I.N.S.E.C.T.

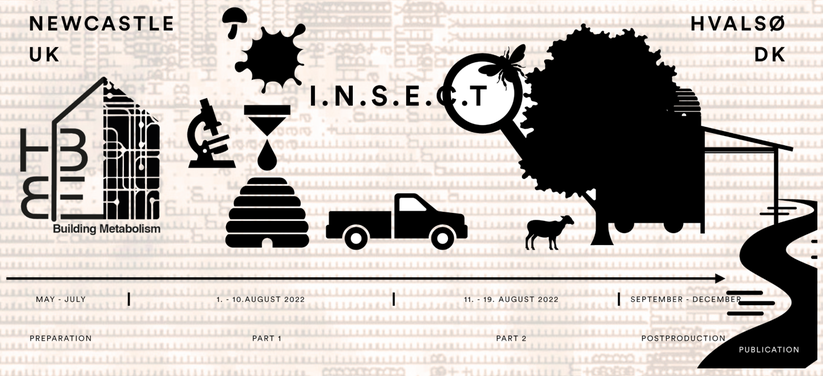
INTERSPECIES EXPLORATION BY BIODIGITAL MANUFACTURING TECHNOLOGIES

This is a living material prototype that lays out a design agenda for designing, thinking, fabricating multispecies and bio-inclusive architectures. We occupied OME of HBBE for the previous 9 days, exploring clay 3D printing, living mycelium, and textiles in order to foster the colonisation of insects and microorganisms. We have built our first prototype that will be incorporated into our everyday built settings, with a focus on insect and microbial life and tested a limited amount of processes that we worked with during the workshop.

As the microclimate is the fundamental link between the physical planning of any habitat (geometry, spatial arrangements, material compositions) and its receptivity to living organisms. Variation of microhabitats, suitable for biodiversity, are formed primarily as a result of microclimate fluctuations. We introduced a material monitoring system to measure the mycelium's response to environmental changes as well as its living habitats, particularly the response of local creatures in their ecosystems to huge mycelium bodies.

OME
NEWCASTLE
UK

PETERSILIE
HVALSØ
DK

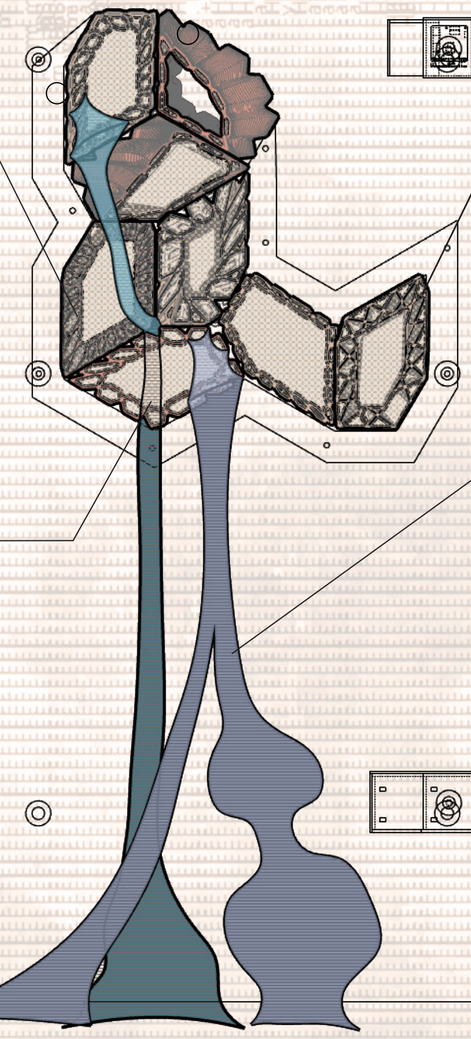




INSECT OCCUPATION



MICROCLIMATE SCENARIO

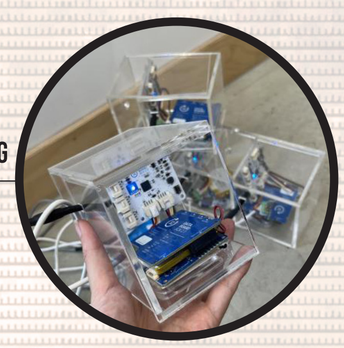




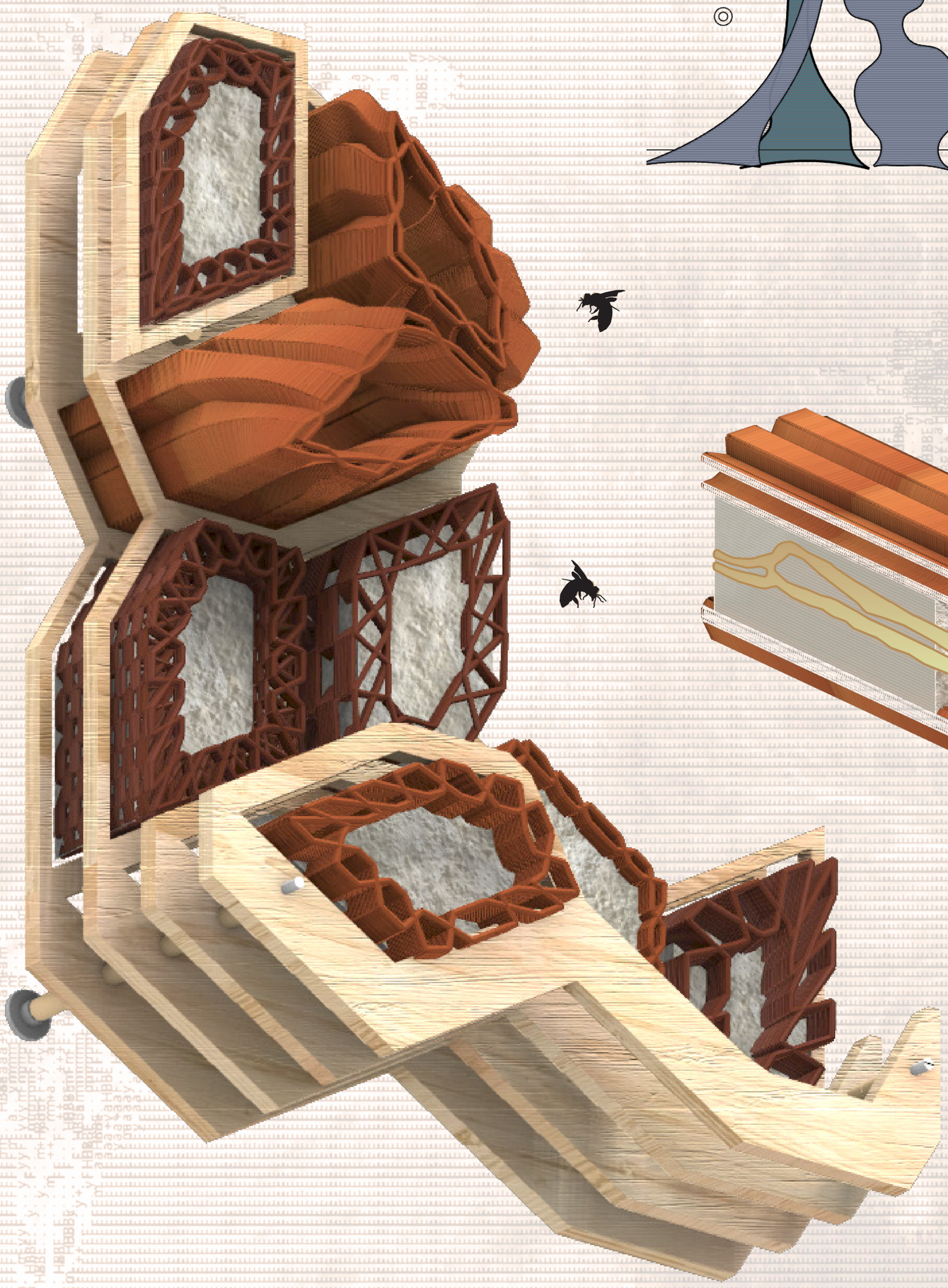
MYCELIUM & CLAY

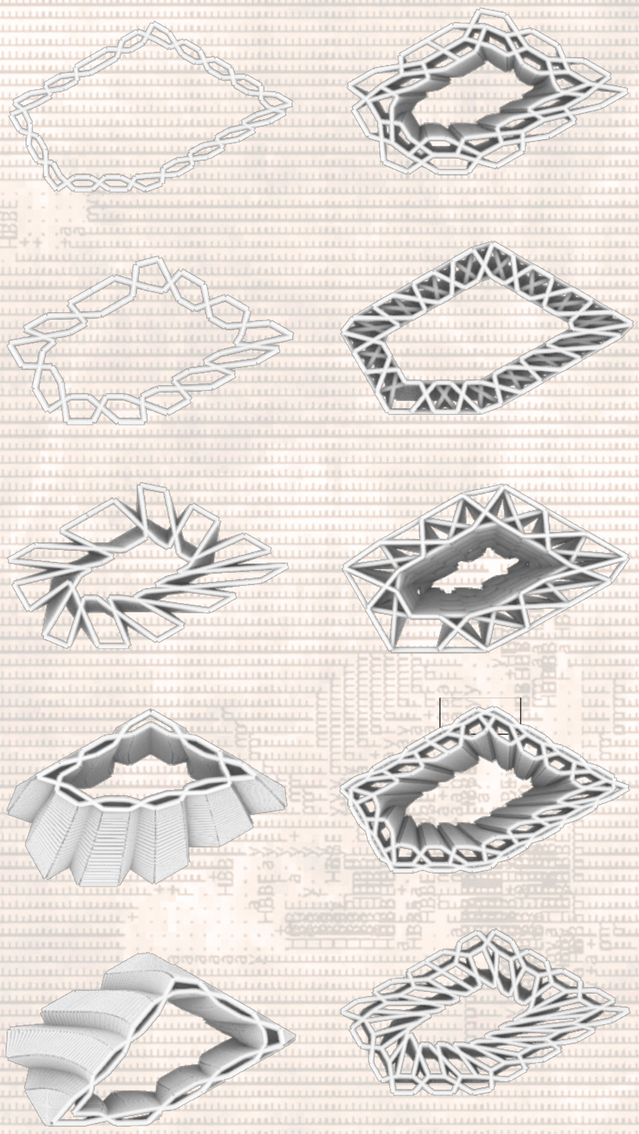


TEXTILE TENTACLES



ENVIRONMENTAL SENSING









artificial life lab

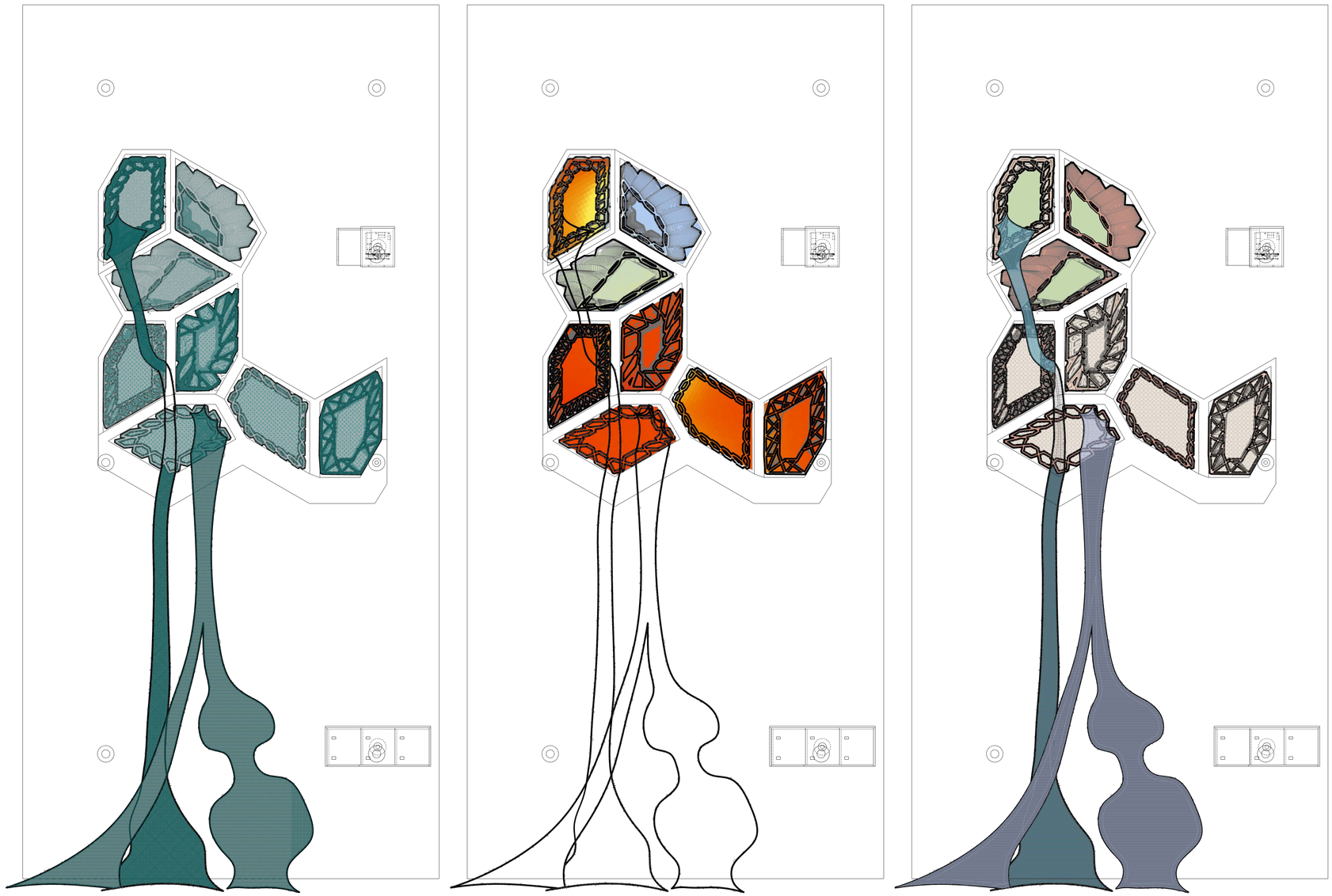
symbiotic spaces

CITA

Hub for Biotechnology in the Built Environment

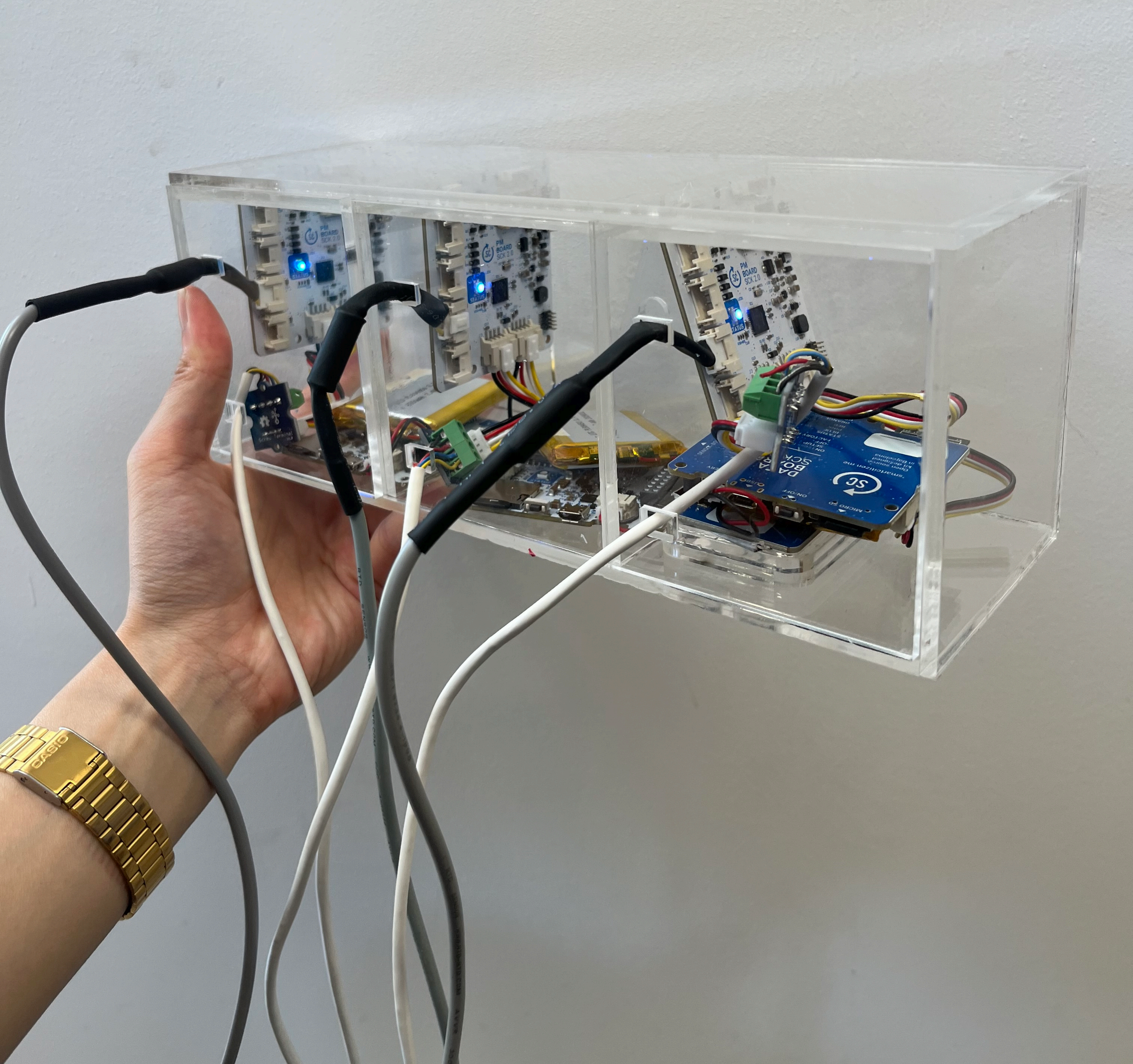
MYCO TECTURE

connected everything.


Ecology
Insect 1
Insect 2
Insect 3
Materials
Mycelium
Unfired Clay
Fired Clay
Textile 1
Textile 2
Biomaterial
Sensors
Moisture Sensor
Temperature Sensor
Air Quality Sensor
Radiance
kWh/m2
100
95
90
85
80
75
70
65
60
55
50
Moisture
<25%
<50%
<75%


GENOME
OME
OME




PM BOARD SCK 2.0
STATUS
CASIO



Abstract for ArcInTex Network Meeting at HBBE, Newcastle, UK
http://bbe.ac.uk/living-textile-architectures-symposium/

INTERSPECIES EXPLORATION BY BIODIGITAL MANUFACTURING TECHNOLOGIES (I.N.S.E.C.T.) WORKSHOP @ OME/HBBE (UK)

The microclimate is the critical link between any habitat's physical planning (geometry, spatial configurations, material compositions) and its receptivity to living organisms. One may argue that microhabitats are formed primarily because of variations in microclimates.

In the first part of the 2-part INSECT Summercamp, we invited 9 practitioners to design and 3d-print an experimental and living material prototype for the OME. In this workshop we explored clay, living mycelium and textiles in regard to creating different microclimates that are inviting the colonization of insects and microorganisms. Our interest is in the complexity of multispecies habitats introduced into our common built environments, with a focus on insect and microbial life. Their significant importance for ecosystem balances and the present decline of insect biodiversity demands that we urgently develop multispecies design ethics, practices, principles, and strategies that include their perspectives.
The extrusion-based 3D printing of clay and a material-oriented digital design method allowed us to design in scales that are closer to the architectural boundaries of insect nests. In addition to the use of digital technology, we have used the different porosity and tectonic possibilities of crocheting to connect the suspended wall twin and it's materiality (clay, mycelium) with the ground.

We see a necessity of stimulating networks of researchers and practitioners to strengthen the field and to advance the current approaches/perspectives regarding using living organisms in a design process, designing for them, together with them, and designing for and engaging in cohabitation. The wall twin is the first physical outcome of the larger I.N.S.E.C.T. framework/community.

Abstract for Biological Fabrication Beyond Tissue Engineering Journal
https://www.frontiersin.org/research-topics/32251/biological-fabrication-beyond-tissue-engineering

Human intervention in the ecosystems has occurred at different scales, such as by creating forests, infrastructures, cities, and materials. Man-made ecosystems risk biodiversity and cause potential problems by reducing the interaction between organisms. Interlacing multi-species keeps the ecosystems resilient. This research questioned how we, as designers, can relate to 'other species' and how our designs can sustain life. We designed, fabricated, and assembled a prototype wall that allows the inhibition of organisms, especially insects, as an alternative to traditional building elements. The prototype was made of 3D printed unfired paper clay, fired clay, mycelium composites, crocheted carded natural wool, untreated flax fibres and multi strand cotton partly dipped in liquid clay. Within this wall, we started to document the effects of various material qualities including porosity, softness, water permeability and thermal conductivity, that can generate different microclimates. Since documenting and analysing the significance of materials on the microbiome is ongoing and will take three months. In conclusion, the prototype will open new discussions on supporting ecosystems and material hierarchies and question if it's possible to tune multi-species interaction through design.



Figure_1: Detailed photographs of mycelium with unfired paper clay, fired clay, only textiles and clayed textiles



Figure_2: Clay modules with various fillings



Figure_3: The whole prototype