PSYCHOTROPIC TOPOLOGIES

Digital Embodiment in Architecture

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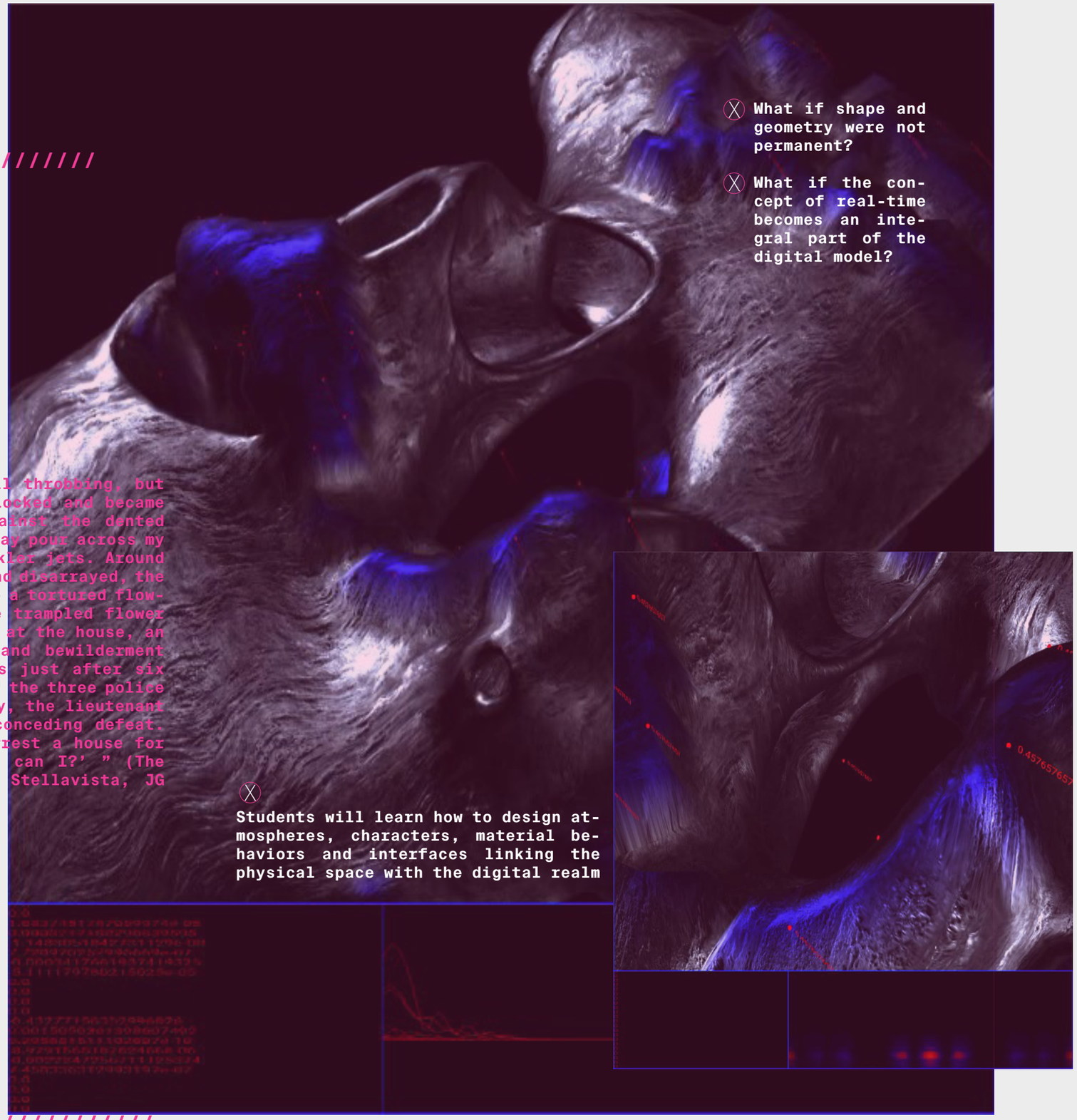
PSYCHOTROPIC TOPOLOGIES

The studio “Psychotropic topologies” displaces our traditional understanding of the body as an isolated and physically delimited site of perception and experience. The aim of the studio is to develop novel strategies for cyber-physical transfers, merging the digital realm of data with the realm of the body and matter.

A global pandemic such as COVID19, shows us the urgency to develop new tools for digital embodiment, remoteness and digital communities. Until now physical spaces and digital spaces remained ontologically and spatially separated. However, current technologies allow a broader range of possible transmissions that can expand our presence and experience. Embodiment is the body’s ability to sense, feel and interact with the environment. This studio uses digital embodiment as a mode to expand beyond the purely physical body to the digital one. This digital embodiment connects us to our digital avatar and enables the creation of a personalized digital environment. This space has the ability to feel, perceive and act while being limited, created and expanded by the physical body.

The studio will ask the students to imagine and generate a digitally embodied space, which physically reacts to their user and thus adapts its spatiality to them. Those spaces will adjust and reconfigure themselves to their residents and visitors. The studio will create a virtual experience by establishing an analogy between digital representation and physiological data collected by the user during its daily routine of confinement. As in the psychotropic building described in JG Ballard’s text “The Thousand Dreams of Stellavista” the house affects its residents mental state, shifting the subject - object dilemma to a “quasi-object” and “potential-subject” storyline. In 1982, Humberto Maturana and Francisco Varela, two Chilean biologist, described the nature of living systems capable of reproducing and maintaining itself. The experience of this house “as alive” can not easily be associated to the performer/audience model(Philip Auslander), but is rather placed as technologically mediated relationship amongst different subjects.

“The house was still throbbing, but a moment later it locked and became rigid. I leaned against the dented wall and let the spray pour across my face from the sprinkler jets. Around me, its wings torn and disarrayed, the house reared up like a tortured flower. Standing in the trampled flower beds, Stamers gazed at the house, an expression of awe and bewilderment on his face. It was just after six o’clock. The last of the three police cars had driven away, the lieutenant in charge finally conceding defeat. ‘Dammit, I can’t arrest a house for attempted homicide, can I?’ ” (The Thousand Dreams of Stellavista, JG Ballard, 1962)



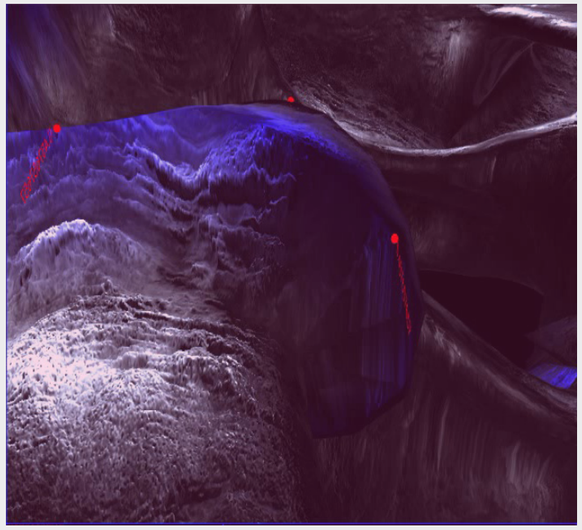
What if shape and geometry were not permanent?

What if the concept of real-time becomes an integral part of the digital model?

Students will learn how to design atmospheres, characters, material behaviors and interfaces linking the physical space with the digital realm

> DIGITAL LANDSCAPE

Current forms of digital interaction are starting to use the body as a control device for human–computer communication. Forms of haptic feedback (notably vibration) are often used to promote a sense of embodiment within digital environment. Within this course we will identify a convergence between everyday bodily actions (pulse, heart rate) and physical activity (step count etc..) with the creation of digital environments. Students will create multi-media spatial prototypes that incorporate natural forms of movement with mimetic sensory devices.
The initial part will cover in detail what is an “psychotropic topography” in general, and techniques for real time data extraction and geometry manipulation. Then we will look at existing different projects that use real time workflows in the field of media art and architecture. In the second part of the summer school, students will venture into using those real time workflows as design tools. You will learn how to integrate different types of media (digital sensors, sound, geometry) into a performance-based space.



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Everyday we will create a data landscape, weaving bodily recorded data to a 3D location in space merging physical and digital reality

We will use amongst others facial recognition,algorithms to learn how we can digitize,emotional data.

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Students will use different sensor systems to control the digital environment, in real-time as well as a mapping over time

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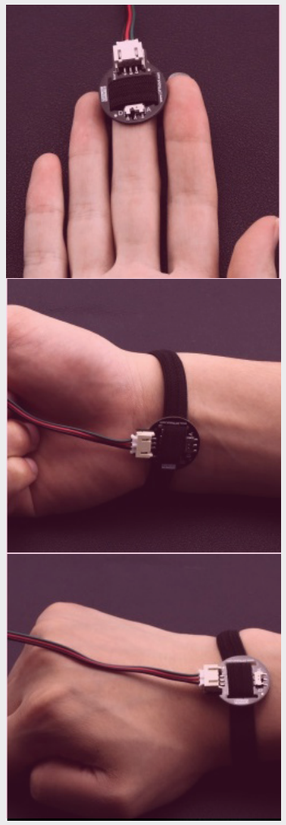
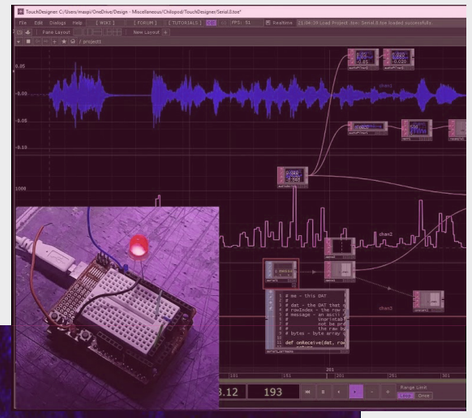


OSC data streaming >

Throughout the course we will look at existing software and libraries such as OSC for real time manipulation, via provided examples and libraries. Some introductory node-based programming tools will be used to experiment with interactive multimedia content. Student will then work in groups to create their own digital landscape and narrative, effectively experimenting first-hand in tweaking sensory data and geometry manipulation.



> TOOLS

In this course, our journey will start with lectures and tutorials that will critically, explore the notion of real-time in opposition to recorded data. The key aim of “Psychotropic Topologies “ will be looking at the role of responsiveness in Architecture and the creation of new types of data workflow and digital matter. In order to address new design challenges and boost participant´s existing software skills, we will use emerging software and technologies already available in the audio visual industry and in the field of machine vision and artificial intelligence.
Students will learn and develop and agile and non-linear design process entangled to a data-informed workflow. They will experiment with different software and tools.

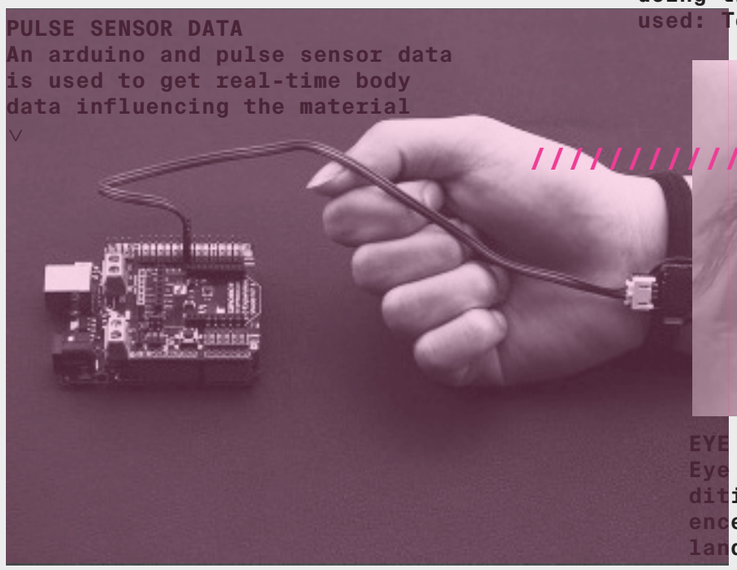
Required Skills: Intermediate ability for Nurbs and Polygonal mesh modeling in Rhino, Grasshopper or Maya, Blender, Houdini is beneficial (but not mandatory).

Required software: Rhino 6 for Windows, Touch Designer, Arduino.

Required Hardware: Sensory kit (will be provided) , Laptop with Webcam or usb webcam.

FACE - TRACKING
Students will use face-tracking to link human emotions with the internal data-structure of touch designer

Each student will work with a sensory kit able to monitor their physiological status. Arduino+-pulse sensor and the webcam from a laptop. Students should record and register different bodily data. This can happen via sensors or by using the webcam/phone. Programs used: Touch Designer, Python.



PULSE SENSOR DATA
An arduino and pulse sensor data is used to get real-time body data influencing the material

EYE TRACKING
Eye tracking will be an additional input used to influence the slow growth of the landscape

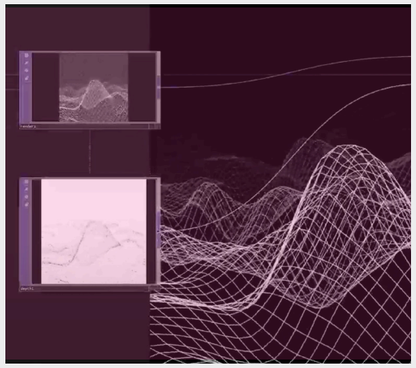
> OUTCOME

Psychotropic Topologies invites students to create a personal spatial articulation embodied with their corporeal and emotional data. The development of the projects will pass from three main areas of investigation:

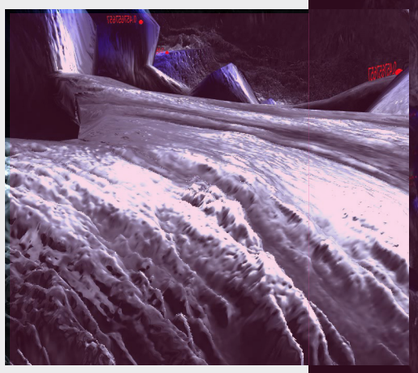
A) Primitive generation : Students will be asked to create a prototypical low-res space, intended and primary spatial articulation.
B) Data Gathering & Substance articulation: How students will decide to collect the data will inform a specific spatial narrative and responsiveness behaviors.
C) Interface visualization: The final spatial resolution will consist of an audio/visual interfaces intended as medium to experience collectively the space and its responsive behavior.

Course Type: Project
Outcome: Group work

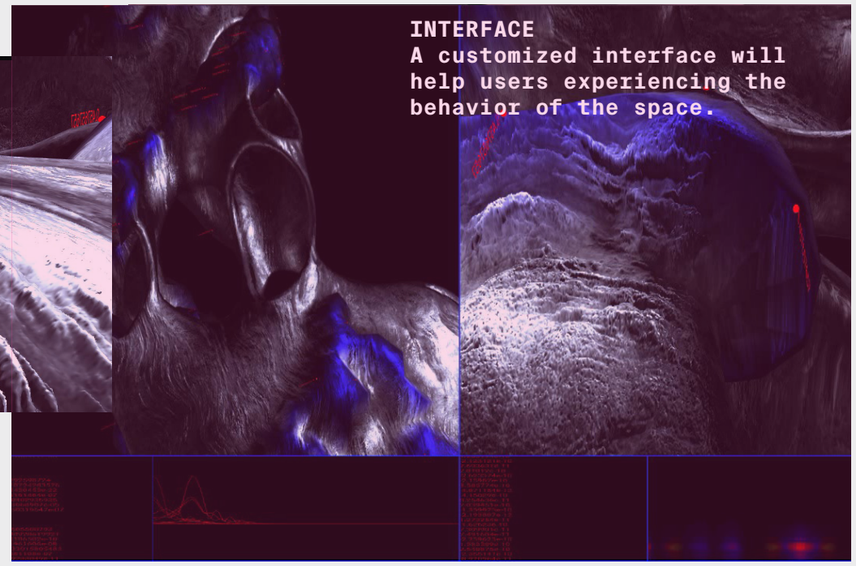
DIGITAL LANDSCAPE
students will use Touch-designer to model a landscape manipulated and generated through their sensor input



PSYCHOTROPIC TOPOLOGIES
students will elaborate in a narrative how these embodied architecture can be in a real architectural setting



MATERIAL SUBSTANCE
manipulation of material on a real-time basis using sensor data.



INTERFACE
A customized interface will help users experiencing the behavior of the space.

> TIMEPLAN

Melbourne	Europe	Monday 6th of July	Tuesday 7th of July	Wednesday 8th of July	Thursday 9th of July	Friday 10th of July	Saturday 11th of July
00:00	16:00						
01:00	17:00						
02:00	18:00						
03:00	19:00						
04:00	20:00						
05:00	21:00						
06:00	22:00						
07:00	23:00						
08:00	00:00	Introduction	Group discussion	Group discussion	Group discussion	Group discussion	On request
09:00	01:00						
10:00	02:00						
11:00	03:00						
12:00	04:00						
13:00	05:00						
14:00	06:00						
15:00	07:00						
16:00	08:00	OSC data tutorial	Tutorial	Group discussion	Tutorial	MIDTERM	
17:00	09:00						
18:00	10:00	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
19:00	11:00	connecting OSC data to Grasshop-per, Touch-de-signer	Group discussion	Tutorial	Group discussion	Midterm de-briefing	On request
20:00	12:00						
21:00	13:00			Presentation			
22:00	14:00						
23:00	15:00						
24:00	16:00						

Melbourne	Europe	Sunday 12th of July	Monday 13th of July	Tuesday 14th of July	Wednesday 15th of July	Thursday 16th of July	Friday 17th of July
00:00	16:00						
01:00	17:00						
02:00	18:00						
03:00	19:00						
04:00	20:00						
05:00	21:00						
06:00	22:00						
07:00	23:00						
08:00	00:00	Introduction	Group discussion	Group discussion	Group discussion	Group discussion	Group discussion
09:00	01:00						
10:00	02:00						
11:00	03:00						
12:00	04:00						
13:00	05:00						
14:00	06:00						
15:00	07:00						
16:00	08:00		Production Tutorial	Group discussion	Production Tutorial	Production Tutorial	FINALS
17:00	09:00						
18:00	10:00	Dinner	Dinner	Dinner	Dinner	Dinner	Dinner
19:00	11:00	On request	Production Tutorial	Production Tutorial	Production Tutorial	Final test run	Closing session
20:00	12:00						
21:00	13:00						
22:00	14:00						
23:00	15:00						
24:00	16:00						

> BIO

Daniela Mitterberger (MAEID)
Is an architect and researcher with a strong interest in new media, the relationship between Human/Body, Digital Fabrication and Emerging Technologies. She is co-founder and director of MAEID “Büro für Architektur und transmediale Kunst”, a multidisciplinary architecture practice based in Vienna. Currently, she is a Ph.D. researcher at ETH Zürich, Gramazio Kohler Researcher, focusing on intuition in digital design and robotic fabrication. Previously she was a lecturer at several international graduate and postgraduate programs, amongst others at the University of Melbourne (MSD), University Innsbruck and the Academy of Fine Arts Vienna. e Co-founder and Director-where she graduated from the Academy of Fine Arts Vienna with distinction.

Tiziano Derme (MAEID)
is an architect, media artist director and co-founder of MAEID “Büro für Architektur und transmediale Kunst,” an interdisciplinary practice based in Vienna. He is an Assistant Professor and PhD fellow at the University of Innsbruck with the chair of Marjan Colletti at the Institute für experimentelle architectkur, with a research into applied computation to bio-fabrication, robotics and material performativity. In 2019 Tiziano was selected as an emergent media artist within the Creative Europe framework and previously had the chance to teach at several international graduate and postgraduate programs. Currently Tiziano is also a researcher at the University of Applied Arts Angewandte, co-leading an FWF PEEK project from the title “Co-corporeality”.

Andrea Reni (MAEID)
is a researcher and computer scientist with a degree in Mathematics, generally interested in exploring unconventional applications of technology and science. His work is mainly focused on generative softwares where the machines are in control of the outcome and the human is just the curator. He investigates both video and audio, creating interactive and immersive sceneries. He works with the figurative and the abstract, exploiting the aleatory and data manipulating capabilities of computers.

He currently collaborates with different agencies and galleries on commercial and artistic projects.