access to the knowledge on how to design and make almost anything, as well as prototyping capabilities, as well as hubs or connectors to local manufacturers at larger scale or specialized in specific knowledge and techniques. The Fab Lab network has demonstrated that it is possible to design anywhere and make anywhere too. This network has been growing exponentially during the last ten years, doubling every 24 months, similar to the rate established in the Moore's Law for microprocessors speed and cost (Gershenfeld, Gershenfeld, and Cutcher-Gershenfeld 2017). Fab Labs have the potential to impact profoundly how we live, work and play. However, they need better governance, validation and value exchange tools to incentivize the impact within the network and mature their growth, while increasing the connection and contextualization with the places where they are located in cities and rural areas.

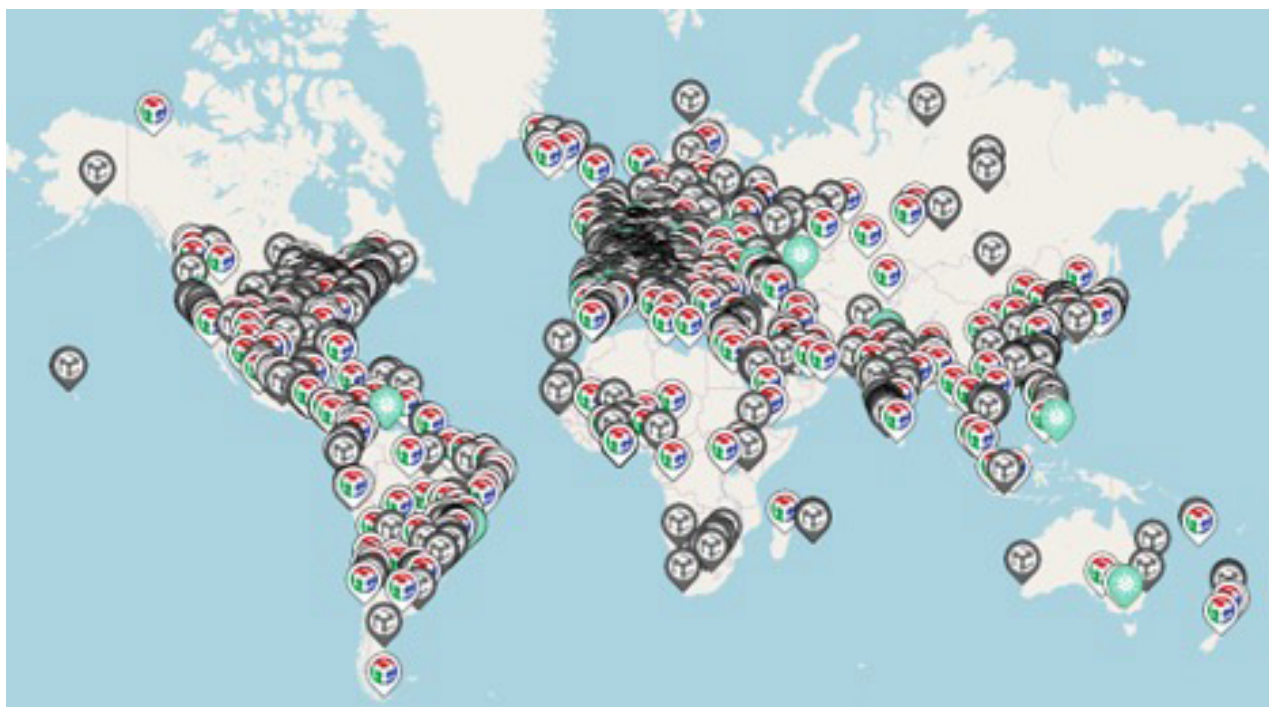


Image: Fab lab locations in 2020 (© data: Fablabs.io, map: GoogleMaps)

Fab Labs are not only technology and machines, they serve as a platform for the development of projects such as Fab City, but also for programs like the Fab Academy, which increases the potential for these spaces to influence and transform individuals, but also communities and territories through expanded collaboration with other networks. A fundamental step for any community to increase its impact is to develop new forms of learning and transfer knowledge. The Fab Academy has this role in the Fab Lab Network, by making accessible world class education in digital fabrication, blending online and offline education, and fostering hands-on and collaborative learning. Based on the famous course How to Make (Almost) Anything at MIT, since 2009 the Fab Academy has made available for students to attend the same course and structure as a MIT student from their local labs, without having to take an airplane or leave their context. For six months the course covers in weekly cycles the theoretical and practical knowledge to make anything using digital fabrication technologies (3d design and printing, CNC machining and cutting, electronics production and program, materials and composites, etc), giving the capacity to innovate and create products, technologies, and solutions that do not yet exist. There are a wide range of innovations coming out of Fab Academy, such as aquaponic systems, low-cost sensor devices to measure pollution, open source drones and autonomous vehicles, open source digital fabrication machines, low cost prosthetics, to name a few. These have the potential to be complemented with other learning courses that can offer the opportunity for students to learn in their own context, understand it, and impact on it. We are aiming to evolve "learning by doing" by adding "learning while impacting", given the context in which these labs operate, and the opportunities to work with problems that go beyond a technical challenge, but engages with the real world around them. However, this is still a target, and we have seen that these projects are not impactful enough to produce a wider impact beyond individuals or a very niche community of practice. They have a technical component developed at

a prototype stage in most of the cases, but they lack usability, sustainability principles, aesthetics, implementation strategy, and contextualization in a given location or community. In general, Fab Academy projects lack design, and not design as aesthetics, form or function, but design as the exercise to understand the systems that support an intervention and articulate the needed connecting elements between them in order to achieve a given purpose. The potential of Fab Academy is unquestionable but needs to be complemented with an approach to design education that can enable a "learning by impacting" approach to achieve the vision of Fab City. It is in this space where we place new programs that could be at a master level, but also includes vocational and executive training as part of a distributed learning platform for the Fab Lab and the Fab City Networks (Diez 2019).

While Fab Labs have been democratizing the access to technology, and knowledge about digital fabrication and building a global network, they still have the challenge to create impact beyond individual realization and learning. Fab City complements Fab Labs in this respect, and expands its purpose to transform communities, societies, and ecosystems; it aims to support the development of new approaches to innovation, learning and impact at the local level, while articulating global efforts (Diez 2018). Fab City brings the impact of digital technology available in Fab Labs to cities and rural areas, it connects distributed networks of hyper-local and productive ecosystems, which enable the mass distribution of goods and resources globally. By adopting the Fab City challenge, cities, towns, and regions, can radically transform the way production and consumption happens within their bioregions, by replacing standardization with smart customization, focusing on interconnected processes instead of isolated products, and more importantly: empowering individuals and communities while reducing the environmental impact of industrialization. The Fab City Global Initiative is an action plan for cities and their bioregions to make this shift possible and become more resilient through the re-localization of the production of energy, food and products, the reconfiguration of material flows, and the development of infrastructure to keep atoms moving at the local level, and bits traveling globally. It enables a global community of designers, makers and thinkers that amplify and multiply the impact of the revolution in digital fabrication and scale this important transformation together with government and industry.

Fab City is not just a concept, it is based on the fact that it is possible to reduce the movement of atoms that travel throughout the world, instead, bits of information allow the exchange of designs, while these are turned into things with local materials and manufacturing infrastructure. Since a fab lab is a place where you can make (almost) anything, in which there are machines that allow people to turn ideas into reality, and learn not only to be users of technology, but also to learn how to create it. If we can create technology then we can rethink how our mobility systems work, or how we filter water, create energy, produce and distribute medical devices, or how we produce food in urban areas, and how to use the organic waste from that food to be turned into biodegradable products, to name a few examples. These new approaches to production allow us to think that fundamental changes in our support systems can be enabled from the invention and experimentation at local level and sharing open-source knowledge on a global scale.

Similarly, computers connected to the internet are able to share information around the world from wherever you are, we imagine that cities and their bioregions are able to produce locally, using local materials where they need, using designs that

travel globally. This means thinking about design in a circular or a spiral way, it means transforming design from operating in silos or responding to established markets and vanished necessities, sustained by a non-viable material ecology around it. It means that humans can be more than consumers and numbers in followers or votes.

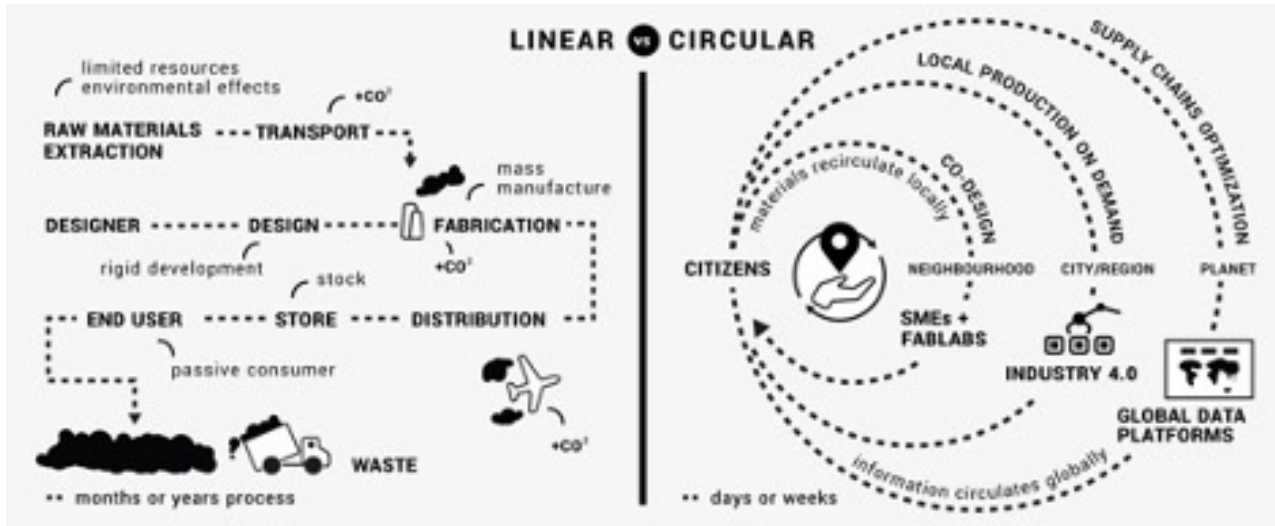


Image: Linear vs Circular Design. Tomas Diez and Mariana Quintero. Fab City Global Initiative, 2018

Changing the production model requires understanding that a transition to a regenerative, equitable, and universal socio-economic model is necessary, which allows incorporating cultural diversity, world views, ancestral knowledge, and an economy of care between people, and with living systems that make life possible. Design can enable this process through the creation of new learning spaces between culture, technology, nature, people, time, and purpose. These learning spaces need to incorporate knowledge, but keep dogmas away, as well as patterns of behavior or practice that contribute to the systemic problems embedded in the way we relate to resources and people, as well as how we consume and produce today. Such learning spaces through design, can help us to understand how cities and their bioregions can develop ecosystems for local production in the form of new relations and infrastructure to support them, and to enable local material flows which can be reinserted into the manufacturing capacity of the city (Thackara 2019) (Diez 2012). It is needed to create new spaces to nurture learning processes in the real world, in which designers teach, learn, practice, research, and transform any given realities, with access to tools for understanding the complexity in which the new design “practice” is already operating (Fry 2019).

## Design for Emergent Futures and Distributed Learning

The spaces in which design is learned in practice and theory need to be in close alignment with the social and ecological challenges of our time, and to relate to a new paradigm of global production such as the one proposed by Fab City, as one example of many like Kate Raworth’s Doughnut Economics, or P2P Lab’s Cosmo localism. Under this global infrastructure for digital fabrication represented by Fab Labs and Makerspaces, contextualized and connected learning becomes a key instrument to expand the

potential that these situated spaces have, and offers a platform for the development of new skills and capabilities to respond to a constant changing reality, incorporating new tools and technologies in the design and innovation practice, and connecting with real world problems. The current global pandemic has accelerated the transition to remote learning, by turning domestic spaces into classrooms, which can lead to isolation and the trauma of just being in front of a computer screen, and not considering the practical and experience power of learning. What we have been building since 2009 in the Fab Academy is distributed learning, which involves learning in front of the screen from tutors and peers around the world, but with hands-on learning experience in Fab Labs, where practical knowledge is incorporated through embodiment. We understand that it is important to add to the technical knowledge an expanded learning experience with purpose, which involves the context in which students operate, where they are agents of transformation, and experimentation with technology and communities. This contextualization is given already by Fab Labs, Makerspaces and innovation hubs, as spaces for learning acting like expansion of the classroom to a laboratory for acquiring new skills and prototyping, but also need incorporating the streets, communities, natural systems, and other elements of the real world as part of an that same classroom for impact creation in the real world, and the impulse of a new production paradigm based on regenerative principles, nurturing resilience, and supporting the development of an economy and society of care.

Under a new global production paradigm based on the distributive principles of the digital age, design is required to adopt a new role in a planetary constellation of crisis caused by the same productive model that took design to be a respected and admired discipline, especially during the last century. We need to reframe the design education that is based on colonial foundations and shift to how we learn to/from/with design, and imagine new processes, methodologies, and approaches to learn and understand how to design (Fry 2019). We have experimented with such novel approaches to design both in London and in Barcelona before. In Barcelona, we have been developing a program that is rooted in the principles of distributed design and manufacturing, open design, and critical and speculative design. At the Royal College of Arts and Society, James Tooze and I created and run the Exploring Emergent Futures (EEF) platform inside the Design Products MA program in London. For multiple reasons, EEF stopped being part of the new strategy in the DP program at RCA, and it evolved to become the master's in design for Emergent Futures in Barcelona, organized by Fab Lab Barcelona (IAAC) and Elisava School of Design and Engineering, led by myself and Oscar Tomico.

By Designing for Emergent Futures, we propose an approach to design that embraces radical experimentation through the combination of a series of methodologies and tools that support the development of skills such as the capacity to navigate uncertainty, incorporate complex technologies into design interventions, experiment and test in the real world, and the creation of narratives about possible futures which the student wants to engage with, and will dedicate time and effort to make happen. The emergent futures approach aims to evolve the role of speculative design as a practice to expand narratives about possible futures and inspire or becoming a tarot to anticipate what is about to come (Tonkinwise 2014). Instead, Design for Emergent Futures engages the designer in a process in which one needs to understand an ever changing and complex context and position its practice in alignment with the global challenges of our time and its personal purpose. While doing this, the designer that aims to discover emergent futures, is also

the creator of them, which puts it in the position of becoming part of the system that enables the futures that it is committed to make happen in the short, mid, and long term.

In order to learn how to Design for Emergent Futures, we have created a learning space for faculty and students in the form of a master's program, the Master in Design for Emergent Futures (MDEF). MDEF is a theoretical and practical program that evolves the practice of design beyond objects, aesthetics, form-finding and pure speculation through a unique hands-on learning approach. Our method uses design processes to investigate complex systemic problems and proposes design interventions at the small scale, to approach planetary challenges through the reconfiguration of relationships in our built world (Tonkinwise 2013). The program is organized in thematic tracks, as well as a temporary framework for delivering a project in the form of intervention in three terms. The students become part of an experimental program that starts to redefine what it means to operate in uncertain times as designers, incorporate new skills and disruptive technologies in the designer's practice, and understand the networked complexity of relations in the form of collaboration and interdependence.

The four thematic tracks of the program are: Exploration, Instrumentation, Reflection and Application.

- Exploration: We expose the students to a set of technologies that have the capacity to disrupt our present understanding of society, industry, and the economy.
- Reflection: We will support the students to develop their identity and a set of skills, knowledge, and attitude as designers of possible futures.
- Instrumentation: We will provide a set of skills and tools that will help to translate ideas into prototypes, and prototypes into products that are part of interventions, which can be tested and iterated throughout the design process.
- 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 the futures that they are willing to make happen.

The program organizes these different tracks during three terms, which have complementary objectives related to our approach to design for emergent futures.

Understanding and contextualizing interventions in times of uncertainty. One of the key elements of our program is for students to define and refine their purpose through amplifying the context in which they operate as designers. The systemic crisis, and the excessive amount of information around them have the potential to disenfranchise designers to act as change makers. Through the Atlas of the Weak Signals and a packed term with explorations in technologies, and alternative design approaches by exploring hybrid profiles of current practitioners, or learn how to design from first, second and third person perspectives (Tomico, Winthagen, and van Heist 2012), we aim for our students to first amplify and then refine their knowledge in the role of technology, design, and philosophy to dissolve the wicked problems of our time, and not solve them at once.

Designing interventions in the real world through iterative processes. Once students configure their design space with the combination of different crises, and by incorporating

new skills and perspectives to design, they are encouraged to reach out to other communities of practice that operate in the real world. In this way, the design studio is not only limited to the “classroom” or “the lab”, but expands to their homes and domestic spaces, as well as the streets, communities, companies, and organizations working in the fields in which they are interested to intervene. This process serves as an opportunity to find interventions in the real world and develops a way to learn how to design for emergent futures, while directly impacting current practices that are taking place. With this approach, we aim for interventions to become learning spaces for students to experiment with a new role as designers, becoming articulators of actors, technologies, methods, media, or skill sets, in a constant and iterative process to make sense of what is happening in the present, and how it can trigger emergent futures to dissolve wicked problems identified as weak signals.

Speculating, and enabling possible futures to be committed with. Such speculations are not related to provocative or inspiring artifacts brought to the present from the future (Raby and Dunne 2013), instead, we aim to work with narratives that incorporate diverse futures beyond objects and signify a commitment between the designer and the process of making those specific futures happen or provoke them. Speculative narratives in this case are not made by students for an audience, but for themselves as triggers to intervene in the present, in order to enable the possible futures they are committed to.

#### MULTISCALAR DESIGN STRATEGY

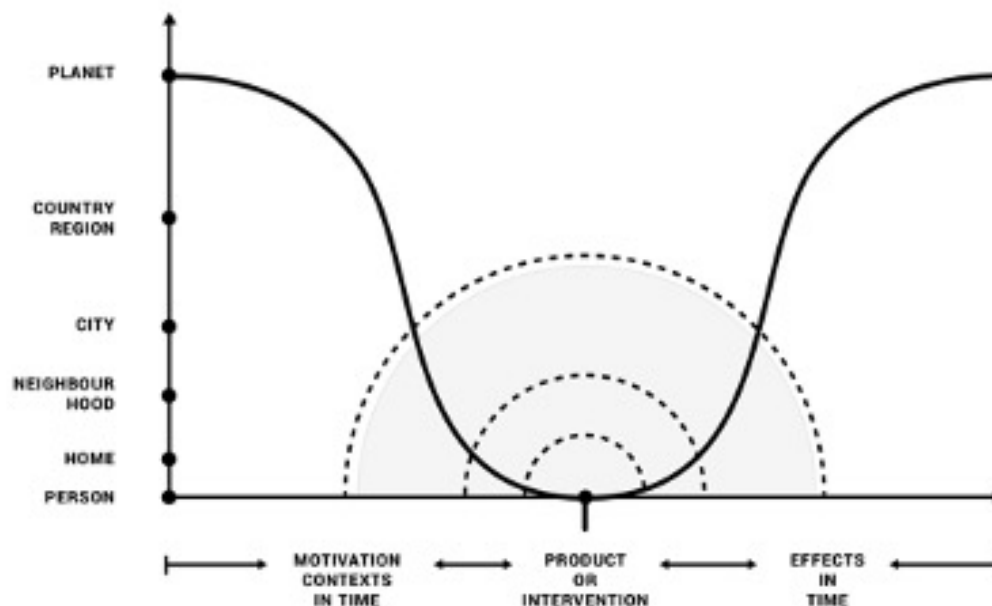


Image: Multiscalar Design Strategies. Tomas Diez and Mariana Quintero. Fab City Global Initiative, 2017

Design interventions become an opportunity to iterate and test in the real-world different approaches and test the skills learned through the program. It enables a virtuous cycle of learning between the student and any given context in which there is a desired impact in the form of agreement between stakeholders, with multiple approaches given the diverse nature of the program. Students come from different backgrounds such as product design, architecture, economy, engineering, or arts, as well as different previous working experience or academic degrees. We outlined a program that aims for the student to be exposed to new tools in form of emergent technologies, tests novel approaches to design that challenge the traditional relationship between design and objects or artifacts, create speculative narratives about possible futures enabled today, and incorporate a personal journey documented in their personal digital space.

The combination of the different tracks in the program, and the approach of each one of the terms, provides a structure for personal and professional exploration and builds the strategic vision and flexible skillset to design in uncertain times. At the same time, our program asks students to critically engage with the fields of speculation and foresight studies; they assess the role of disruptive technologies such as digital fabrication, blockchain, synthetic biology and Artificial Intelligence in the current transformation of society. Critically analyzing our today helps students design for the futures that are emerging from weak signals. We have incorporated the Fab Academy as a backbone of the program, to provide the digital fabrication and computer science literacy we believe should be required of any design student and researcher today, and to connect with a networked environment of learning that operates at a global scale. The master project is the main structural element of the program, and instead of designing products, devices or objects, we aim to design interventions in the real world, as an extension of the classroom, but also as a method to engage students with a specific context, space and time (Diez and Tomico 2020).

In order to facilitate the refinement of a student's purpose and align it with opportunities of intervention for their design project, we use the methodologies for personal reflection, and tools such as the Atlas of the Weak Signals (De Vicente, Pena, and Quintero 2019), or First Person Perspective (Tomico, Winthagen, and van Heist 2012). The atlas is an instrument for students to identify their field of action as designers, to pick their fights and major crises in which they want to become an agent of transformation. The atlas is aimed to be an ever-evolving tool that initially included 25 major topics, but that is constantly evolving in the concepts, terminology, and size of systemic crisis in which our program is focused to intervene. Collecting and organizing a representative group of weak signals that can describe possible vectors, discontinuities, and emerging casualties can serve as a new keyword taxonomy that offer a starting ground from where to analyze current systems and build possible scenarios (Diez, Tomico, and Quintero 2020). The initial identification of student's purpose through the guiding methodology of the Atlas lead to identify opportunities for designing interventions in current emerging contexts. These design interventions allow students to develop a learning process that is iterative, operates outside the lab or studio, and provides the space in which skills, artifacts, partnerships, concepts, and theories, are tested and studied, not only following the scientific method, but through critical reflection, as well as becoming part of the systems in which the student aims to intervene.

Some of the projects that have emerged from the program in the last two years are:



Image: First mycoremediation process, making an oyster mycelium digest a street cigarette butt. Nicolas Viollier, Master in Design for Emergent Futures 2018-2019



Image: GardenFit Project. Gardening is Exercise: Imagine our cities if we put the same amount of work, resources, time, infrastructure and money into gardening as we put into fitness. Magda Mojsiejuk, Master in Design for Emergent Futures 2019-2020

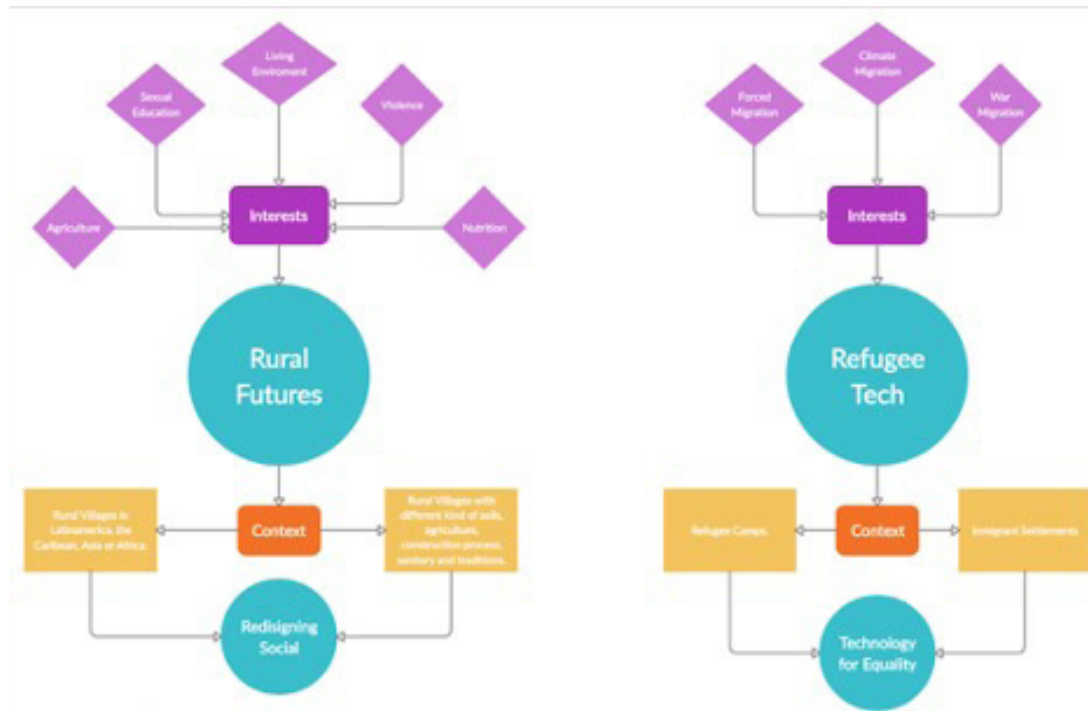


Image: Turning weak signals into opportunities of intervention. Pablo Zuloaga, Master in Design for Emergent Futures 2019-2020.

## A call for Distributed and Meaningful Design

One of the challenges for designers is how to embrace non-linear strategies in a world of complexity and chaos and embrace long-termism instead of instant gratification. Technology and design have progressed greatly, they have also produced imbalances that affect the way we live and work, and the use of the planet's resources to fill our homes with unnecessary devices and objects. Digital technologies have allowed access to information and knowledge as never before. Written language, the printing press, or the wireless communications have a similar effect in their moment of convergence with other technologies such as agriculture, fire, or new forms of energy such as steam or oil. The Internet is making it possible to learn ubiquitously, on demand, and through different media. Recently, the COVID-19 global pandemic has accelerated the transition to online learning environments, in the form of remote learning, a practice that has been adopted for years by MOOCs and other initiatives. With the example of a distributed learning program such as the Fab Academy, we can imagine that learning environments can happen globally, without the need to concentrate knowledge and talent within competitive environments. We can avoid perpetuating the system in which educated elites of candidates to become designers fly to the design cathedrals of the world to get "educated", as if they were barbarians, and need to get their dose of civilization from Europe and the west. This permanent colonization of design has been accentuated during the last fifty years. Design education is taking place without a context, as if it is a universal science that then could be applied elsewhere. Design studios from universities travel to third world countries to save them and place technologies and objects to make them look more like the colonizers that have set people's aspirations through cultural penetration led by markets. Design schools compete to become the

reference center of design education, by developing aggressive marketing strategies, trying to be located in the best ranking possible given by the enablers of colonizing principles, and put big names in their teaching faculty teams. But a different approach is possible with the notion of connected networks and distributed learning. We need to make a shift from educating barbarians in design school centers, to nurturing learning environments in which design is not a goal but the means to achieve the purpose to give back to communities and to living systems that have been penetrated and violated by colonialist and extractive principles for centuries. Given the recent call from the European Commission for a new European Bauhaus as "... is about bringing the European Green Deal closer to people's minds and homes. And making tangible the comfort and attractiveness of sustainable living." (European Commission 2020). A European Bauhaus based and operating in Europe does not make sense in the current interdependence of systems that operate at the global scale. Instead, we imagine a Distributed Bauhaus, global, which puts priority in places in which Europe took most lives and resources to expand its colonization process since the fifteenth century. This new Global Bauhaus can give us the opportunity to give a new meaning to design and evolve the values of the Bauhaus to adapt them to our times and our challenges. A Distributed Bauhaus based meaningful design, regeneration, and remediation. There is an opportunity to build a global learning platform using existing infrastructure and networks such as Fab Labs and many others, while remediating the impact of humans in natural ecosystems. I want to call this: Meaningful and Distributed Design.

Design is an act of making sense of the patterns of the world we understand, in order to influence them to create desirable futures, we give meaning to the world through design. The observer of those patterns in this case is not just part of the system, it is actually the system (Slavin 2016), so it cannot just wear a lab coat and pretend this is an experiment in which he is not interfering (Tomico, Winthagen, and van Heist 2012). Opposite to that, the observer is the designer, and the designer is also the victim of its own acts. The systems designers enable by the act of designing embed their understanding of these patterns. In order for meaningful design to happen, designers should cultivate their sense of purpose, and expand their views beyond the established forms of powers that aim to perpetuate themselves.

In this way, Meaningful and Distributed Design aims to engage this personal journey of self-discovery, with the act of making sense about the role of the designer in a wider context. It aims to also engage communities around digital and physical infrastructures to align their purpose in using technology and human knowledge to the recovering of autochthonous logics of the aboriginal and native cultures (Eglash 2016), and to be a channel to re-define our relationship with the resources we consume and the relationships of human beings that we have configured to organize them. The mission of promoting a new productive model is in the hands of a new generation empowered with technology and ancestral knowledge, which does not compromise the existence of life that makes possible the support and supply systems of our sources of energy and protection, nor perpetuates the construction of models of exploitation and enslavement between people or natural systems. Developing meaningful relationships between the ontological construct that operates locally and globally, is a foundational exercise that needs to move from the unconscious to the cultivated conscious mind. While this sounds like a philosophical exercise, it is exactly this hybridization of disciplines that design allows us to create.

Design can give us the power to intervene in contexts in which the smallest action can

have a great significance and meaning, as well as the potential to scale quickly thanks to the nature of digital technologies and how viralization can happen also with positive connotations. Design as a practice of making meaning of the everyday, and a way to embed ourselves in systems, requires the cultivation of one's wellbeing. The objectification present in design is rooted in the duality and separation between the person and its context, between mind and body, between thinking and being. We detach from others (people and systems), we create boundaries and develop layers that disconnect us from the web of life that makes it possible for humans to inhabit earth. A call for retrofuturism and the reinterpretation of the historical construct of the west. Without a hegemonic approach, the recognition of the past is something we should acknowledge in order to release ourselves from the heavy weight history has been trying to make us carry. When design is understood as a practice of liberation, we can also liberate ourselves from patterns that dictate how we relate with the resources around us, forms of life, as well with other human beings. We should think about designing as if we care.

## Bibliography

- Armstrong, Kate, and Tomas Diez, eds. 2019. *Distributed Design*. Barcelona: IAAC.
- Bauman, Zygmunt. 2005. *Liquid Life*. N.p.: Polity.
- De Vicente, Jose Luis, Lucas Pena, and Mariana Quintero. 2019. "Atlas of the Weak Signals." Fab Lab Barcelona Github Repository. <https://fablabbcn.github.io/The-Atlas-of-Weak-Signals/>.
- Diez, Tomas. 2012. "Personal Fabrication: Fab Labs as Platforms for Citizen-Based Innovation, from Microcontrollers to Cities." *Nexus Network Journal* 14:457-468. <https://link.springer.com/article/10.1007/s00004-012-0131-7>.
- Diez, Tomas, ed. 2018. *Fab City. The Mass Distribution of (Almost) Everything*. N.p.: IAAC.
- Diez, Tomas. 2019. *Outro: Designing Emergent Futures*. N.p.: IAAC.
- Diez, Tomas, and Oscar Tomico. 2020. "Master in Design for Emergent Futures." Fab Lab Barcelona Educational Programs. <https://fablabbcn.org/education/master/master-in-design-for-emergent-futures>.
- Diez, Tomas, Oscar Tomico, and Mariana Quintero. 2020. "Exploring Weak Signals to Design and Prototype for Emergent Futures." *Temes de Disseny* 36:70-89. <https://raco.cat/index.php/Temes/article/view/373819>.
- Distributed Design, ed. 2020. *Viral Design. The COVID-19 Crisis as a Global Test Bed for Distributed Design*. Barcelona: IAAC.
- Eglash, Ron. 2016. "An Introduction to Generative Justice." *Teknokultura*. [https://www.researchgate.net/publication/311811471\\_An\\_Introduction\\_to\\_Generative\\_Justice](https://www.researchgate.net/publication/311811471_An_Introduction_to_Generative_Justice).
- European Commission. 2020. "Press statement by President von der Leyen on the New European Bauhaus." European Commission Press Corner. [https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT\\_20\\_1902](https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_20_1902).

Fry, Tony. 2018. "Design, a Philosophy of Liberation and ten considerations." *Strategic Design Research Journal*, no. 11(2), 174-176. 10.4013/sdrj.2018.112.16.

Fry, Tony. 2019. "An Unfolding Political Agenda." In *Integrative Design: Essays and Projects*, 32-43. N.p.: Birkhauser Architecture.

Gershenfeld, Neil, Alan Gershenfeld, and Joel Cutcher-Gershenfeld. 2017. *Design Reality*. N.p.: Basic Books.

Nodder, Chris. 2013. *Evil by Design: Interaction Design to Lead Us into Temptation*. N.p.: Wiley.

Nowak, Peter. 2011. *Sex, Bombs, and Burgers: How War, Pornography, And Fast Food Have Shaped Modern Technology*. N.p.: Lyons Press.

Patel, Raj, and Jason W. Moore. 2018. *A History of the World in Seven Cheap Things: A Guide to Capitalism, Nature, and the Future of the Planet Kindle Edition*. N.p.: Black Inc.

Prado de O. Martins, Luiza, and Pedro J.S. Vieira de Oliveira. 2016. "Breaking the Cycle of Macondo: Design and decolonial futures." *XRDS: Crossroads, The ACM Magazine for Students* 22 (4): 28-32. 10.1145/2930880.

Raby, Fiona, and Anthony Dunne. 2013. *Speculative Everything*. N.p.: MIT Press.

Slavin, Kevin. 2016. "Design as Participation." *MIT JoDS*. <https://doi.org/10.21428/a39a747c>.

Stary, Christian. 2015. "Towards Digital Craftsmanship." *Int. Conference on Knowledge Management ICKM 2015*. [https://www.researchgate.net/publication/283724825\\_Towards\\_Digital\\_Craftsmanship](https://www.researchgate.net/publication/283724825_Towards_Digital_Craftsmanship).

Thackara, John. 2019. "Bioregioning: Pathways to Urban-Rural Reconnection." *She Ji: The Journal of Design, Economics, and Innovation* 5 (1): 15-28. <https://doi.org/10.1016/j.sheji.2019.01.002>.

Tomico, Oscar, VO Winthagen, and MMG van Heist. 2012. "Designing for, with or within: 1 st , 2 nd and 3 rd person points of view on designing for systems." *NordiCHI '12: Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design*. <https://dl.acm.org/doi/10.1145/2399016.2399045>.

Tonkinwise, Cameron. 2013. "Design Away: Unmaking Things." *Academia.EDU*. [https://www.academia.edu/3794815/Design\\_Away\\_Unmaking\\_Things](https://www.academia.edu/3794815/Design_Away_Unmaking_Things).

Tonkinwise, Cameron. 2014. "How We Intend to Future: Review of Anthony Dunne and Fiona Raby, *Speculative Everything: Design, Fiction, and Social Dreaming*." *Design Philosophy Papers* 12 (2): 169-187. 10.2752/144871314X14159818597676.