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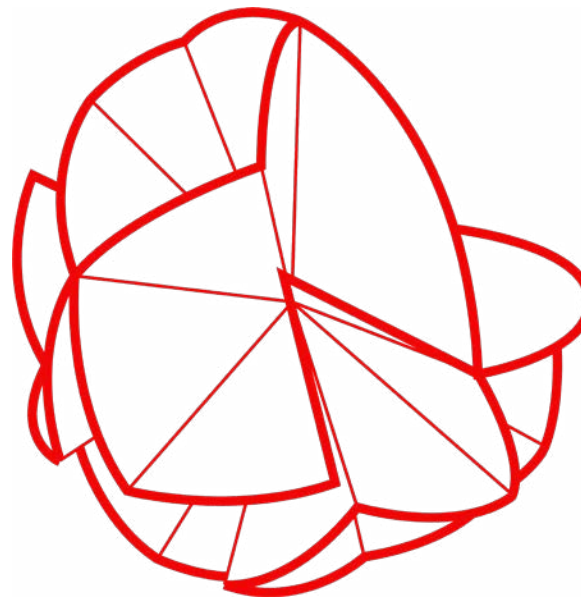
Disrupting Geographies in the Design World

Proceedings of the 8th International Forum of Design as a Process

Alma Mater Studiorum — Università di Bologna



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The Editors extend their sincere appreciation to the following Scholars who served as Reviewers for this Digital Special Issue.

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Contents

Track 1

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

Track 2

Intersectional Design for an Accessible and Empowering World

Track 3

Design and Responsive Technologies for Human Wellbeing

Track 4

Design Values Out of the Mainstream: New Geographies of Influence

Track 5

New Education Pathways for Future Designers in a Changing World

The Latin Network for the Development of Design Processes

The Latin Network for the Development of Design Processes is a group of researchers, academics, students and business professionals of Latin languages and cultures who study and operate in a particular field of design known as design processes. They meet in a Forum, conceived as an international specialised conference, to engage in lively discussions and debates about their studies and experiences.

The Network was founded in 2008 with the “Carta di Torino” manifesto. Since its very beginning, Professor Ph.D. Flaviano Celaschi has been leading a team that, over the years, guaranteed the cultural and scientific focus of the members of the Network, fostering inter-institutional cooperation. Since 2015, the Network has been hosted by the Alma Mater Studiorum – Università di Bologna, within the Advanced Design Unit (ADU) of the Department of Architecture, coordinated by Professor Ph.D. Elena Formia.

So far, the members organised eight Forums, covering the following thematic axes:

Design Cultures as Models of Biodiversity
1st Edition
Universidade do Vale do Rio dos Sinos, Porto Alegre, Brazil
June 24-26, 2009

Design, Art, Craft: Cross-fertilizations and Experiences
2nd Edition
Universidade de Aveiro, Aveiro, Portugal
October 28-30, 2010

Innovation in Design Education
3rd Edition
Politecnico di Torino, Torino, Italy
November 3-5, 2011

Diversity: Design/Humanities
4th Edition
Universidade do Estado de Minas Gerais – UEMG, Belo Horizonte, Brazil
September 19-22, 2012

Advanced Design Cultures. The Shapes of the Future as the Front End of Design-Driven Innovation
5th Edition
Tecnológico de Monterrey, Campus Guadalajara, Mexico
September 18-20, 2014

Systems & Design. Beyond Processes and Thinking
6th Edition
Universitat Politècnica de València, València, Spain
June 22-24, 2016

Design & Territory: Emergencies and Conflicts
7th Edition
Universidad Nacional de Colombia, Sede Palmira, Colombia
June 23, 2020

Disrupting Geographies in the Design World
8th Edition
Alma Mater Studiorum — Università di Bologna, Bologna, Italy
June 20-22, 2022

For more information about the Editions and related publications, see: https://www.forumdesignprocess.org/dgdw22/past-editions/

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The Advanced Design Unit is a community of professors, researchers and experts who deal with design cultures and their continuous innovation. It operates in the University of Bologna through teaching activities, research, and the third mission.

https://site.unibo.it/advanceddesignunit/it

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https://tec.mx/es

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The UC School of Design equips professionals to navigate intricate scenarios, addressing challenges stemming from the ever-evolving landscape of scientific and technological advancements and the socioeconomic and cultural intricacies of the contemporary world. Rooted in the ethical principles of the University, this educational endeavour places particular emphasis on fostering creative intelligence, nurturing critical thinking, and cultivating social sensitivity.

www.diseno.uc.cl

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diid is an open-access, peer-reviewed scientific design journal published three times a year. It was founded in 2002 to fill a gap concerning scientific journals in Italy related to industrial design and design studies. Over the last two decades, *diid* has investigated design disciplines and practices, recording their development thanks to the significant contribution of Italian and international scientific communities. The one inaugurated in 2021, with issue no. 73, is a new phase. The journal, while exploring advanced design cultures, delves into specific aspects such as anticipation, narratives of complex systems belonging to the evolving landscape of capitalism and relational dynamics, the front-end of innovation, the avant-garde of theoretical and applied design debates. The pivotal theme under the lens of analysis is transformation, aiming to comprehend its various impacts and meanings within the realms of innovation domains. With this approach, it aims at overpassing spatial, cultural, economic, and technological boundaries giving voice to design research coming from different areas.

https://www.diid.it/diid/index.php/diid

8th 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

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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.

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A School for Vernacular Algorithm: Cultural Knowledge Transfer as a System and Aesthetic Algorithmic Encounter

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Designing From Within

Paolo Cardini
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Disrupting Geographies in the Design World

Flaviano Celaschi
Alma Mater Studiorum
— Università di Bologna

Realists of a Larger Reality: Cities, Political Imagination and Social Creativity

Gabriella Gómez-Mont
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10 National and International Chairs and Co-chairs

3 International Universities Involved in the Organization

7 National and International Endorsers and Partners in the Activities

138 Long Abstracts Submitted

24 Countries

150 Participants

17 Ph.D. Students and Research Fellow Involved

13 Master and Bachelor Degree Students Involved

13 National and International Students Involved in the Workshop “Strange Wonder”

Design Resistance. Material Solutions for Local Remoteness

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Abstract
Material design and indigenous knowledge are more often intertwined in the contemporary practice of design. Sustainable design is evolving towards discourses that stress the relevance of local interventions and the diverse contribution native cultures can give in shaping post-developed societies. This paper addresses the topic of endemic material design in decentralised areas through Material Driven Design experience by analysing the project called Viral Nature, a material research and design of a composite material able to host vegetal life and attract biodiversity. Originally formulated as a potential design intervention against soil degradation and desertification, nonetheless, the exposure of Viral Nature artefacts to the public showed its potential to be employed as a communicative medium to foster human feelings of environmental empathy. A case study to display a design trend leading toward resistant practices of biointegrated design, to investigate and hypothesise how endemic DIY-Material Design strategies enhance the functionality of the material experience and encourage a change of paradigm towards alternative solutions for the pluriverse.

Keywords
Design resistance
Materials
Local remoteness
Indigenous design strategies
Endemic design

Introduction

The practice of cultural resistance (Arnold, 1869; Gramsci, 1948-51) is embedded in the DNA of material designers. Cultural resistance is fluidly involved with *design resistance* (Haraway, 2016) namely the aptitude of those performing design in complex and/or dire conditions facing the challenges nested in the practice of material design (D'Olivo & Karana, 2021). Due to the context, the practice of material design might need to rely on indigenous narratives and tangible solutions of *Lo-Tek* design (Watson, 2020) that mould the design exercise into endemic design responses. Despite the attention shown to the outcomes of these material praxes – inspired by and intertwined with local knowledge – scarce are the opportunities for the plurality of these works to receive structural support by the local or global infrastructure of production (Rognoli et al., 2011).

In the last decade, with the increase in popularity of the themes of circular and sustainable design, designers have focused on the issues of locality, indigenism and low-tech productions (Ravenscroft, 2021). Isolation, social and physical remoteness, the decentralization of creative forces have steered the direction of the design discourses and its urgencies, which now proceed towards ecologically and eco-systemically driven narratives (Braungart & McDonough, 2008). The decentralization of the design's creative capital has accelerated the shift towards a post-industrial age, whilst the design discipline – evolved relying on politicised, globalised industrial processes – is struggling to technically support the intellectual shift currently in progress, compelling designers to find opportunities and solutions independently through always more frequent Do-It-Yourself (DIY)[1] expedients (Rognoli et al. 2015; Rognoli & Ayala-Garcia, 2021). Designers, therefore, might have to exercise their language with the support of contextual resources, both technical and material, a factor that naturally drives the design discourses towards post-developed scenarios (Escobar, 2015).

The project called Viral Nature is a material research culminated in the design of a biobased material. The design intention behind this work is to formulate an endemic design strategy to enhance the opportunities provided by the context for socio-cultural and environmental improvement, leveraging the experiential and emotional dimension of design to provide a comprehensive perspective on possible futures (Karana et al., 2018). This study focuses on the material research and philosophy behind the project Viral Nature, aiming to clarify the contribution that material design can bring to local regenerative productions and depleted environments.

Material Design for Local Variables

The project Viral Nature (VN), proposes a material instance able to constructively interact with the ecological surroundings following the trend of endemic design; it is the result of a study conducted in and for local contexts. From 'one' to 'many': starting from the issue of soil degradation and desertification in the Mediterranean area, Sicily specifically (Piccione et al., 2009, Cancellieri et al., 2017), a biomaterial medium[2] able to trigger and support vegetal life was devised.

1
Literally the activity of constructing or repairing things oneself; in the design field, this definition might be associated with self-production and experimentation.

2
The phrasing 'biomaterial medium' is used here to indicate the intersection of material design matters with matters related to biological beings and their cycles: a biomaterial is "a substance that is naturally produced, for example by plants or insects, and can be used as a material for making things or as fuel" (Cambridge Dictionary, 2021). In the context of Circular Economy and Bioeconomy "biomaterials" are meant as "materials made of biological resources" (European Environment Agency, 2018). In Biodesign, this definition may be a synonym of "bio-based material" or may refer also to materials made "of, with, or from biology" (Ginsberg & Chieza, 2018). Retrieved on May 6, 2022, from: https://jods.mitpress.mit.edu/pub/issue4-ginsberg-chieza/release/5

diid DSI No.1 — 2023
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Indigenous and scientific knowledge of the ecological/geological heritage of the soil, the local flora and the related agricultural practices informed and validated the research. A fluid process of discerning inspired by a constant dialogue with digital bio-experts, environmental activists[3] and people native of the land helped the designer frame a design vision. Cross-pollination between diverse branches of knowledge – from natural science to art, digital technology and semiotics (Mangano, 2008) – enhanced the communicative language of the material instance. Designing for a specific context presents a series of constraints that narrow down the number of potential shapes the final design proposal could take. Constraints impose on the designer a degree of formal, technical, and material coherence consequential and consistent to the locality of the material context: to implement endemic practices of production into design practices becomes a natural dynamic and the environment can be effectively considered a design partner. This contextual approach has inspired the designer of Viral Nature to adapt the same material solution from 'one' to 'many' different localities, maintaining the indigenous nature of the resulting design.

To design locally means to generate transdimensional reactions to stimuli of various nature, relying on assets available in physical proximity. In the field of material design, this can translate into practices of (1) *material conversion*[4], (2) *material transformation*[5], or (3) *contextual material empowerment*[6], which means respectively 1) to mechanically convert the purpose of matter, 2) to chemically alter the original state of matter, or 3) to allow the material to contextually express a plurality of potential purposes, decolonised by their stereotypical functional identity (Franklin & Till, 2018). The VN case study belongs to the third category.

VN is a material research, and design of a composite material able to host vegetal life, attract biodiversity and self-destruct, sustainably returning to the land. The main goal of the VN material research was to produce a compound hospitable to vegetal life, with a versatile material potential. The narrative proposed, along with the material design, envisioned VN objects integrated into biologically degraded landscapes Fig. 1 working as environmental healing agents (Pollini, B., & Rognoli, V., 2021) by empowering ecosystem resource cycles (Oxman, 2021).

3
While framing the design intention of the project, the designer approached activists who perform what is called 'guerrilla gardening', namely the action of gardening pieces of land that could not be cultivated. 'Guerrilla Gardening', retrieved on May 6, 2022, from: http://www.guerrillagardening.org/

4
Example of material conversion: "Totomoxle", Fernando Laposse, 2019. Retrieved on February 14, 2022, from: https://www.fernandolaposse.com/projects/totomoxtle/.

5
Example of material transformation: "Dross", Bidasaria, 2020. Designboom, retrieved on February 14, 2022, from: https://www.designboom.com/design/dross-project-furniture-formed-metallurgical-waste-materials-07-27-2020/.

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Examples of contextual material empowerment: "Viral Nature" project, 2019. Retrieved on February 14, 2022, from: https://martinataranto.com/Viral-Nature-a-bio-synthetic-material, "An object archive", Lia Raquel Macques, retrieved on February 14, 2022, from: https://liaraquelmarques.com/An-Object-Archive.

7
The concept of "Primary ecological succession" is defined on Britannica, retrieved on February 14, 2022, from:https://www.britannica.com/science/ecological-succession#/media/1/178264/125658.

8
The definition of "Pioneer plants" is described at the page dedicated to the "Primary ecological succession" on Britannica, retrieved on February 14, 2022, from:https://www.britannica.com/science/ecological-succession#/media/1/178264/125658

Fig. 1
Illustrations of the conceptual evolution of the Eco-Viruses implanted inland. Chronologically from left to right. Screenshots extracted from "Viral Nature - The Eco-Virus" video on Vimeo.

Viral Nature Material and Potential Applications

The VN material is composed of a mix of natural fibres, plants and/or flower seeds, and a stone-based binder. The mix is designed to adapt to the diversity of localities, to geography, geology, weather conditions, and biodiversity, but also the designer's proximity to material assets. The material research originally aimed to address the issue of soil degradation and desertification in the south of Italy (Michelangeli et al., 2022; Ferreira et al., 2021). The project relied on the material's bio-receptive properties (Pollini & Rognoli, 2021) to intervene in a disrupted ecosystem by installing 'Eco Viruses' (EV). EVs are unit elements Fig. 2, made of the VN material, potentially able to trigger a primary ecological succession[7] in desertified contexts.

Fig. 2
(Left) Close up picture of the EV; (Right) Eco-Virus sample sprouting while breaking its body structure.

The 'Eco Viruses' have icosahedral shapes; their aesthetic is inspired by the geometry of common viruses and also chosen for its functional reliability in structural stability on uneven surfaces (like those of rough fields) (Pawlyn, 2016): the concept of the eco-virus (antecedent to the pandemic) wanted to convey the idea of a highly contagious benign intervention on pauperised land. Self-sufficient vegetative units are to be disseminated on fields according to need in order to autonomously grow vegetation to spread it in the surroundings, and consequentially rejuvenate the soil. The VN mix is equipped with seeds of so-called *'pioneer plants'*, organisms able to grow in extreme environmental conditions and to spread through the action of wind. Pioneer plants[8] don't rely on pollinators to proliferate, but they are pollinator-attracting plants.

diid DSI No.1 — 2023
Doi: 10.30682/diiddsi23t4i

From pollinators to mosses and earthworms, VN structures are semi-extrinsic bioreceptive objects[9] that can be colonised and colonise their habitat (Pollini and Rognoli, 2021; Guillitte, 1995) evolving, transforming and decaying according to nature's life cycles.

The VN compound can be shaped through moulding into the appearance of sculptural botanical objects Fig. 3. This feature allowed the designer to explore alternative material adaptations, in particular in the field of *material experience* (Karana et al., 2015 a; Pedgley et al., 2021). The designer and the biology of the artefact concur in defining not only the shape, but also the identity of the augmented/living object (Collet, 2013). To fully express its potential transversally, it is crucial to pay attention to the experiential qualities of the material in order to understand the socio-cultural meaning it can be charged with when received by the public (Karana et al., 2015 a).

9
Guillitte defines a bioreceptivity scale identifying three colonization categories: "intrinsic" to the material, "extrinsic" if due to the presence of agents external to the material, "semi-extrinsic" if concurrently due to the characteristics of the material and to accumulation of external media.

Fig. 3
(Left) NumberFourteen, sculptural adaptation of Viral Nature, in its original stage, just extracted from the mould (Beginning of May 2021); (Right) NumberFourteen during the exhibition (End of May 2021), showing clear signs of reactivity to the season.

Designing the Material

The aim of the material research was to obtain a composite material able to support and sustain vegetal life, eventually self-destructing symbiotically with the plants and the land. VN was born out of a happy accident from material experimentation developed in response to the process of *designing through making*. The design process was conducted exclusively through a DIY approach (Rognoli et al., 2015), relying only on proximal resources. After the observation of the unexpected result, a material investigation was initiated following what Karana and colleagues defined as a Material Driven Design Method (MDD), combining material experimentation with *design for material experiences* (Karana, et al., 2015 b). The design of the VN composite was facilitated by the support of a biohacker who experimented on the material to test how it could suffer or benefit from different external conditions. The design choices were regularly submitted for academic approval to meet certain design standards of quality and discussed with a naturalist for scientific assistance. The material studies were also supported by literature review, thanks to desk research on academic databases (e.g. Researchgate, Google Scholar, Scopus), online design platforms (e.g. Dezeen, Domus), and physical exhibitions (e.g., *Broken Nature*, Triennale di Milano, 2019, curated by Paola Antonelli).

Soil degradation and desertification are issues that interest many geographic locations, thus one of the main goals of this research was to find a composition of the mix that could adapt to the diversity of localities, the availability of material means and the kind of intervention needed. This approach was also a necessary expedient since the designer was conducting the material experimentation dislocated from the addressed geographical context and had to allow biological flexibility to the biomaterial in order to be eloquent in different latitudes. In fact, on the basis of the performances expected by the material, a formula of a reprogrammable matrix was devised – a material algorithm that could help with the selection of the material components according to locality. The formula of the matrix was devised to ensure the healthy growth and livelihood of the embedded seeds. In total, 45 material samples Fig. 4 were developed and observed in their behavioural responses to recursive exposure to methodic watering, to constant monitoring of humidity and light exposure, in a set time frame of approximately 3 weeks. After identifying the right ingredients that make the VN mix valid in the context where the first design exercise was performed, the designer proceeded in classifying and defining the archetypical characteristics that the ingredients must have in order to fulfil each technical role within the mixture (e.g., to provide nutrients, to ensure moisture, make space for air, provide structure and brittleness at the same time, perishability, organicity...) in relation to the climatic and geological characteristics of the host environment. This exercise of classification, not only defines the profile of the required ingredients, but also provides: 1) a description of the macro and micro features that a potential material alternative should present, and 2) a method of tuning a material medium with the hosting ecosystem through ecological strategies, when the need of geographical translation of the material employment occurs.

The composite nature of the VN mix and its adaptability open to the possibility of discrete interventions and scalability, which in the field of biomaterials might translate into principles of genetics applied to material design, and therefore to the concept of 'Material Design Genetics'[10] (Tang, et al., 2020).

10
In the addressed context, from 'one' to 'many', with the expression 'Material Design Genetics' is intended a practice of Material Design that is inspired by concepts and processes explicated by genetics. 'Material Design Genetics' is a practice of material design contaminated with and driven by biology.

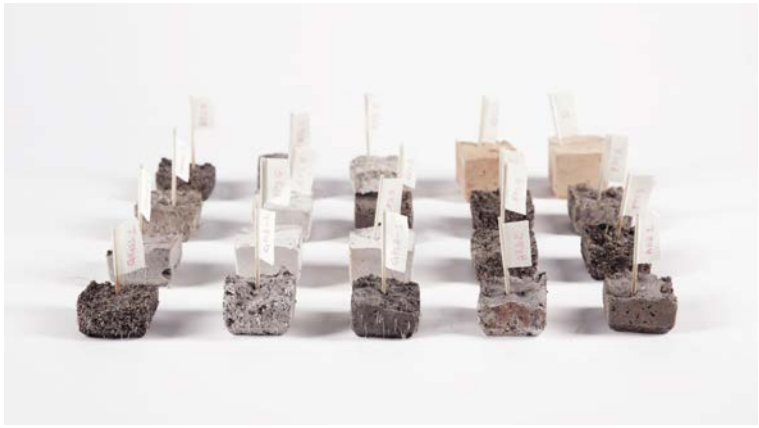

Fig. 4
A selection of the Viral Nature material samples, displaying a visible variety of material combinations.

diid DSI No.1 — 2023
Doi: 10.30682/diiddsi23t4i

Results

Through the experiments conducted by the biohacker it has been verified that, under the favourable environmental condition, the VN material can sustain the natural life cycle of a pioneer plant and self-destruct in the process; on the basis of this attested biological compatibility (Camere et al., 2017) it is possible to imagine employing this material into innovative agricultural practices or as a mean to boost the presence of vegetation in urban spaces. The findings obtained through the VN material study are not exclusively related to the technical performance of the material, but relevant observations could also be gathered on an experiential and emotional dimension of design. Between 2019 and the present day, six sculptural adaptations of the VN material, with diverse but similar semantic and semiotic meanings, have been designed and exposed to the public audience through installations and gallery exhibitions around Europe Fig. 5. The public showcase of VN pieces, in the context of the pandemic, has allowed detecting of an enhanced cross-species empathetic response derived from physical (but also non-physical)[11] interaction with the living critter (Haraway, 2016) compared to the reactions observed in pre-pandemic situations. Similar to what was observed during the 'in lab' phase of the material study, VN objects (particularly in the blooming stage) stimulate inter-specie physical interaction and, with humans, instinctive emotional attachment, not rarely evolving into a mutual relationship of care. The self-destructive property of the material encourages a dialogue on the life expectancy of products and architecture and the concept of design for oblivion[12]. Without opportunities and resources to further develop the technical properties of the material, the designer has driven the project toward a direction that explores experiential and narrative potential.

11
Viral Nature artefacts have been exhibited during the pandemic on online platforms and galleries, like Economia festival and DDW 2020. Retrieved on May 6, from: https://www.youtube.com/watch?v=O-jL4vF4ciC0; https://ddw.nl/en/virtual-tours/11/the-new-intimacy-tour

12
The concept of Design for Oblivion was introduced in the article of "Domus" dedicated to the VN project. Retrieved on February 18, 2022, from: https://www.domusweb.it/en/architecture/gallery/2020/03/16/martina-taranto-design-has-the-right-to-oblivion.html.

Fig. 5
TogetherTwentyTwenty, one of the Viral Nature sculptural application, exhibited at de Bijenkorf (Amsterdam) in February 2020. (Left) Picture taken at the beginning of the exhibition; (Right) Picture taken at the end of the exhibition, after approximately three weeks.

Conclusions

This paper analysed the design process of a bioreceptive semi-extrinsic material compound able to live and positively intervene in the ecosystem in which it is implanted. The material compound was developed through a DIY-Materials approach. The research aimed to investigate the material potential of the VN mix through an MDD experience, designing for local variables through proximal resources. The contextual practice of material design requires designers to eclectically adapt to the circumstances dictated by the material and its native locality. The VN case study shows that it is possible to produce material design strategies specific to one context while remaining generally valid and adaptable to multiple ecosystems. VN artefacts, have, in fact, been grown in different latitudes remaining identifying of the location and fundamentally endemic of the host ecosystem. The concept of a matrix, to be used as a material design algorithm, generates a material design effort resistant to the constraints innate within the practice of endemic design, and committed towards optimising material opportunities in different local remotenesses. The case study analysed in this paper showcases how endemic design strategies can be scaled up, generating multiple design responses with diverse phenotypical characteristics distinctive of different and specific locations. Every VN endemic version for existing requires an interactive network of material design practices, indigenous ecological knowledge and cultural narratives to sync. In the practice of design resistance, never to resist change.

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diid DSI No.1 — 2023
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diid DSI No.1 — 2023
Doi: 10.30682/diiddsi23t4i

DIGITAL SPECIAL ISSUE 1

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 20th anniversary and serving as the fourth partner of the event.

The Editors
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