Driving Design

Collective approaches enriching design principles

Edited by Distributed Design Platform

The cover of the 2023 edition of Driving Design, was generated in collaboration with AI (Dreamlike.art) the prompt used is "Melted risograph, gradient waves, geometrical logic, simple pattern, printed grain, high quality detail, 3d plastic render, oscillate, mapping illustration" and the seed is 37756092

Introduction

Jessica Guy, Distributed Design Platform lead at Fab Lab Barcelona | IAAC

Driving Design is the fifth of seven publications from the Distributed Design Platform. Established in 2017 and co-funded by the European Union, the Distributed Design Platform brings together Fab Labs, Makerspaces, cultural organizations, universities, and design centers from around the globe. The community is growing in members, local and global collaborating organizations, and Creative Talents in Europe and beyond. Over the past four years, the platform designed and supported the development of local and global programming, strengthened a network of creatives and fostered opportunities to learn and exchange.

Each publication is an opportunity to explore the advances and challenges in the field of Distributed Design while also reflecting on the values of collaborative, openness, regenerative, and ecosystemic practices and how these contribute to the exchange of knowledge, skills, value, and power. In the last book, This is Distributed Design, we consolidated best practices and state of the art interventions in the emerging field of Distributed Design. In this year's edition, we highlight the motivations, opportunities, and challenges that drive the practitioners and the field of Distributed Design.

In increasingly challenging times - the climate emergency, divisive political situations, escalating conflicts, and systemic inequality - it is even more important to question why and how we intervene as creative practitioners. How can Distributed Design create more equitable presents and futures? What are the gaps and challenges to overcome? How can we foster reciprocal relationships between diverse communities and the environment? What new worlds are we going to explore when we investigate designing with extended and other intelligences? And with that, we ask who and what are the drivers of Distributed Design in 2023?

An open call was launched to explore possible answers. Designers, makers, craftspeople, and scholars have answered our call and shared their approaches and areas of exploration in a selection of emerging themes. Each of the five chapters build upon the other. First, we connect to the last article in the This is Distributed Design book from 2021 - The Bauhaus Society - to explore new areas of intervention for Distributed Design. Then we dive deeper into how we learn and unlearn the design practice in the first place. We highlight the importance of reconnecting to ancestral wisdom and the potential to share knowledge, skills, and power by connecting it with emerging technologies. Then we explore how we can create and reclaim agency through design practices. Finally, we reflect upon the evolution of the commons in the age of technology and how we can use collective responsibility to manage it.

Enjoy a glimpse into the field of the ever-evolving field of Distributed Design.

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How the future. New forms of learning and unlearning

The Bauhaus taught us to reflect on the design process and we can continue to push the boundaries as we unlearn, relearn and reimagine how we practise design. Learning by doing, designing with others, curiosity, project-based solutions in local contexts and life-centred approaches are helping us understand how to move beyond our current design paradigm and create inclusive, regenerative and meaningful interventions. This section questions and proposes new approaches to: how and what we learn; who learns and who we learn from; and why we learn what we do.

Chapter 02

Prototypes as learning tools for exploring biomaterials

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Prototyping as a design phase

Design as a discipline over time has increasingly drawn closer to other fields, fostering its contamination with other multidisciplinary and interdisciplinary knowledge and skills. This seeking of connections and contamination resulted in the construction of profiles such as designers skilled in conceptualizing, developing, and communicating responsive solutions to the principles of innovation, ethics, usability, etc. These skills are gained through experience and practice with multiple tools and techniques, among which the effectiveness of the creation of mock-ups and prototypes stands out.

The prototyping activity is an already recognized and well-established moment within the design process. No one can write without editing; in the same way, the design process stipulates that, after an initial phase of formal definition of the conceived concept, moments of verification are necessary. These verification moments can be effectively achieved through the creation of tangible artifacts, such as mock-ups and prototypes, terms often used interchangeably.

When we refer to a mock-up, we deal with an artifact made in the midst of the design phase, representing an active tool for verification and formal redefinition; what is relevant is not so much the aesthetic quality but the ability to be compliant and responsive to the design requirements (Polato, 1991). The prototype is an early or original form, a full-scale model of a structure or part of the equipment used in evaluating form, design, fit, and performance (Morris, 1992). We can assert that the term prototype could be considered ambiguous because it doesn't rely on how it is manifest; what defines a prototype is that it is used to explore or demonstrate some aspects of a future artifact (Coutts et al., 2019). To disambiguate any interpretations, we will refer to these as prototype artifacts (PrArts).

In the past, PrArts were made by hand from materials such as wood, clay, paper, and cardboard. Today they are increasingly produced through the use of digital fabrication machinery, such as CNC milling machines, laser cutting machines, and 3D printers. The places where it is possible to find an aggregation of all these easily accessible technologies and machinery are Fab Labs and makerspaces, within which PrArts are made in a remarkably fast and aesthetically pleasing manner. Places play an elective role in conducting this experimental and knowledge validation process, shared through innovative and integrated processes. However, this trend is causing a parallel phenomenon in which designers and makers lose sight of the intermediate steps that bring real value to the prototype phase, namely the moments of verification and understanding of shape, as well as the orderly creation of different functional alternatives to be tested and validated. Almost anything that is being formalized through 2D or 3D modeling software is readily producible and reproducible, so the wiping out of the time and effort of manual labor invested in the creation of the PrArt often makes it less meaningful.

In this way, the PrArt has been transformed into a prototype, regarded as an outcome instead of an element within a design process, due to the ease of producing a functional and usable product, with an aesthetic performance often no match for other industrial artifacts, made possible by digital fabrication technologies. From this comes the conclusion that increasingly the PrArt is being strongly influenced by the possibilities offered by the technologies available to the manufacturing space, as well as the designers' ability to know how to work with 3D modeling software and parametric and generative plug-ins. Actually, places - understood as containers of digital technologies - do not take on a particular value, which is instead attributable to the human capital and the communities and groups that populate them, whose know-how is transmitted and increased through mutual comparison, exchange, and collaboration.

During the creation of PrArts, it is appropriate for the designer to reorient his or her attention: to move away from the tendency to design for another technological intelligence - found in digital machinery - to reassume the cognitive act in which the available technologies and intelligence are considered as elements of a system of opportunities that enables the formalization of prototypes and products in line with the design stimuli and needs of users and communities. Therefore, the prototyping phase is a moment in the design process that requires an act of critical responsibility on the part of the designer.

Designers, historically, express an idea of the artifacts as prototypes (Giaccardi, 2019). Building prototypes is essential in the development of virtually and manufactured products, for example, to foster testing and proving of ideas (Chua et al., 2010; Ulrich & Eppinger, 2011). A prototype could be a sketch, a mock-up, or polished material outcome confronting the world of ideas and skills of the designer with the world out there before a final artifact exists (Bucheneau & Fulton Suri, 2000). So, the prototype is an artifact for sure, but not necessarily a product, and each prototyping effort requires a specific strategy to resolve a design problem or opportunity (Camburn et al., 2017). According to Giaccardi (2019), when talking about prototypes in the design field, the critical aspect concerns the purpose, and the possible scope could refer to one of the following categories:

1. prototypes for evaluating design outcomes
2. prototypes for empirically testing hypotheses
3. prototypes for supporting materials explorations
4. prototypes for exploring areas of concern
5. prototypes for provoking alternatives.

The first category refers to all those prototypical artifacts that arise and qualify as tools for reflecting (1) on the quality of the idea and the potential outcomes related to it. In this case, the evaluative capacity of a PrArt is what takes on value. In the second category, PrArts are intended to test hypotheses and ideas (2) in order to build a theory based on verified, tangible evidence. In this case, PrArts are nothing more than data collection tools during empirical evaluations of an experimental nature. When we talk about the third category, we refer to PrArts used as demonstrators of experimental research lines and directions (3). Here we frequently situate experiments on materials and strategies that can open the way to design directions not conceivable at first sight. Then there are PrArts in the fourth category, which are those tangible elements that can be used as something visible and bounded (4) without a purpose related to knowledge exploration or production. PrArts in this category can form a collection of artifacts that are relevant to both designers and users because they can immediately convey their main issues. Finally, there are PrArts that can be used as provocative tools and/or to stimulate alternative thinking outside a linear framework (5). The provocation generated can also take on the value of transgressing social and cultural norms to stimulate debate related to hypotheses for building an alternative future.

Alongside, after a consistent literature review, Camburn et al. (2017) identified a solid connection between the purpose, the reasons why a designer has to make a prototype, and the techniques that can be embraced to produce the final output. There can be two main strategies: iterative prototyping and parallel prototyping. Iterative prototyping works for sequential testing and related refinement of a PrArt, proving particularly useful when one must tackle results that are responsive to specific challenges (Moe et al., 2004). Conversely, parallel prototyping is a helpful strategy for exploration activities where there may be alternatives to evaluate, thus helping to gather critical and informed feedback (Christie et al., 2012).

But how do these typological categorizations and strategies for making PrArts find their place within open and distributed digital fabrication spaces? Here we are going to give a critical reading of what we are currently witnessing, also bringing the example of the experimentation conducted at Polifactory (Fab Lab and makerspace of Politecnico di Milano) within De_Forma, a project that aims to investigate the relationship between biobased materials and spaces and tools for digital fabrication.

Opportunity and limitation: the dichotomy of digital fabrication technologies in the design act

Over the last decade, the Fab Lab model has spread widely, often in connection with or within universities, especially those related to design disciplines. This phenomenon is closely interconnected and interdependent with the accessibility (in terms of use, affordability, geography, etc.) of technologies and tools for digital fabrication. At the same time, when speaking of the relationship with the university and within design schools, the enabling possibilities offered by digital fabrication technologies often contribute to distorting the prototype phase as an active part of the design process.

Indeed, in the case of schools of design, this trend is a reflection of a growing habit that leads students to consider PrArt as a result in itself and not as a tool to support the ideational phase of the design process. The exploratory and communicative moment of ideas through sketches and immediate drawings on paper is replaced by the use of three-dimensional modeling software, which is increasingly widespread, intuitive, and accessible. Thus, when the three-dimensional file replaces the sketch, the mock-up also undergoes a transformation in sense and identity, becoming the product of a 3D printer, also increasingly widespread, intuitive, and accessible (Riascos et al., 2015). This trend, which is constantly growing and very difficult to dispute, presents several critical issues for the development of design skills and practice on the part of the student.

Unfortunately, when 3D-printed artifacts take the place of the mock-up in the design phase, there are mainly negative effects. For example, students often self-limit themselves in devising formal and functional solutions that are not primarily aimed at meeting previously defined design requirements.

Thus, at this specific point in time, the democratization of 3D printing technology (Von Hippel, 2006) means that the proposed design solutions clash with the level of knowledge acquired by students in the use of 3D modeling software. Particularly in the first few years of the Bachelor's degree course, knowledge of 3D modeling, through which files for 3D printing can be generated, is limited and restricts the design process. Moreover, when 3D printers are used to give shape to an idea, they are rarely considered by students and young designers as a production technology but rather as a tool for the direct and rapid materialization of their concept.

In doing so, there is a lack of reflection, understanding, and awareness that objects designed for another production chain (from polymeric materials to other types of material) are not necessarily correct if they are made or materialized with 3D printers or in general through Fused Filament Fabrication/Fused Deposition Modeling (FFF/FDM).

In the dialogue and overlap between the activities of design universities - in the teaching and research dimension - and Fab Labs, we can observe the emergence and radicalization of this trend, in which design reflection through PrArt is lacking in favor of PrArt per se.

In this regard, we can see that there are mainly three types of interpretations of PrArt taking place:

- PrArt as the result of a linear and structured process in which the materials and digital technologies available in fab labs and makerspaces are used to shape an object and initiate a reflection limited to the object itself;
- PrArt as the result of a linear but unstructured process in which reflection on materials and possible production alternatives occurs superficially at the end of the design and development process. This type of approach is typical of students in their training, who superficially select the materials to be applied to the developed product, selecting in an uncritical and decontextualized manner the technologies of the production tools, especially with regard to digital fabrication;
- Artifacts that are the result of an iterative process in which it is not only the outcome - documented and replicable - and thus the product that assumes value, but the process by which the output was arrived at, which led to the construction of knowledge - personal and widespread - awareness of the product, materials, and possible production alternatives technologies.

'Design and related exploration are necessary and fundamental in increasing and amplifying the role and value of Fab Labs and the situated knowledge that characterizes these spaces.'

This latter interpretation is the most significant with respect to the university mission and that of the Fab Labs. In fact, in their shared vision, the third interpretation turns out to be more interesting because it concerns both the project understood as a didactic result and as an artifact in itself and the project understood as an exploration - on the project and its geometric, formal, material, use, accessibility, producibility, etc. components. Design and related exploration are necessary and fundamental in increasing and amplifying the role and value of Fab Labs and the situated knowledge that characterizes these spaces.

In this experimental dimension, in recent years, we have witnessed a growing interest on the part of universities, Fab Labs, and companies in the biofabrication and growth of bio-based materials. Biofabrication refers to the process of growth and production of materials (Chambers & Karana, 2017) and the subsequent possibility of realizing complex artifacts. The De_FORMA project fits into this scenario.

De_FORMA: when prototyping meets the world of bio-materials

De_FORMA is a project born in late 2020 in Politecnico di Milano - Department of Design, as a collaboration between a group of researchers and Ph.D. students. The project aims to explore the possible collaboration and contamination between the bio-fabrication of sustainable growing materials and Digital Fabrication processes. This design activity constitutes that reflective practice that allows us to figure out the possible futures for Design research and practice.

In a broader, contemporary scenario, research is pushing toward the exploration of innovative strategies to overcome production linearity in favor of circular and holistic practices (Moreno et al., 2016). Designers, autonomously and independently, are on the lookout for new materials and material properties (McQuaid et al., 2019, p. 106). From this perspective, research in design and through design may offer an interesting opportunity for bridging the world of practical experiments with that of design research. This entanglement of research domains is possible due to the holistic nature of design and the capacity of designers to guide and face complex problems with a flexible attitude (Dorst, 2016; Dorst, 2019).

Enabling by design, this synergy between exploration and practical grounding of research results allows reaching consistent research results, which for their practical nature, can easily set the ground for multidisciplinary activities and hands-on practices, also in the dimension of teaching and learning. Specifically, experimentation linked to exploring and understanding raw bio-materials offers a nourishing base ground to produce new knowledge in different domains, both theoretical and practical, to be used for research and didactics aims.

In fact, contamination between design and biology through bio-fabrication techniques (Fritz et al., 1994) is a promising and interesting research field. Bio-fabrication techniques deploy hybridization between designing and natural processes until we understand how to co-design with living beings to realize biomaterials and growing materials (Camere & Karana, 2017; Myers, 2012), contributing into the creation of an emergent research area, already populated by numerous studies (Myers, 2012; Stephanopoulos, 2022). In particular, the growing materials (GMs) are realized from living organisms such as fungi (Karanaet al., 2018), algae (Wijffels et al., 2013), and bacteria (Lee, 2011). These materials are characterized by: their assembly precision at the nanometric scale, the possibility of being influenced by the growing environment to embed different properties in themselves [18], the auto-assembly capability both at macro and micro scale (through hierarchical structures) (Lehn, 2002; Whitesides & Grzybowski, 2002), and by the programmability of their growing in non-standardized shapes to realize materials in a zero-waste perspective.

All the cited characteristics show how the growing of materials instead of extracting them is a practice that could efficiently embrace production logic that is sustainable, circular, and low impact. Notably, Bacterial Cellulose (BC) can find wide application in artifacts design and production; BC can derive, among others, from the fermentation of Kombucha tea supplemented with Symbiotic Colony of Bacteria and Yeast (SCOBY), and, due to its growing behavior, seems a sustainable alternative to traditional materials production lines.

De_FORMA aims to develop multidisciplinary knowledge on the themes of growing materials and digital fabrication, identifying and verifying potential applications in sectors such as consumer electronics, lighting, healthcare, and fashion-tech.
In De_FORMA, digital fabrication represents an enabler for the construction of ecosystems to cultivate growing materials. The project explores the possibility of building an experimental and flexible production system that allows the integration of formal choices, surface treatments, aesthetics, and additional integration a priori, with a zero-waste logic toward environmental sustainability.

IMAGE 1. Some of the bacterial cellulose PrArt obtained over the duration of the De_FORMA trial

In De_FORMA, the main object of observation and study is a particular type of bacterial cellulose, a biological product derived from Kombucha fermented tea and commonly known as SCOBY. The innovative element of the project lies in the idea of being able to conceive, produce and develop new growth chambers for the SCOBY according to the specific scope of application and hybridizing it with other materials or technological elements. This change of approach has the advantage of realizing a bacterial skin with the preset shape, color, and thickness of the final semi-finished product, avoiding post-production processes. The first result is the construction of new scientific knowledge based on practical and replicable evidence. The empirical results could be scaled to improve the lifestyle of users, with particular attention to the construction of a sustainable supply chain, using design as a holistic discipline. To date, the project has achieved the ideal growth parameters of the SCOBY. The programming of the cultivation of growing materials into specific shapes and with textures aiming at the aesthetic characterization and the integration of sensors and actuators on its surface is still evolving.

According to Giaccardi (2019), our prototypes aim to explore the characteristics (e.g., physical, mechanical, aesthetical, etc.) of the material at different stages of its development and implementation. In addition, we use the material to gather insights to identify the proper process to better its cultivation (prototypes for empirically testing hypotheses) according to the future field of application and usage (prototypes for provoking alternatives).

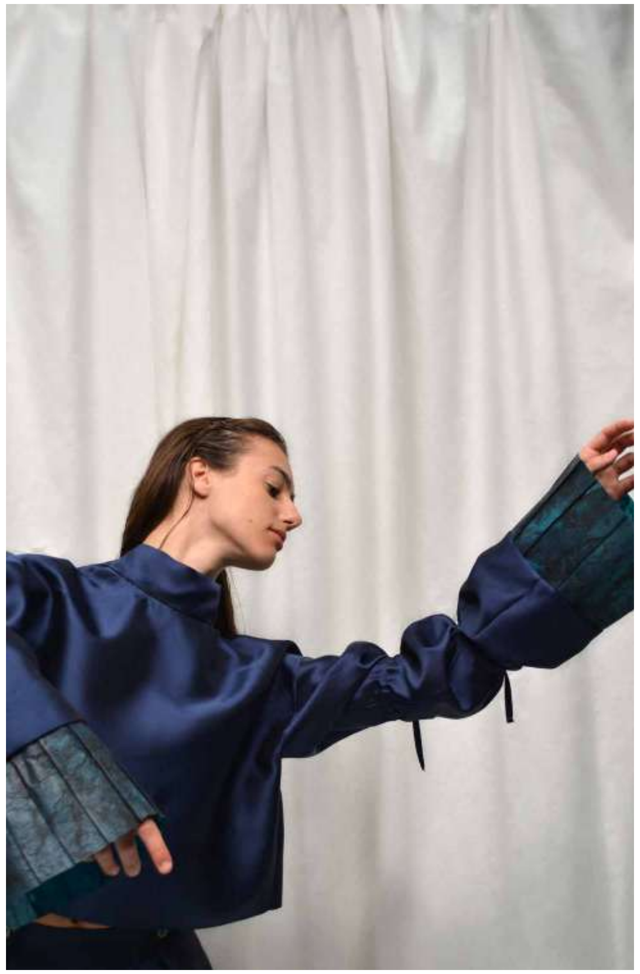
Several BC cultures were initiated during the course of the project, with as many variations in growth mediums. The cellulose formed, which also varied greatly in consistency and aesthetic appearance, was dried in various ways, trying to give it shapes and to integrate other specific components or materials derived from processing waste into it. All this made it possible to collect an abacus of samples that well render the properties of the material and allow for an understanding of its limitations and potential when applied to design outputs.

Due to this type of approach that is strongly based on the expansion of knowledge through the creation of PrArts, De_FORMA's experiments have fostered the creation of products developed according to a conscious and informed approach of material use.

In particular, testing of possible applications led to the creation of two projects that are interesting to mention: a garment made completely in zero-waste logic, in which BC found expression both in parts of the garment and in some of its accessories and elements; and a series of collars, which explored the dimension of fashion tech with BC.

The garment made by Arianna Regaglia (Regaglia, 2022) is characterized by the application of Zero Waste logic at the level of construction and material reuse. The paper patterns are designed to eliminate or minimize the formation of waste from the single-material textile material: in fact, the textile waste generated (about 3% of the total amount of fabric used) was integrated into a BC pulp for the creation of details on the garment and other accessories.

Therefore, BC was used as an element to be integrated into the textile supply chain, becoming a means for the aesthetic-sensory characterization of textiles and expanding compositional and formal possibilities in the creation of zero-waste garments.



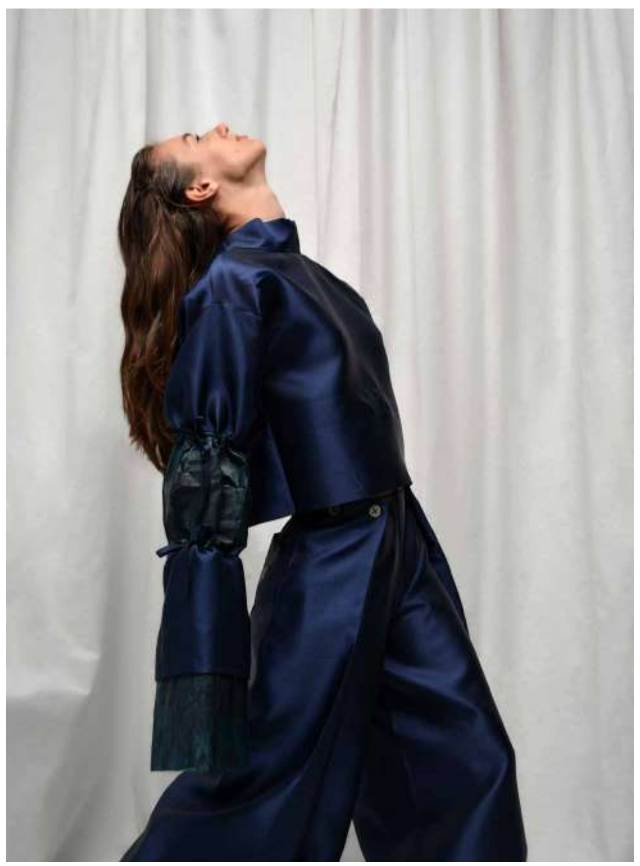


IMAGE 2, 3, 4. Shooting of Re-Growth project realised outfit courtesy of Arianna Regaglia

The result was an outfit composed of outerwear and pants with simple shapes and clean lines, yet presenting an aesthetic related to the nature and innovation inherent in the material.

Another design output that benefited from the experimental results on BC was the collection of three collars for the purpose of investigating the possible applications of this material in fashion tech output. In these collars, the combination of the same elements could result in aesthetically and compositionally different products. For the creation of the various versions of collars, a limited list of ingredients was chosen for consideration to explore how they could find different interpretations in possible shapes and assemblages. In terms of the DF technologies employed in these experiments, both for making the accessories and for giving rise to post-production finishing processes, there are essentially two leading technologies used: laser cutting and 3D printing (FDM).

The first application case involves the use of digital technology to shape material based on BC and textile scraps. Using 3D printing, a mold of variable thickness was produced having the shape of the pattern of a collar. Some finely shredded fabric scraps were combined and amalgamated with a tartare of BC. This material, obtained from scraps of further experimentation, was smeared on top of the 3D-printed geometry. Once dried, the collar was finished by laser cutting along the edges.

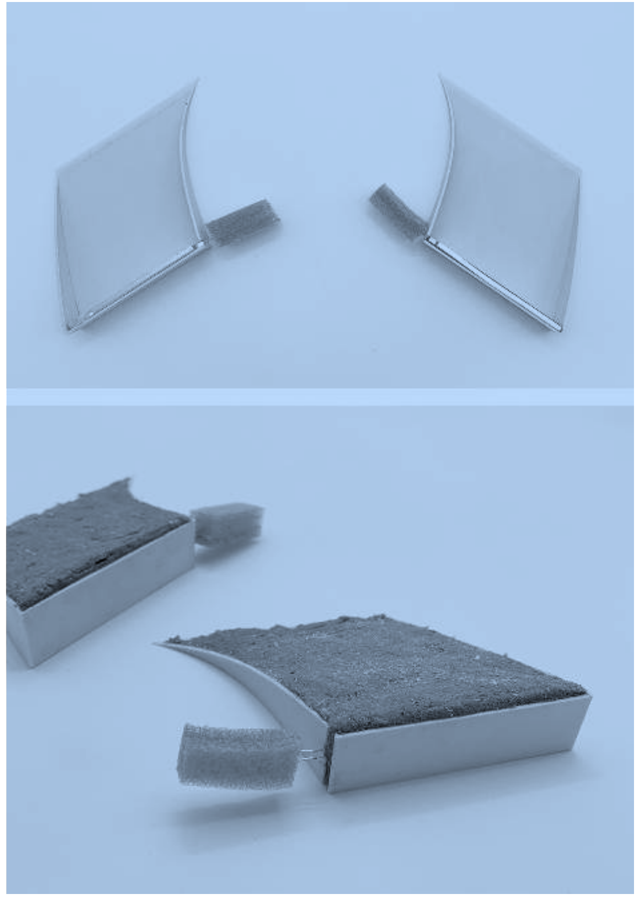


IMAGE 5 & 6. Images of collar components in development.

The second application proposes a collar with the integration of backled and BC parts in synergy with textile material. Using 3D printing, molds were created that could: shape the chopped bacterial cellulose, contain high thicknesses of material, and hold the pair of backled used in place.

The 3D-printed molds were filled with a compound formed from chopped BC and inert waste powders to provide more structure to the material. The parts were then assembled into the laser-cut textile component by following the shape of the pattern. Finally, electronic connections were created using copper tape, and the whole circuit was powered by a button battery placed in a battery holder printed with FDM 3D printing technology.

The latest proposal is that of a collar made from a layer of BC, with parts of BC tartare to hold 6 LEDs for decorative purposes. Through the use of 3D printing and a laser-cut PMMA base, triangular molds were created to shape bacterial cellulose. When completely dried, it was possible to obtain triangles with material texture having precise shapes.

The main body of the collar consists of a layer of BC, laser cut with the shape of the paper pattern of a collar. The electronic components were again connected through a copper tape and powered by a button battery placed in a special housing printed with FDM technology.

IMAGE 7. Overview of three collars integrating fashion tech and digital fabrication

Reflections and conclusions

The dialogic exchange between the world of design and that of applied sciences (Antonelli, 2012; Miodownik, 2007) led national and international research groups to envision a promising environment for growing materials instead of extracting them. While designers have always been involved in the material selection process (Ashby & Johnson, 2013), today, the focus is on creating experimental materials (Rognoli et al., 2015; Sakao & Brambila-Macias, 2018).

With this awareness, although GMs are inherently sustainable as they are renewable and biodegradable (Aquary et al., 2014; Camere & Karana, 2018), current experiments do not consider the production system in terms of circularity, integration and optimization with potential applications.

Through a design case study dealing with the use of biomaterials within the fashion tech research field, this paper aims to reflect on the role of PrArt as learning tools. The process of learning is related to both the school of design and Fab labs, considering them the proper places for developing a reflective practice that involves students as well as designers, makers, and other professional figures, each of them bringing their personal knowledge and expertise.

According to Giaccardi (2019), here we'd like to highlight the meaning that could arise if prototypes are intended as a reflection tool within the whole design process. Considering the design outcome of this project, PrArt creates knowledge, value, and meaning in the specific field of fashion-tech,

IMAGE 8. Material processes

introducing new materials, specific production processes, and the integration with other materials and sensors.

To this aim, we highlight the importance of the functioning prototype, consolidated, implemented and verified through iterative design loops. It is possible to envision the possible integration of circuits equipped with sensors and actuators into BC's already growing layers, overcoming the limitations and complexities given by the realization of connective traces sewn directly onto garments or accessories.

Considering the PrARt as a means for material exploitation, we can identify several trajectories for exploration and innovation to create knowledge and meaning arising from our case study. First of all, the use of the material itself and from the point of view of the production of artifacts and accessories that take advantage of the use of DF during the growing phase. Secondly, the opportunity to customize the material and the growing process according to the possible application, including the hybridization with other materials and sensors. This means a reduction of post-production activities as well as waste materials. We're dealing here with a case study exploration strictly connected to sustainability in each stage of the prototype development, from the production to the reduction of post-production, from the reuse of scraps and waste material to the final disassembly of all the components, such as sensors and electronics.

Considering the PrArt as a means to explore areas of concerns and for provoking alternatives, we can highlight some reflections related to the production process and to the knowledge gathered from the experience. A preliminary reflection may be related to the creation of specific processes, machines and tools to optimize the production of BC intended for fashion field application - or for other fields of application - capable of reducing the resources used for culture starting and avoiding the formation of surface defects in the growing material. In fact, DF makes it possible to materialize any production innovations in a direct manner, drastically reducing the time and resources used for the verification and validation phases of proposed solutions. In addition, another great advantage offered by the DF is its flexibility, which allows it to respond effectively to changes or updates to be applied to the final product or its production process. The use of DF, not only in the laboratory space but also in the production phase, makes it possible to drastically reduce the raw materials used and the consequent production of processing waste.

Finally, the use of BC in the fashion-tech field can be said to be very promising, and the authors plan to continue developing current research to understand the possibilities offered in this area, also checking the possible integration of other technological elements in accessories, and finished garments, as well as extending the fleet of digital machines used.

The activities, results and reflections here presented come from an experimental investigation conducted at Polifactory, dealing with growing, modifying and implementing the bio-material according to a specific field of application: the fashion tech domain. The resulting conclusions offer a critical reflection upon limitations and opportunities given by prototypes intended as research and learning tools within the domain of digital fabrication and bio-materials in product applications towards environmental, social, and cultural sustainability.

IMAGE 9. Collar components in development

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CHAPTER 1

Value driven - Systemic approaches to design

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Innovation processes in distributed textile labs across Europe

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CHAPTER 2

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CHAPTER 3

Uniting ancestral wisdom & contemporary knowledge

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CHAPTER 4

Designing for agency

Provoking Manifesto

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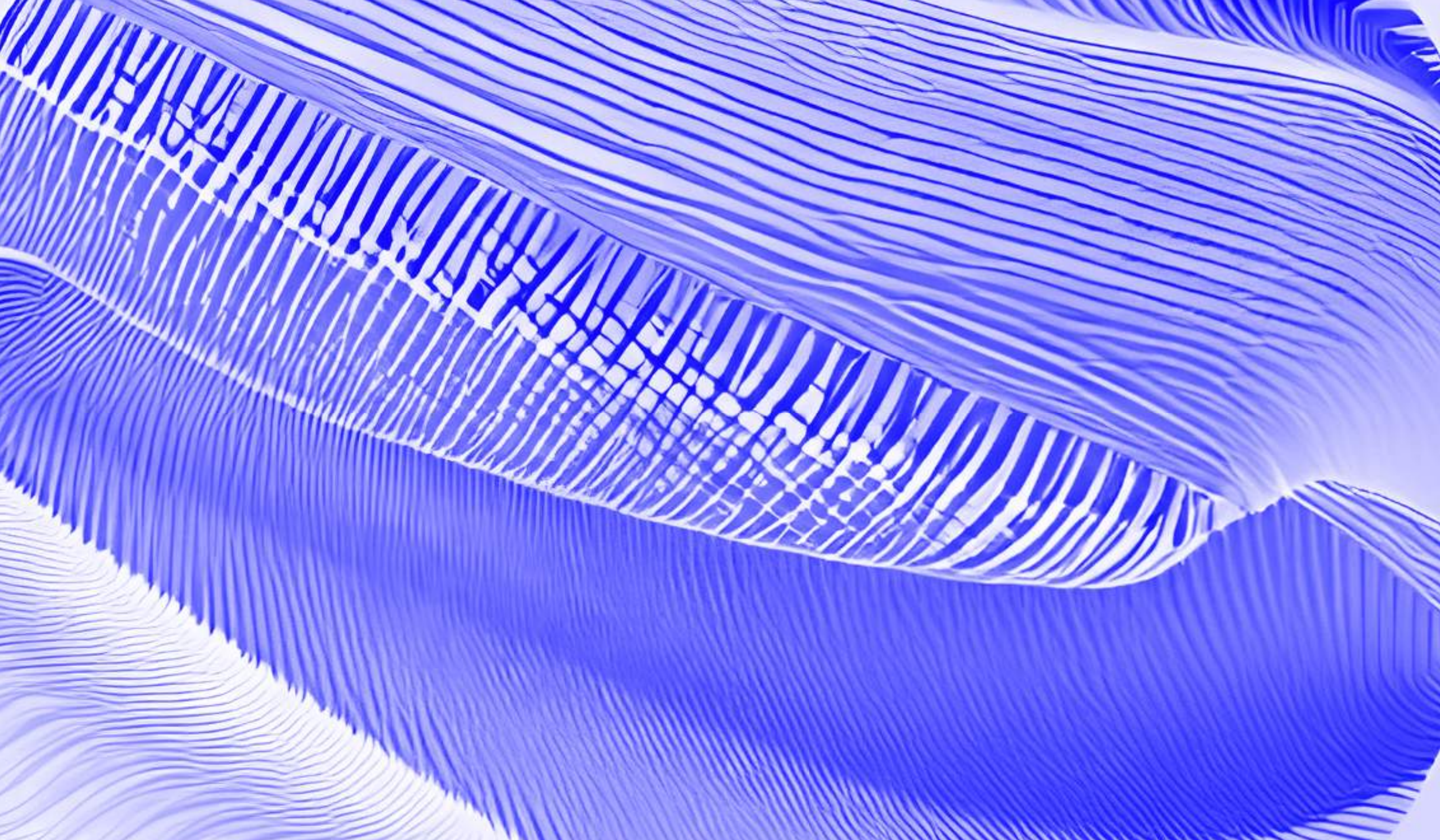

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Driving Design is a non-exhaustive collection of articles, reviews, and profiles that represents and highlights the motivations, opportunities and challenges that drive the practitioners and the field of Distributed Design.

The book curates a collection of works under five umbrella themes, each of which offers the space for the Distributed Design community to share their vision, approaches and areas of exploration to answer who and what are the drivers of Distributed Design.

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