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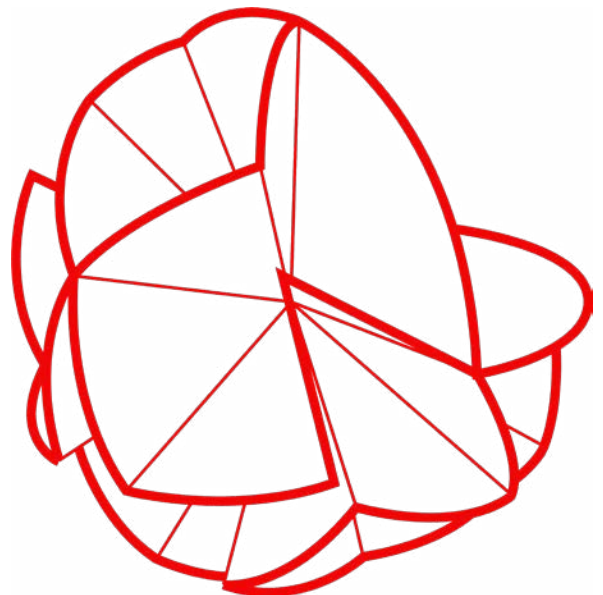
DIGITAL  
SPECIAL  
ISSUE  
1

# Disrupting Geographies in the Design World

Proceedings of the 8<sup>th</sup> International  
Forum of Design as a Process

Alma Mater Studiorum — Università di Bologna

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# Colophon

**diid**  
**disegno industriale**  
**industrial design**  
**Digital Special Issue 1**  
— DSI 1

**Year**  
XXI

diid is an open access  
peer-reviewed scientific  
design journal

diid is published  
three times a year

Registration at Tribunale  
di Roma 86/2002  
(March 6, 2002)

www.diid.it

Print subscription  
(3 issues)  
Euro 60,00  
Subscription office  
ordini@buponline.it

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**Publisher**  
Fondazione  
Bologna University Press  
Via Saragozza 10  
40123 Bologna  
Tel. (+39) 051 232 882  
Fax (+39) 051 221 019  
www.buponline.com  
info@buponline.com

**ISSN**  
1594-8528

**ISSN Online**  
2785-2245

**DOI**  
10.30682/diiddsi23

**ISBN Online**  
979-12-5477-329-1

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**8<sup>th</sup> International Forum of Design as a Process**

# **Disrupting Geographies in the Design World**

**Alma Mater Studiorum — Università di Bologna  
Bologna, June 20-22, 2022**



**Responsible Innovation  
Social Justice  
Ecocentrism  
Changing Education**

**[www.forumdesignprocess.org/dgdw22](http://www.forumdesignprocess.org/dgdw22)**

How design is evolving to respond to the urgent needs facing our environment and society at large? How to understand and design the dynamic relations between artefacts, human beings and the ecosphere? How might design principles and practices adapt their approaches to attend to the diversity that characterised the world?

In an increasingly globalized world, new geographies in and of design offer the stage for negotiating ecosystem's complexity. Design is positioned as a key driver for improving the living standards of many, where human and environmental capitals are pivotal in local economies, and also for the connection to the rest of the world.

The 8th International Forum of Design as a Process (Bologna, June 20-22, 2022) featured speakers from the Global Design community, expanding the original vocation of the Latin Network for the Development of Design as a Process to include researchers and designers of the Mediterranean Area, Middle East, IOR (Indian Ocean Region), and Global South regions. The aim was sharing new perspectives on design futures with responsibility and justice, at the forefront of change, establishing strategic partnerships, and creating accessible knowledge.

The Forum, spanning three-days of meetings, reflection opportunities and networking activities, involved designers, scholars, young researchers, design entrepreneurs, opinion leaders, in an experimental format. Grounded in three pillars – seminars, workshops, and exhibitions –, the event aimed to attract audiences to Bologna, consolidating the potentials of the design world as hub for thought and creative production for present and future generations.

Speakers' contributions inspired the designers' community of practices, and resonated with students and the wide community, to connect design to all aspects of culture and life. This interdisciplinary approach explored the intersections of materiality and culture, post-coloniality, decoloniality, gender studies, and other areas of human thought and action which seek to analyze, question and challenge the disruptive geographies in the world, today.

Five tracks were proposed to address the different dimensions of design futures centered on responsibility and justice.

The submitted papers were reviewed, and a selection is published in this Digital Special Issue of *diid. disegno industriale – industrial design*. Each track begins with a red page containing the original text used in 2022 for the call for papers, also indicating the names of Chairs, Co-Chairs, and Track Editors. Following this, an introductory paper outlines the contents published in the form of research articles for each track.

CONVENORS AND INTERNATIONAL  
ORGANIZING COMMITTEE

# Track 1

## There's No Plan(et) B: Sustainable Transitions to Systemic Planet- Centric Design

Along with the effects of climate change and the social unrest that has spread around the world in the past years, the recent health emergency for COVID-19 pandemic has exacerbated inequalities and injustices at different scales, and has severely tested the resilience of individuals, communities, institutions, and businesses. Current crises, in their multiple manifestations, have exposed the profound instability affecting the planet and brought to the surface many complex situations that require urgent intervention.

In this scenario, design is once again called to reconsider, as a discipline and as a practice, its traditional role towards society and the environment, and to redefine its methods, tools, and processes to offer better solutions for products and services that not only do not harm our surroundings, but also contribute to healing the conflicts that affect both humans and all other beings that inhabit the planet and interrelate as a single living system. The challenge is therefore to encourage and facilitate transitions towards more sustainable and circular patterns of production and consumption, adopting a systemic and planet-centric approach, reinforcing the ethical responsibilities of design, and reaffirming its mediating role in the resolution of the wicked problems that characterise the contemporaneity.

This track invited researchers, educators, practitioners, and students, to share their reflections and experiences concerning design-led processes that bring to the disruption with traditional practices and the transition to alternative forms of thinking and acting, aiming to address current crises and lay the foundations for more sustainable future.

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# Material Resources as a Contextual Complex System

**Michele De Chirico**

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## **Abstract**

To respond to the ongoing cultural, environmental and economic changes, the contribution investigates how sustainable development always refers to the context. It demonstrates how the multidimensional interpretation of resources might lead to sustainable design actions.

The article presents a research project aimed at an original mapping of the presence and use of material resources in local supply chains, in order to rethink their sustainable use through design interventions. According to the definition of “contextual attributes” as a filter of knowledge related to the technical, expressive and cultural aspects that a material brings with it as a resource of a specific context, the research objective is to develop a tool for designers that can help to outline criteria for the knowledge, valorisation and sustainable use of materials by recognising their attributes.

## **Keywords**

Material driven design

Context

Local resources

Sustainability

Know-how



## Design, Materials, Sustainability

The contemporary world requires a rethinking of design theories and practices that might offer proposals compatible with a systemic and sustainable dialogue between companies, design and the territory as a material culture heritage. Specifically, the research trends in design of materials are oriented towards the development of materials that comply with sustainability criteria. There are many design approaches which intercept environmental, social and economic needs, in order to promote tools of understanding and practicability of the paradigms activated by the circular economy (Solanki, 2018; De Giorgi et al., 2020; Pellizzari & Genovesi, 2021; Bak-Andersen, 2021; Brunner, 2021).

When one is seeking to understand the value of materials it is necessary to consider the analysis of their flow within a system defined in space and time (Brunner et al., 2002) and this shows that the origin of raw materials is important: the closer is the source, the more accessible these resources are to the designer. Materials are part of the collective and individual experience and are indicators of the technological level of a society, as well as of its values (Papanek, 1971), emerging as “social actors” (De Giorgi et al., 2020): not elements per se, but connected to society’s history, culture and values, thus determining a reciprocal influence between design actions and the establishment of new models (Zucchi & Collina, 2016).

Sustainable development therefore always refers to the context (Bak-Andersen, 2021), which means that design solutions are needed to support the use of local material resources. This is why it is crucial to explore the opportunities of innovative materials resulting from the optimisation and recovery of resources (Paoletti, 2021), defining design methods and tools to develop transition processes towards a circular economy, in which the understanding of technical and expressive value of materials determines a more sustainable use of resources. In this way, the unexplored potential opportunities of raw materials, production waste and post-consumption materials, can be made evident (Lefteri, 2021; Solanki, 2018; Pellizzari & Genovesi, 2021).

Designers are called to understand this scenario and this is why a material driven systemic design approach for sustainability (Bak-Andersen, 2018) can make the designer aware of the very dense network of multidimensional relationships that a material brings with it, in order to activate true sustainable design processes.

### Learning From the Context

An in-depth knowledge of the context in its natural, social, economic and cultural multidimensionality is fundamental to design in an innovative and sustainable way. Fagnoni refers to “territorial capital, a stratification of know-how and identities, activities and resources, forms of governance and relations, products and landscapes” (2018, p.17): only through such an analysis it is possible to gain an understanding of the territory and to identify real needs and latent needs, as well as strengths and weaknesses, in order to offer new possibilities of action to the design practice and to the territory itself.

By highlighting the potentials of a society, a company, a territory and “enhancing these elements to trigger a change of mentality among people, in favour of social, environmental and economic sustainability” (Tamborrini & Stabellini, 2018, p. 55), it is possible to inspire design innovation.

In response to the ongoing cultural, environmental and economic changes, this contribution presents a research study aimed at mapping the presence and use of material resources in local supply chains, to rethink their sustainable use through design interventions. On the one hand, it can convey the profound meaning of belonging to an unique material culture; on the other, it can enhance positive effects on the territory itself and on production systems.

The project, which began with a research fellowship and is still in progress in relation to a broader research project at Università Iuav di Venezia, aims to develop tools for the generation of knowledge to make evident the as yet unexplored opportunities of the materials. This hypothesis requires a theoretical framework that sets materials at the centre of the relationship between territory and design (Bassi et al., 2021). From such a perspective, materials emerge as part of the collective and individual experience acting as “social actors” (De Giorgi et al., 2020) that can determine a mutual influence between design actions and the establishment of new planet-centric models.

The research objective is to configure a tool for designers, which can contribute to outline criteria for knowledge, valorisation and sustainable use, starting from the recognition of the peculiar qualities of materials. This process aims at interpreting the paradigms activated by the circular economy in order to determine design trajectories that can make evident the unexpressed opportunities of materials.

The tool presented in this contribution would then act as a driver to optimise resources and local supply chains, and to enhance positive effects on the territory itself and on the local production system. Actually, design is the discipline which can interpret technical, economic, social and cultural transformations, coming into close contact with the specific dimension of the territorial context: once the identity of a local production system – in this case the tanning one – has been investigated, designers become the locally enabled terminal through which design affects the processes of competitive enhancement of a single company and of local systems of companies.

## **Mapping the Multidimension**

Two main fields concerning the knowledge of materials can be identified in the literature: one concerns the technical-functional aspects, the other concerns the expressive-sensorial ones (Ashby & Johnson, 2010). While on the one hand the performance of materials is investigated, on the other hand one can explore what materials communicate and evoke in the relationship with users (Karana et al., 2015).

A further interpretative dimension for sustainable design of materials, presented in this contribution, is provided by what we call here “contextual attributes”. It means the dense network of multi-

dimensional relationships in which a material is involved and which makes it necessary to explore a material by analysing it in relation to its context (Solanki, 2018; Bak-Andersen, 2018).

For this purpose, the collective workshop proposed by the author since 2020 to the students of the Materials for Design course, held by professors Alessandro Mason and Riccardo Berrone within the Product and Visual Design curriculum of the Bachelor Degree in Design at Università luav di Venezia, is carrying out a mapping of materials starting from a local geographical recognition, in order to demonstrate how the contextual and multidimensional interpretation of resources can enable sustainable design actions (Bak-Andersen, 2018).

In the first phase of the workshop, a mapping of the students' places of origin was carried out in order to define and visualise the relationships between these places and their material heritages (Fig. 1).

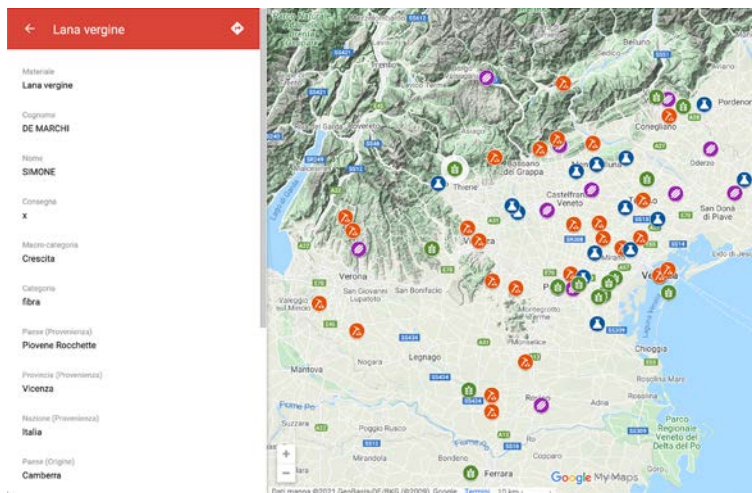


Fig. 1 Michele De Chirico and Alessandro Mason. Università luav di Venezia, Workshop, 2021. A mapping of materials starting from a local geographical recognition. Contextual and multidimensional interpretation of resources can enable sustainable design actions.

The second phase involved the students in a field research – in the Triveneto area – by interacting with producers of materials, in order to investigate the origin of raw materials and the provenance of materials once they became semi-finished, to understand their production processes and technical properties. The study was carried out by collecting information that describes material resources in multidimensional terms: geo-historical, cultural, functional, technical, economic and ecological ones (Bak-Andersen, 2021), so we are dealing with both quantitative data – available from technical datasets – and qualitative data – the result of ethnographic research.

The research showed how these “contextual attributes” can filter the knowledge related to the technical, expressive and cultural aspects that a material brings with it as a resource of a specific context: a material has its own history, characterises a place, transforms a territory in geological as well as socio-economic terms, and has an influence on the people living in that context and on the resulting job possibilities, even before being used as a material for a product design. The investigation of the applications and uses to which materi-

als are employed, also provides further knowledge about the perception and value that users attribute to those materials.

In an early stage, it was necessary to report the researches by documenting them in the form of a booklet, which allowed the presentation of the topics (Fig. 2).

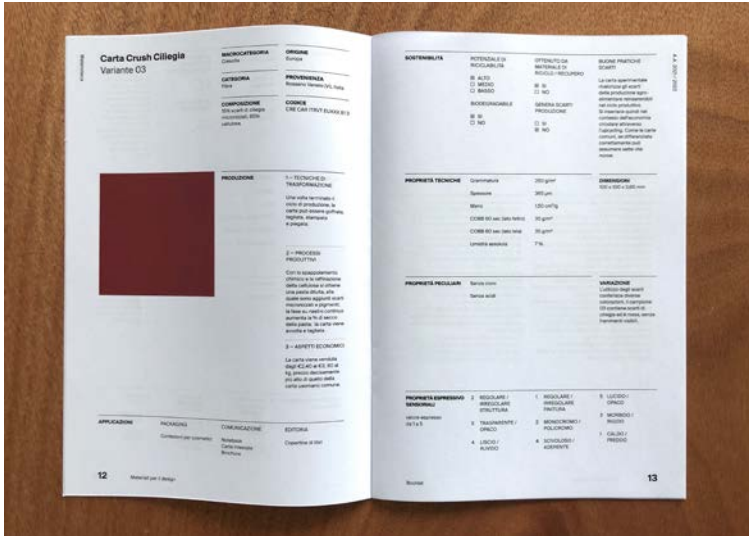


Fig. 2  
Michele De Chirico and Riccardo Berrone. Università Iuav di Venezia, Workshop, 2022. Research reports are documented in booklets. Students: Francesca Affatati, Emilio Dalpane, Loredana Tomat.

In a second stage, all the data was collected in cards – which support the cataloguing of the collected samples – as well as in a dataset useful for the realisation of a visual digital localisation that intercepts information on the provenance and origin of the materials (Fig. 3).



Fig. 3  
Michele De Chirico and Riccardo Berrone. Università Iuav di Venezia, Workshop, 2022. Research data are documented in cards for each material sample. Students: Francesca Affatati, Emilio Dalpane, Loredana Tomat.

An important aspect of the study concerned the mapping of sustainable actions related to these resources, so the potential recyclability of the material was reported; as well as whether the examined

material was biodegradable, or the result of waste regeneration, or materials recycling; and also the type of production waste related to each process phase for each material was reported.

This thinking-by-doing approach confronts us with the need to re-engage in the relationship with matter, to understand what matter itself can suggest. In the experiments, even self-made tools allow us to confront the relationship between abstraction and materiality, enabling us to understand much more quickly the variations in meaning that material can take on. In this way, the designer can bring his or her own specific contribution regarding the use and perception of functions, connections, and relationships between material resource and project.

The third phase of the research concerns, indeed, the design for sustainable management of production waste and was conducted by the author starting from one of the case studies collected and documented by students. The case study concerns the tanning supply chain and, by implementing design trajectories of hands-on experiences as an act of enabling knowledge of materials (Bak-Andersen, 2021), has led the author to the framing of a methodology related to the ways of both organisation and design interpretation of material resources.

### **Tool Prototype**

The development of this methodology is aimed at formulating a tool to overcome the notion of residues as waste, by conveying the semantic value of production residues as resources. Such a semantic transition is driven by their nature as tangible outcome of the metamorphosis of matter, in other words the tangible outcome of the transformations that take place during the process phases of a specific know-how.

The integration of production residues within experimental design processes has been mediated by their expressive-sensorial qualification, an interpretative filter drawn from the studies inherent to the research field of materials experience (Karana, 2010; Del Curto et al., 2010; Rognoli & Levi, 2011; Carullo et al., 2019). Materials experience concerns the meaning of materials as enablers of experiences mediated by the senses and as vehicle of cultural meanings. Actually, material culture can be defined as the transition of the intangible aspects and values of a society onto the tangible world around us (Woodward, 2019). This explains the choice of exploring the meaning of materials through the analysis of the experiential qualities that will be transmitted in a product: these aspects may be difficult to measure, but they are fundamental for the sustainable design of materials as they allow us to appreciate the perception that people will have of that material and the connotations that will be attributed to it (Karana et al., 2015).

Through the identification of design macro-actions and of technological transfers, it was possible to set up many material concepts (Fig. 4) and then the prototype of a visual cataloguing system (Fig. 5), which can convey the valorisation of production waste in the shape of a multi-levels “talking” map (Bruno, 2015): at the same time it is a sensory map as it shows the perceptive pathways and muta-



tions of materials, resulting from the design actions; a time map as it records the succession of the process phases of which production residues are the tangible outcome, and a generative matrix map that proposes a series of suggestions – beyond what has already been described and experimented – which are intended as possibilities of design of materials or of sustainable applications, starting from waste (Fig. 6).

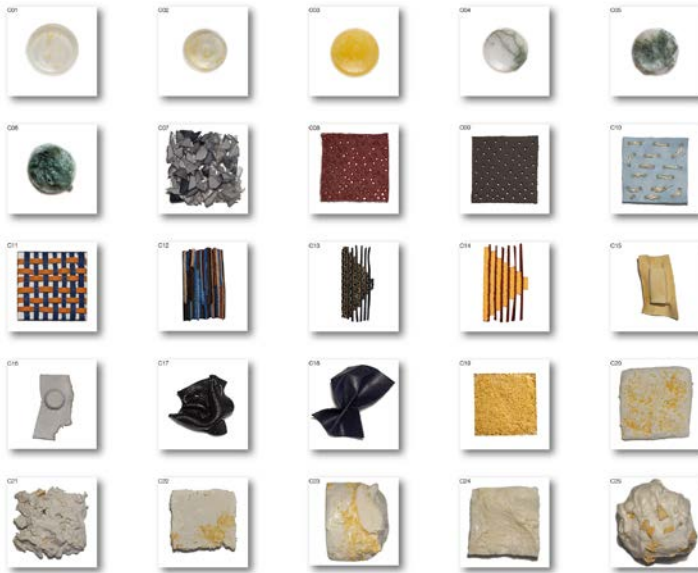


Fig. 4  
Michele De Chirico.  
Università Iuav di Venezia,  
FSE research fellowship:  
*Design for the sustainable  
management of produc-  
tion waste in tanning  
supply chain*, 2021. Mate-  
rial concepts carried out  
through the identification  
of design macro-actions.

### Sensorial attributes

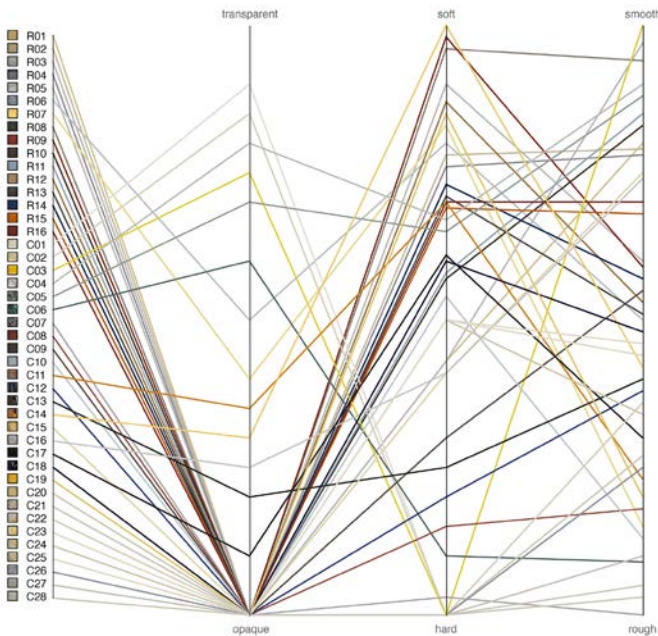


Fig. 5  
Michele De Chirico.  
Università Iuav di Venezia,  
2021-2022. Prototype of a  
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sorial qualification:  
materials as enablers of  
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senses and as vehicle of  
cultural meanings. Data  
visualisation support:  
Jacopo Poletto.

## Multi-level map

soft-hard and smooth-rough

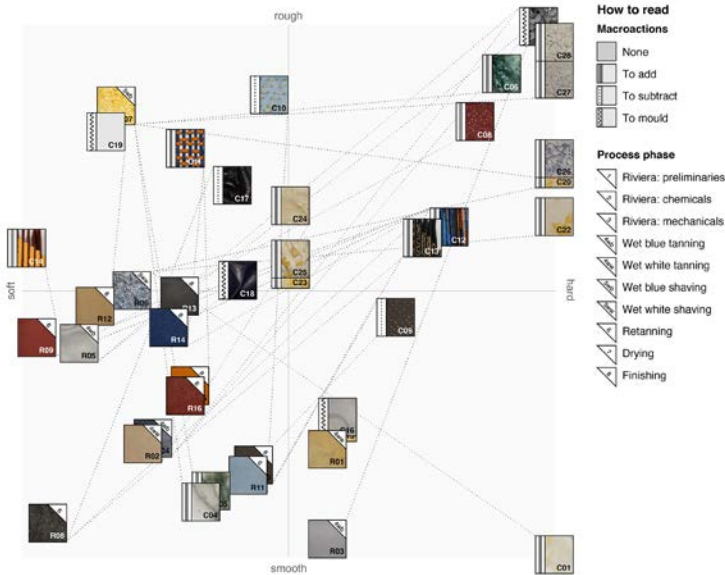


Fig. 6  
Michele De Chirico.  
Università Iuav di Venezia,  
2021-2022. *Talking  
map*, an example of the  
prototype of a visual  
cataloguing system. It is at  
the same time a sensory  
– time – generative map.  
Data visualisation sup-  
port: Jacopo Poletto.

The study allowed us to explore the material as a complex system of relationships, data and information, leading to a deeper consideration on its fields of application in design, including an in-depth study of production processes and the possible use of materials production waste. The systematisation of information led to the generation of multi-levels maps (geographical, sensory, temporal) which can be considered as a prototype of a generative tool for the materials selection, based on multidimensional mapping and storytelling of materials.

The outcomes of the research consist of:

- a cataloguing of 160 materials (each one in 3 different variations) coming from the territorial context of the Triveneto, as well as the basis for a materials library service addressed to design students;
- a resulting cataloguing of the related production residues;
- the prototype of a digital tool aimed at “questioning” the materials and at enabling, on the one hand, their selection and use and, on the other hand, generative processes, that means design intuitions beyond what has already been catalogued or experimented.

The richness of this output lies in its ability to catch and interpret the direct relationship between materials, production processes and territories, by analysing materials not only on the basis of their performance and aesthetic qualification, but as part of a complex system. The map enables a movement in the mutations of matter itself, providing both an “organisation of perception” (Carullo, Del Curto & Lucibello, 2019, p. 152) and an organisation of design possibilities.

By allowing this, the tool is proposed as an interceptor of values such as identity and sustainability of a know-how belonging to a territorial and material culture, whose production waste becomes its legacy and *material* for the project. As a legacy of the metamorphosis of matter through the processes of a specific know-how, they emerge as resources that embody a form of knowledge (Paoletti, 2021).

**Michele De Chirico**  
He is a PhD student in Design Sciences at Università Iuav di Venezia. His research relates to design of materials, focusing on design for the sustainable management of production waste and on materials as contextual actors and cultural meaning-makers.

## Conclusions

The results presented in this contribution represent the first step towards a wide research project which aims at the creation of a multi-level database, on which specific search filters can be applied, and which would lead to a geographically based materials library as an answer to the design students' need to experience the materials. It would be a service through which students would develop the required knowledge about materials, to use them in their projects.

Providing insights and considerations is fundamental for a cultural and behavioural change in which to outline new production and (non)consumption scenarios based on a systemic perspective, in which the *outputs* of one supply chain become the *inputs* of another.

The next steps of the research concern on the one hand the implementation of the multi-level map prototype, in order to simultaneously convey technical, geo-historical and cultural data, as well as information on the environmental, economic and social impacts, and on the other hand the collection upgrade by cataloguing and mapping other supply chains.

The ambition is to go beyond the pilot case related to the tanning supply chain and to test the methodology on other supply chains.

The search for a tool to interpret a well-known scenario currently in transformation can allow designers to reveal the potential of material resources to contribute in the reorganisation of established structures, systems and production economies, in order to redefine our relationship with both natural and socio-economic systems.

The most promising potential of a material driven systemic design approach for sustainability lies in the possibility of opening up new paths to a design-based and deeply cultural change.



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**Published online in September 2023**

The 8th International Forum of Design as a Process, themed “Disrupting Geographies in the Design World” was held in Bologna from 20 to 22 June 2022. The event was organised by the Advanced Design Unit of the Alma Mater Studiorum – Università di Bologna, Department of Architecture, in collaboration with two partner universities: Tecnológico de Monterrey (TEC) and Pontificia Universidad Católica de Chile.

The Forum engaged speakers from the Global Design community, expanding the original vocation of the Latin Network for the Development of Design as a Process to include researchers and designers of the Mediterranean Area, Middle East, IOR (Indian Ocean Region), and Global South regions. The goal was to share new perspectives on imagining design futures in a responsible and just perspective, at the forefront of change, while building strategic partnerships and creating accessible knowledge.

Structured around three pillars — seminars, workshops, and exhibitions — the Forum hosted meetings, reflection opportunities, networking activities. It involved designers, scholars, young researchers, design entrepreneurs, in an experimental format.

Speakers’ contributions not only inspired the practices of the designers’ community, but also resonated with students and the broad audiences. The presentations explored intersections of materiality and culture, post-coloniality, decoloniality, gender studies, and other areas of human thought and action which seek to analyse, question and challenge the disruptive geographies in the world, today.

The papers submitted to the five tracks proposed are published in the Digital Special Issue 1 of *diid. disegno industriale – industrial design*, celebrating during those days its 20<sup>th</sup> anniversary and serving as the fourth partner of the event.

## The Editors

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Andreas Sicklinger, Michele Zannoni

DSI No. 1 — 2023

Year XXI

ISSN 1594-8528

ISSN Online 2785-2245

ISBN Online 979-12-5477-329-1

**DIGITAL  
SPECIAL  
ISSUE**  
**1**



**Bologna**  
University Press