FABRICADEMY PROJECT PROPOSAL PRESENTATION

PITCH DECK

Interactive Garden

2025-2026

A living interface between plants, humans, and biodata

CARLOTTA PREMAZZI

ABOUT ME

PITCH DECK

CARLOTTA PREMAZZI cpdesignstudio.com

Multimedia Designer/Artist & Visual Live Performer
Tech-Empathy Artist
Hybrid-Interactive-Neurofeedback Art

PITCH DECK

FABRICADEMY PROJECT PROPOSAL PRESENTATION

TITLE

PROJECT OVERVIEW (ABSTRACT)

REFERENCES & INSPIRATIONS

ACADEMIC TRENDS

FIRST-PERSON RESEARCH

WHAT (PROJECT DEFINITION)

WHO (STAKEHOLDERS & USERS)

WHY (MOTIVATION & RELEVANCE)

HOW (METHOD & APPROACH)

PSS

PROTOTYPES & EXPERIMENTS

SYSTEM DIAGRAM

WHEN TIMELINE

EXPECTED OUTCOMES

CLOSING / FUTURE

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OVERVIEW

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Interactive Garden

is an immersive installation where **real plants** express their health through **soft robotic flowers** that bloom in response to **biodata**. **Human biofeedback**, such as heartbeat, can subtly influence the environment, creating a **multisensory dialogue** between visitor and plant. The system forms a **responsive ecosystem** shaped by soft materials, sensing, and interaction.

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KEYWORDS

General

Multisensory Interaction, Human-Plant Communication, Biofeedback Systems, Soft Robotics, Responsive Ecosystem, Biophilic Design

Mood

Immersive, Meditative, Visionary, Symbiotic, Wonder

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REFERENCE& INSPIRATION

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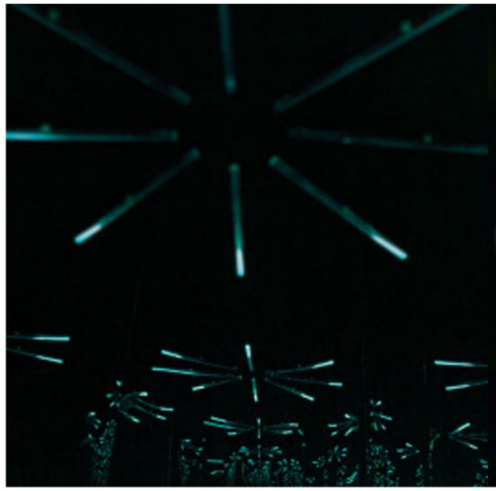
Studio Drift
Shylight

PNAT Project Nature
The Hidden Plant
Community

Philips
Bio-light



One Luminous Dot
Teresa Van Dongen

Studioroosegaarde
Glowing-Garden

ecologicstudio
H.O.R.T.U.S. XL
Astaxanthin.g

Plant Intelligence & Plant Signaling

- Brenner ED, Stahlberg R, Mancuso S, Vivanco J, Baluska F, Van Volkenburgh E. Plant neurobiology: an integrated view of plant signaling. Trends Plant Sci. 2006 Aug;11(8):413-9. doi: 10.1016/j.tplants.2006.06.009. Epub 2006 Jul 13. PMID: 16843034.
- Plant Signaling & Behavior, Volume 20, Issue 1 (2025) Taylor & Francis Online: Peer-reviewed Journals

Multispecies Interaction & More-than-Human Design

- Giaccardi, Elisa & Redström, Johan. (2020). Technology and More-Than-Human Design. Design Issues. 36. 33-44. 10.1162/desi_a_00612.
- Haraway, Donna J. (2016), Staying with the Trouble: Making Kin in the Chthulucene, Durham: Duke University Press.

Soft Robotics & Biomimetic Systems

- Soft Robotics Journal (MIT Press)
- Biology and bioinspiration of soft robotics: Actuation, sensing, and system integration, Ren, Luquan et al, iScience, Volume 24, Issue 9, 103075

Biofeedback & Physiological Computing

- Kandel E., Schwartz J. H. , Jessell T. M. , Siegelbaum S. A. , Hudspeth A. J. , Principles of Neural Science , Fourth Edition, McGraw-Hill, 2013
- Buzsáki G., Rhythms of the brain , Oxford University Press, 2006
- Nijholt A., Contreras-Vidal J.L., Jeunet C., Väljamäe A., Brain-Computer Interfaces for Non-clinical (Home, Sports, Art, Entertainment, Education, Well-Being) Applications , Frontiers in Computer Science, 2022
- Nijholt, A., Brain Art Brain-Computer Interfaces for Artistic Expression, Springer, Cham, 2019

Immersive & Multisensory Interaction Design

- Löwgren, J., & Stolterman, E. – Thoughtful Interaction Design, 2007, The MIT Press
- Anna Ståhl, Madeline Balaam, Rob Comber, Pedro Sanches, and Kristina Höök. 2022. Making New Worlds – Transformative Becomings with Soma Design. In Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 176, 1–17. https://doi.org/10.1145/3491102.3502018

WGSN FUTURE COSTUMER 27 EMOTIONS

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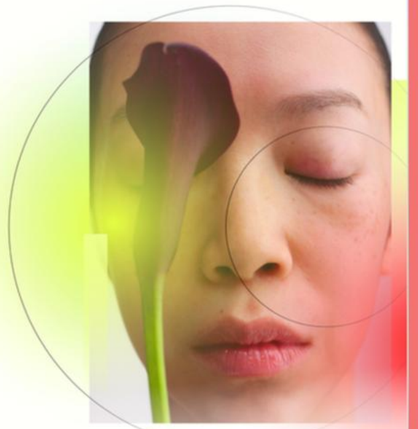
WGSN

Future Consumer 2027:

Emotions



WGSN ensures the world's leading brands create the exact products that tomorrow's consumers will buy

Strategic Joy

This emotional state couples joy with purpose, and it will be a reaction to feelings that have dominated the last few years – prolonged stress, boredom and dysregulation (an inability to control emotional responses as a result of feeling too many of them at once).

Strategic Joy

Building on our previous forecasts of Awe for 2024, Imagination for 2025 and Glimmers for 2026, **Strategic Joy** will emerge in 2027 as the natural next step, as consumers and businesses embrace play in pursuit of self-discovery, connection, inspiration and inclusivity.

Cultivating joy is not only good for personal health – it's also good for business health: in a survey of more than 2,000 Australians and New Zealanders, **almost six in 10** said playful or humorous brands made them feel better about a company or organisation, and in the US, unhappy workers cost firms **$1.9tn** in lost productivity in 2023.

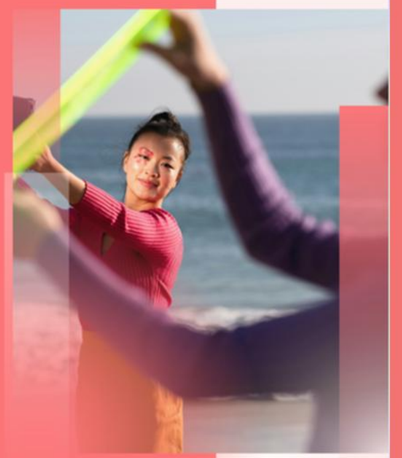
In 2027, the power of play will inspire people to embrace positive habits and mindsets. Expect to see a bigger focus on collective effervescence (the shared positive feeling felt at crowd events) and healthier or more mindful habits and experiences such as train travel, which has been **linked** to greater happiness.

Play will also help consumers move from a mindset of 'what is' to 'what if?' and experiment with new boundaries, reimagining the world not only through AI but also KI (kid intelligence, which cherishes the virtues of childlike wonder). Consumers will also embrace pleasure activism, and they will turn inward to prioritise their wellbeing and serenity. Brands have a golden opportunity to support consumers in these quests.

Strategic Joy

in action

Three key consumer emotions will shape the state of **Strategic Joy**: feeling **dysregulated**, **stressed** and **bored**. As global challenges mount, these feelings will demand evolved mindsets and imaginative solutions, moving consumers toward three aspirational emotions: feeling **included** in a broader cultural narrative, feeling **serene** amid chaos, and becoming deeply **inspired** by the world. These emotional goals will set the tone for future creative endeavours that are as strategic as they are joyful.



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FIRST-PERSON RESEARCH

- Embodied ideation
- Autobiographical design
- Experiments perceiving plant-human rhythms
- Material & Sensory Explorations

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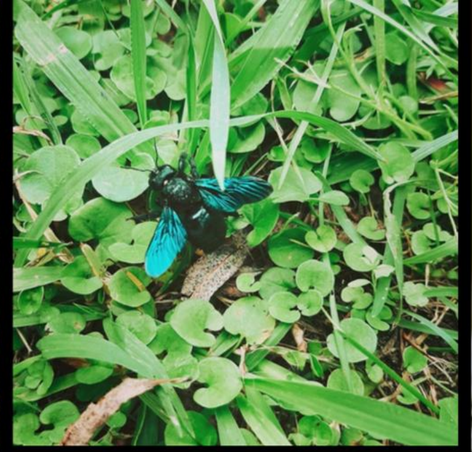

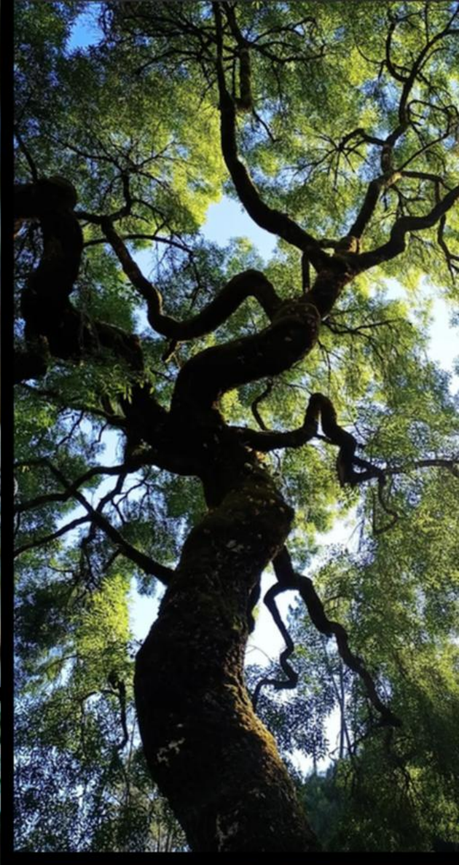

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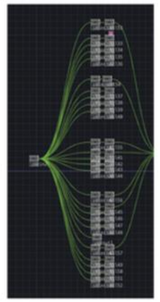

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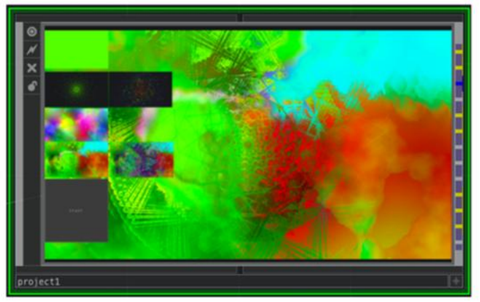
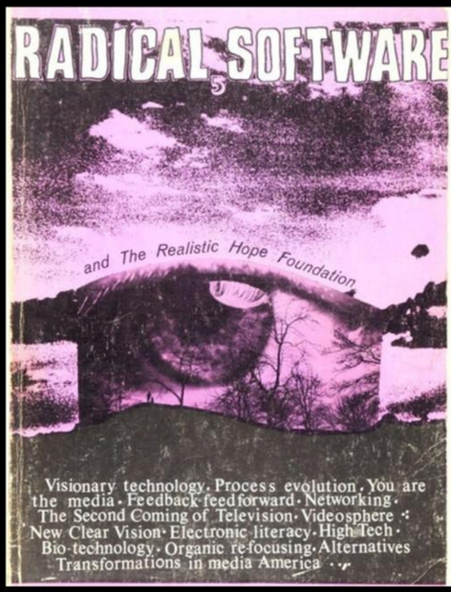
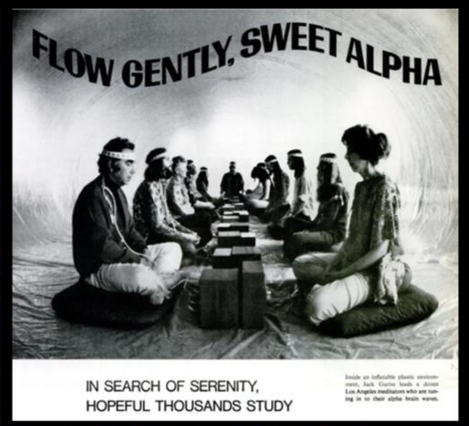
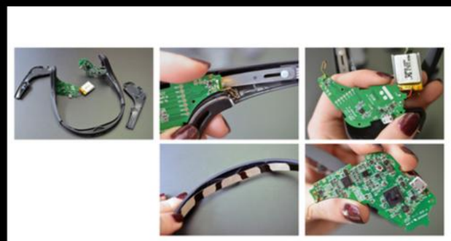
BioData

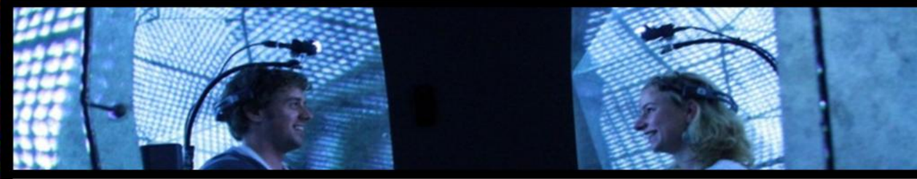


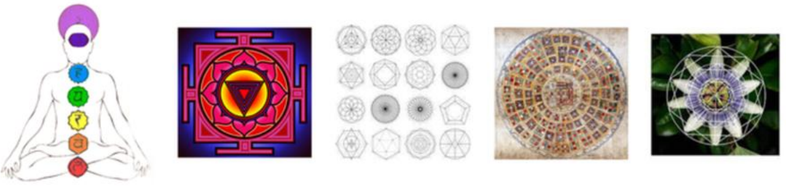
Output Panel Video Project

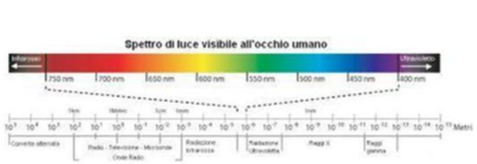












Interactive Garden: An Immersive & Responsive Ecosystem

Core Mechanism
(Autonomous Function)

Real Plants & Biodata
(Soil Moisture Sensors)
- Sensors read plant biodata.

Thrive Signal

Processing & Control
(Invisible Biological Processes)
- System analyzes data.

Trigger

Pneumatic Silicone Flowers Bloom
(Tangible Gesture)
- A dynamic, playful visual display.

Human Interaction Layer
(Symbiotic Dialogue)

Modulates System

Human Presence & Biofeedback
(Heartbeat/EEG)
- Subtle modulation of the environment.

Fosters Symbiotic Dialogue & Enriches Environment

Design & Future Vision

Soft, Modular & Flexible Components
Soft robotics, environmental sensing.

Invites Contemplation & Presence
Awareness of slow rhythms of living organisms.

Future Iterations: Bioluminescent/Fluorescent Materials
Enhance atmospheric and poetic experience.

WHAT

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Immersive Ecosystem

An immersive ecosystem where:

- plant biodata → soft-robotic blooming, sound modulation
- human heartbeat → soft-robotic blooming modulation, sound modulation

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WHO

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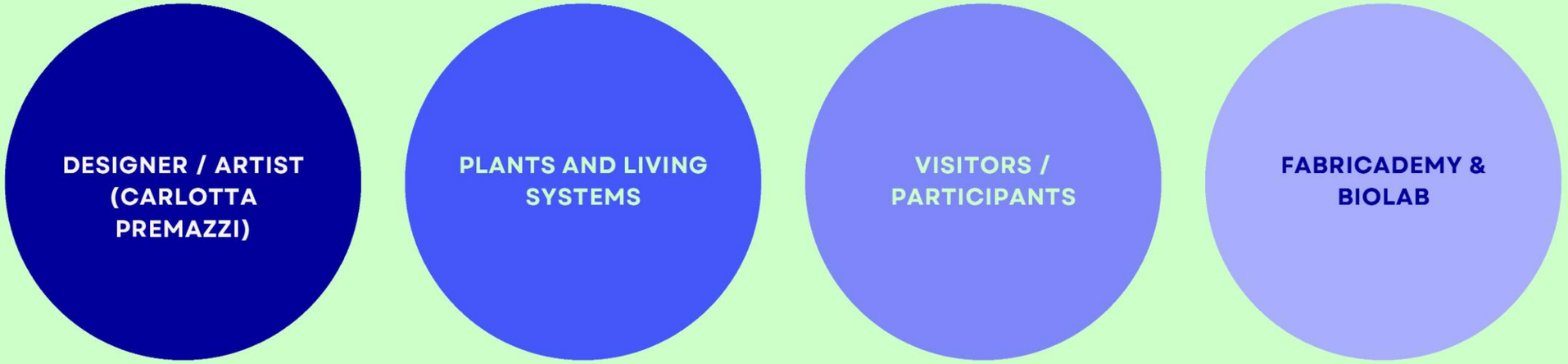

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CURATORS
MUSEUMS

- FUNDAÇÃO EDP / MAAT – MUSEUM OF ART, ARCHITECTURE AND TECHNOLOGY (LISBON)
- FUNDAÇÃO CALOUSTE GULBENKIAN & INSTITUTO GULBENKIAN DE CIÊNCIA (LISBON)
- FUNDAÇÃO MILLENIUM BCP (LISBON)
- ESTUFA FRIA DE LISBOA – CÂMARA MUNICIPAL DE LISBOA
- GNRATION (BRAGA)
- V2_ LAB FOR THE UNSTABLE MEDIA (ROTTERDAM, NETHERLANDS)
- BALTAN LABORATORIES (EINDHOVEN, NETHERLANDS)
- NEMO SCIENCE MUSEUM / MEDIALAB (AMSTERDAM, NETHERLANDS)
- MUSE – MUSEO DELLE SCIENZE (TRENTO)
- FONDAZIONE PRADA (MILANO / VENEZIA)
- PIRELLI HANGARBICOCCA (MILANO)
- TRIENNALE MILANO – MUSEO DEL DESIGN

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CULTURAL INSTITUTIONS

- **FUNDAÇÃO EDP / MAAT – MUSEUM OF ART, ARCHITECTURE AND TECHNOLOGY (LISBON)**
- **FUNDAÇÃO CALOUSTE GULBENKIAN & INSTITUTO GULBENKIAN DE CIÊNCIA (LISBON)**
- **FUNDAÇÃO MILLENIUM BCP (LISBON)**
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- **V2_ LAB FOR THE UNSTABLE MEDIA (ROTTERDAM, NETHERLANDS)**
- **BALTAN LABORATORIES (EINDHOVEN, NETHERLANDS)**
- **FONDAZIONE PISTOLETTO CITTADELLARTE, UNIDEE CONNECTIVE RESIDENCIES 2025-26**
- **FONDAZIONE PRADA (MILANO / VENEZIA)**
- **PIRELLI HANGARBICOCCA (MILANO)**

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ART FESTIVALS

- ARS ELECTRONICA (LINZ, AUSTRIA)
- SÓNAR+D (BARCELONA, SPAIN)
- OFFF (BARCELONA, SPAIN)

ARS ELECTRONICA
Art, Technology & Society

sónar +D

OFFF

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ENVIRONMENTAL & BIO-DESIGN COMMUNITIES:

- **PNAT PROJECT NATURE BY STEFANO MANCUSO**

PNAT PROJECT NATURE

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WHO

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- **USERS / BENEFICIARIES**
- **PEOPLE SEEKING IMMERSIVE, MULTISENSORY EXPERIENCES.**
- **INDIVIDUALS INTERESTED IN NATURE, WELLNESS, AND CONTEMPLATIVE ENVIRONMENTS.**
- **STUDENTS, RESEARCHERS, AND DESIGNERS EXPLORING BIODATA, SOFT ROBOTICS, AND PLANT-BASED INTERACTION.**
- **BROADER AUDIENCES CURIOUS ABOUT NEW FORMS OF COMMUNICATION BETWEEN HUMANS AND THE NATURAL WORLD.**

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WHY

CONTEXT, SUSTAINABILITY, INNOVATION

The project addresses our growing disconnection from nature by revealing the real-time signals of plants and making their rhythms perceptible. It promotes sustainability by fostering awareness, empathy, and ecological responsibility through low-impact, biomimetic technologies. Its innovation lies in combining plant biodata, soft robotics, and human biofeedback to create a new model of communication that is multisensory, slow, and non-verbal.

- **RECONNECT HUMANS WITH LIVING SYSTEMS**
- **REVEAL INVISIBLE PLANT RHYTHMS**
- **EXPLORE SLOW, ECOLOGICAL INTERACTION**

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HOW

TOOLS, TECHNIQUES, PLAN A/B/C

Tools+Technologies

- Sensing: soil moisture sensors, basic environmental sensors, heartbeat sensor optional EEG.
- Microcontrollers: ESP32 or Arduino for data collection, OSC for communication.
- Soft Robotics: silicone molds, pneumatic chambers, air pumps, valves, laser-cut or 3D-printed structures.
- Sound & Interaction: TouchDesigner, Ableton/PureData.
- Fabrication: silicone casting, 3D printing, laser cutting, modular assembly for flowers and structures

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HOW

TOOLS, TECHNIQUES, PLAN A/B/C

Approach

- Collect plant biodata (soil moisture, environmental conditions).
- Translate biodata into movement using pneumatic soft robotics (flowers opening/closing).
- Integrate human biofeedback (heartbeat → micro-modulations in sound, movement, atmosphere).
- Combine signals to create a shared responsive ecosystem between plants, humans, and the installation.
- Develop a multisensory environment with soft movement, subtle sound, slow rhythms, and atmospheric design.
- Iterate through prototypes: materials, pneumatics, sensing pipelines, and sound responses.

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PSS VALUE

FUNCTIONAL VALUE

- TRANSLATES REAL PLANT BIODATA INTO VISIBLE, TACTILE, AND AUDIBLE SIGNALS.
- ALLOWS USERS TO UNDERSTAND PLANT WELL-BEING IN AN INTUITIVE WAY.
- DEMONSTRATES SOFT ROBOTICS AS A SENSITIVE, LOW-ENERGY COMMUNICATION TOOL.

EMOTIONAL & EXPERIENTIAL VALUE

- CREATES A CALMING, CONTEMPLATIVE ENVIRONMENT THAT SLOWS DOWN PERCEPTION.
- BUILDS A SENSE OF CONNECTION, EMPATHY, AND CURIOSITY TOWARD PLANT LIFE.
- OFFERS A NOVEL EXPERIENCE WHERE BIOLOGICAL RHYTHMS ARE SHARED AND SENSED.

ECOLOGICAL VALUE

- RAISES AWARENESS OF PLANT INTELLIGENCE, INTERSPECIES COMMUNICATION, AND ECOLOGICAL INTERDEPENDENCE.
- ENCOURAGES SUSTAINABLE THINKING BY MAKING NATURAL RHYTHMS VISIBLE AND VALUED.

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PSS SERVICE INTERFACE

PHYSICAL INTERFACES

THE PNEUMATIC FLOWERS THAT BLOOM AND CLOSE IN RESPONSE TO BIODATA.
THE PLANT ITSELF, AS A LIVING INTERFACE GENERATING SIGNALS.
HEARTBEAT SENSOR, PROXIMITY, BREATHING PRESENCE.

SPATIAL INTERFACES

THE IMMERSIVE GARDEN ENVIRONMENT: SOUNDSCAPE, SOFT LIGHTING, SPATIAL ARRANGEMENT.
THE AREA WHERE USERS STAND OR APPROACH THE PLANT TO “ENTER” THE SYSTEM.

DIGITAL INTERFACES

THE BIODATA PIPELINE (ESP32/ARDUINO → TOUCHDESIGNER → PNEUMATICS/SOUND).
REAL-TIME MAPPING OF PLANT SIGNALS AND HUMAN BIOFEEDBACK.

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PSS CUSTOMER USER JOURNEY

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PSS SERVICE FRONT-END & BACK-END

FRONT-END (WHAT THE USER SEES/FEELS):

REAL PLANT AND BLOOMING SOFT-ROBOTIC FLOWERS
MULTISENSORY ATMOSPHERE (MOVEMENT, SOUND, PRESENCE)
VISUAL/TACTILE EXPRESSION OF PLANT HEALTH
OPTIONAL HEARTBEAT INTERACTION
A CALM, IMMERSIVE GARDEN-LIKE ENVIRONMENT

BACK-END (WHAT ENABLES THE SYSTEM):

SOIL MOISTURE SENSORS, ENVIRONMENTAL SENSING
ESP32/ARDUINO MICROCONTROLLERS
PNEUMATIC SYSTEM: PUMPS, VALVES, SILICONE CHAMBERS
SOUND ENGINE (TOUCHDESIGNER / ABLETON / EMBEDDED AUDIO)
DATA PIPELINE MERGING PLANT BIODATA AND HUMAN BIOFEEDBACK
MODULAR, MAINTAINABLE STRUCTURE FOR SOFT ROBOTICS

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PSS PLAN A, B, C

A – FULL SYSTEM (PLANT BIODATA + PNEUMATICS + HEARTBEAT + SOUND)

- Real plant + soil moisture biodata
- Pneumatic soft-robotic flowers
- Heartbeat sensor + sound modulation
- Combined human–plant dialog (movement + sound)
- Multisensory installation ready for exhibition

PLAN B – REDUCED INTERACTION (BIODATA + PNEUMATICS + SIMPLE HEARTBEAT LAYER)

- Plant biodata controls pneumatics
- Human heartbeat included only in sound or light modulation
- Simpler hardware pipeline, same conceptual outcome

PLAN C – MINIMAL SYSTEM (BIODATA → PNEUMATICS ONLY)

- Plant biodata → pneumatic movement
- No biofeedback; humans interact passively
- Focus on materiality, softness, and ecosystem expression

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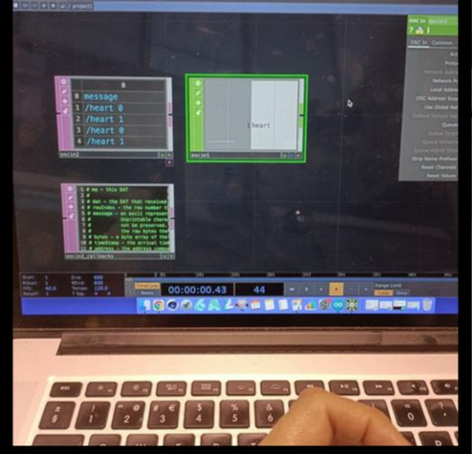
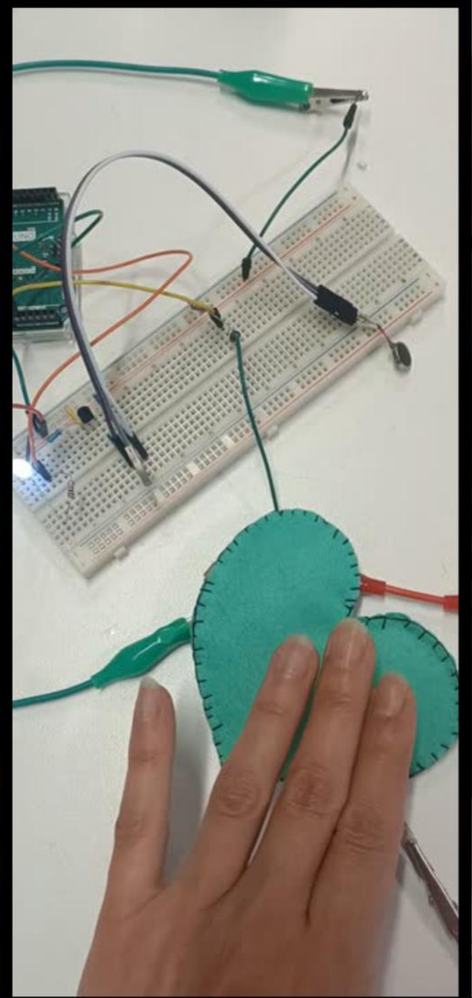
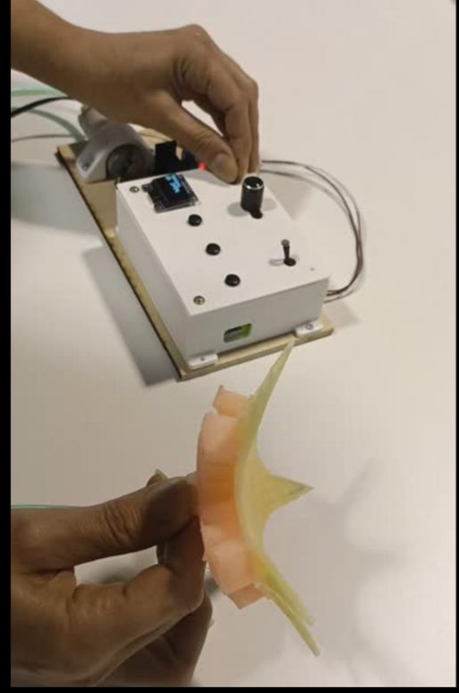
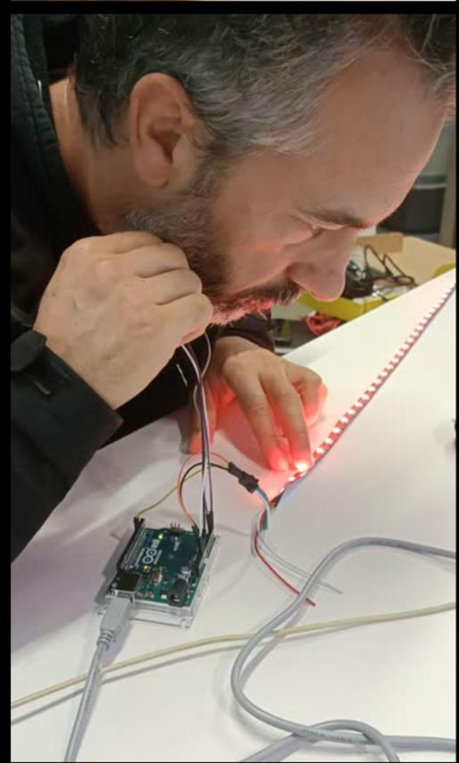
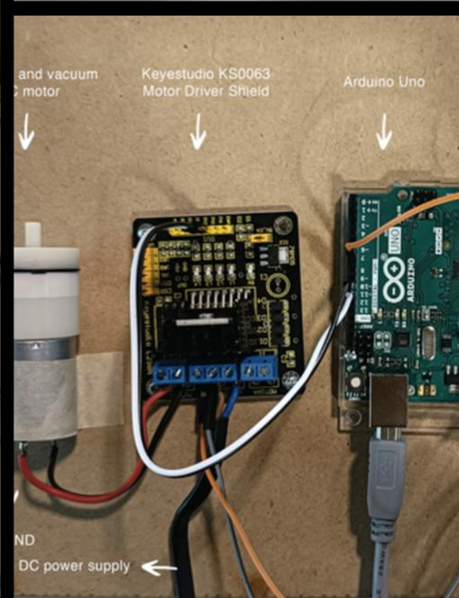
PROTOTYPES & EXPERIMENTS











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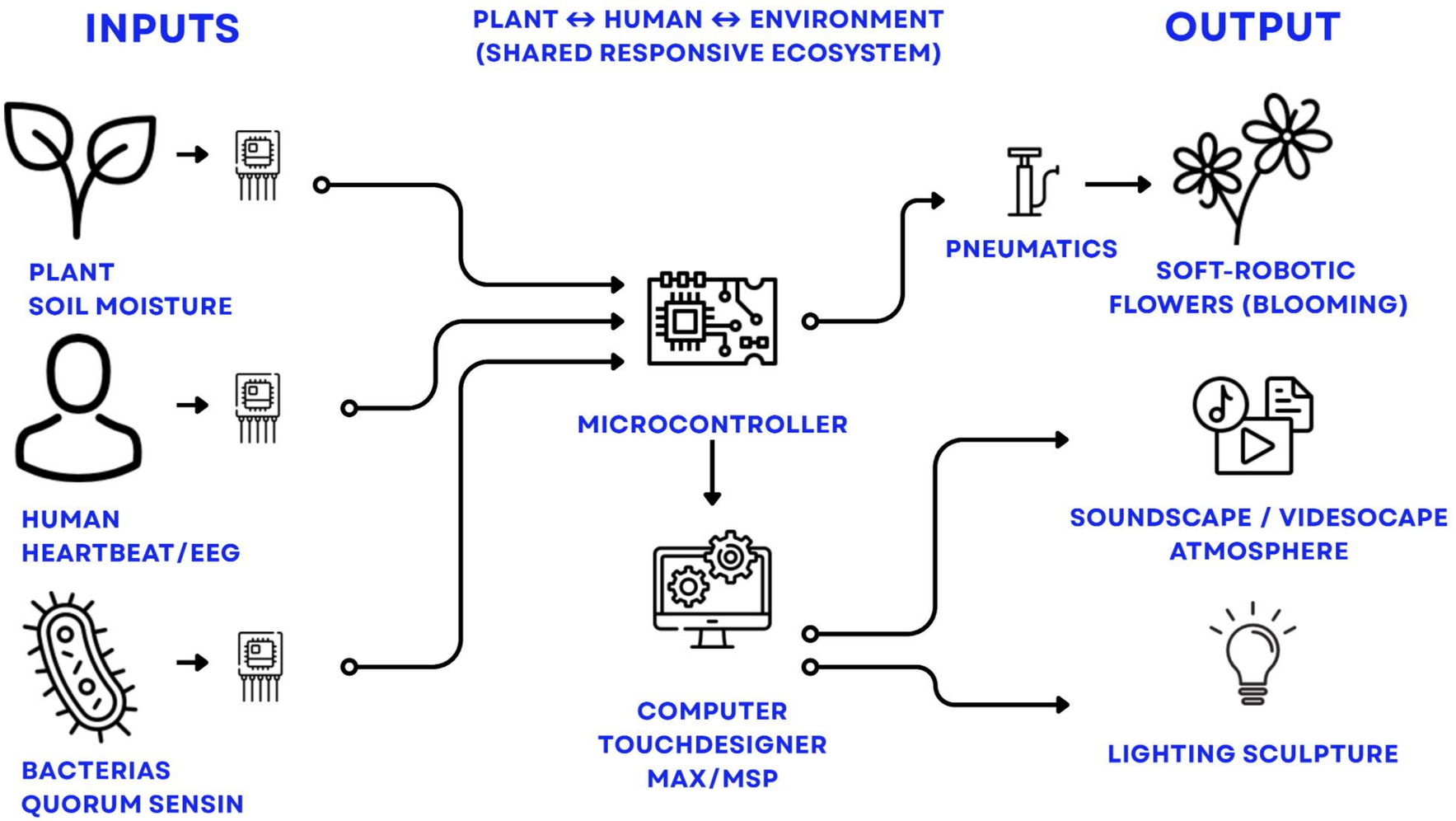
FABRICADEMY FINAL PROJECT

DIAGRAM

SYSTEM DIAGRAM – PLANT–HUMAN FEEDBACK LOOP



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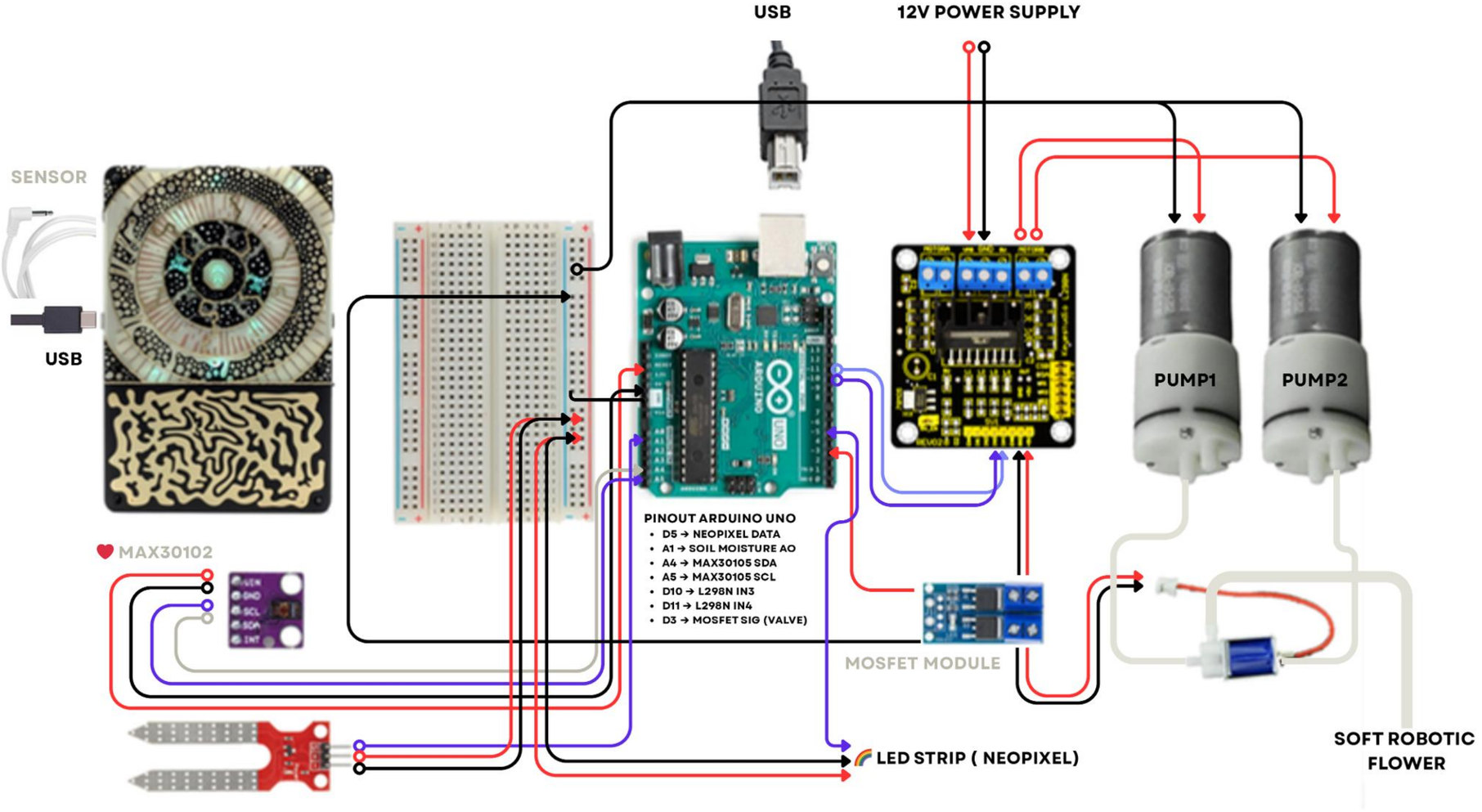
SCHEMATICS

FABRICADEMY FINAL PROJECT

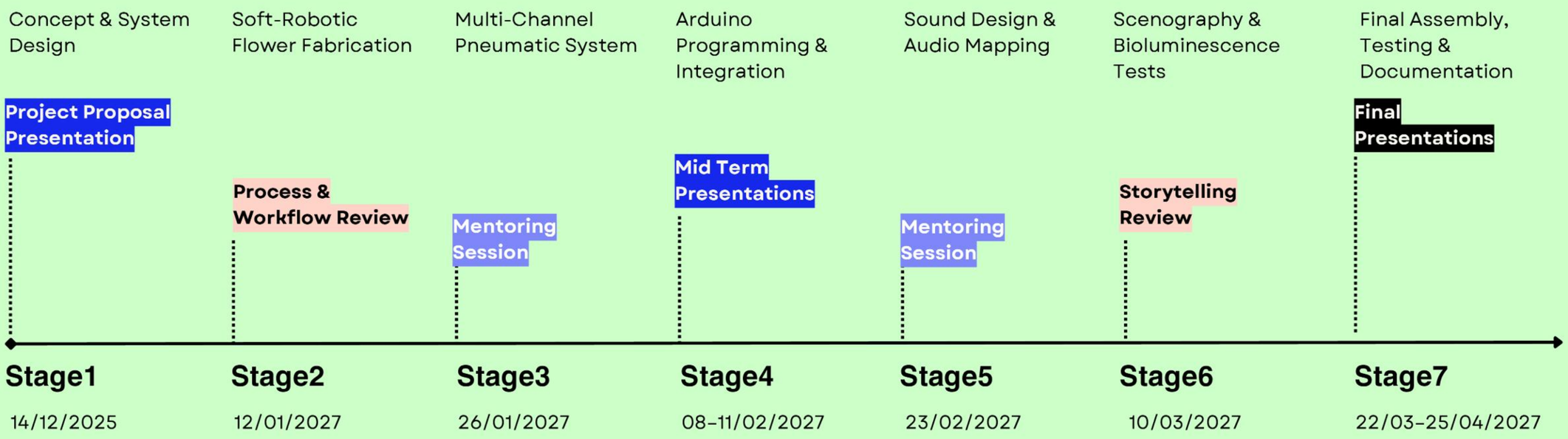


CARLOTTA PREMAZZI 2026

VHEN

FABRICADEMY PROJECT PROPOSAL PRESENTATION

Timeline



EXPECTED OUTCOMES

FABRICADEMY PROJECT PROPOSAL PRESENTATION

FULLY WORKING INTERACTIVE INSTALLATION

FULL DOCUMENTATION (WEBSITE, DIAGRAMS, PHOTOS, VIDEO)

EXHIBITION-READY VERSION TO SELL PRESENT

2025-2026

CARLOTTA PREMAZZI

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THANK YOU

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