18 Pitch di giovani ricercatori MUSA

Quarto General Meeting

Indice Presentazioni

Plant functional traits – Small Nature-based solutions for improving urban air quality and soil hydrology

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Spoke 1: Urban Regeneration (Biodiversity)
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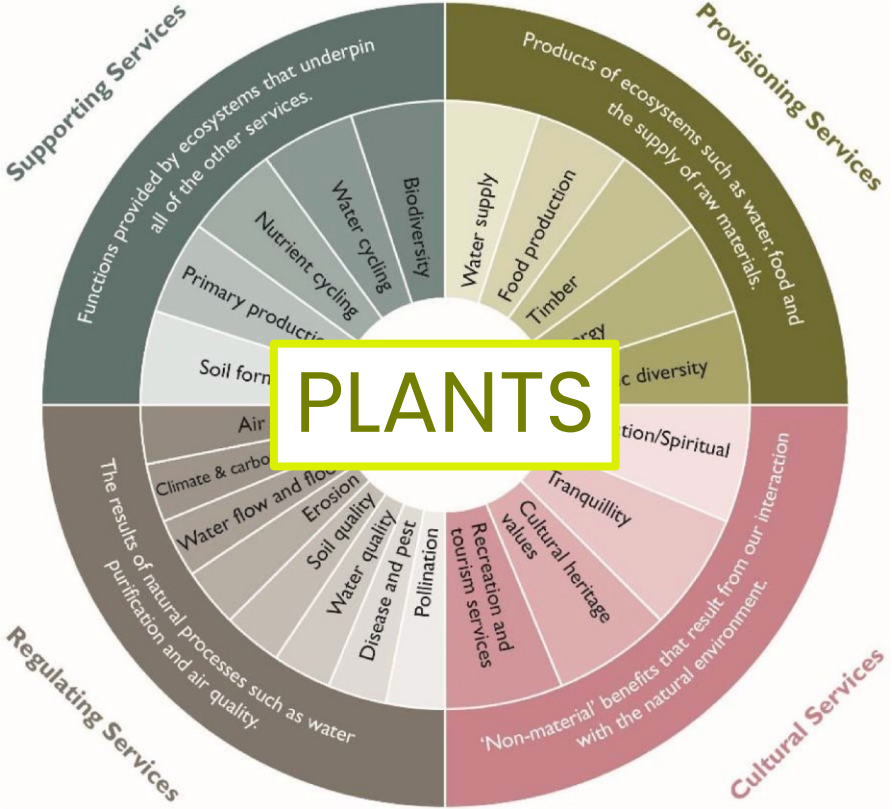
Ecosystem services: the aspects of ecosystems that directly and indirectly benefit humanity



Highly tangible, visible

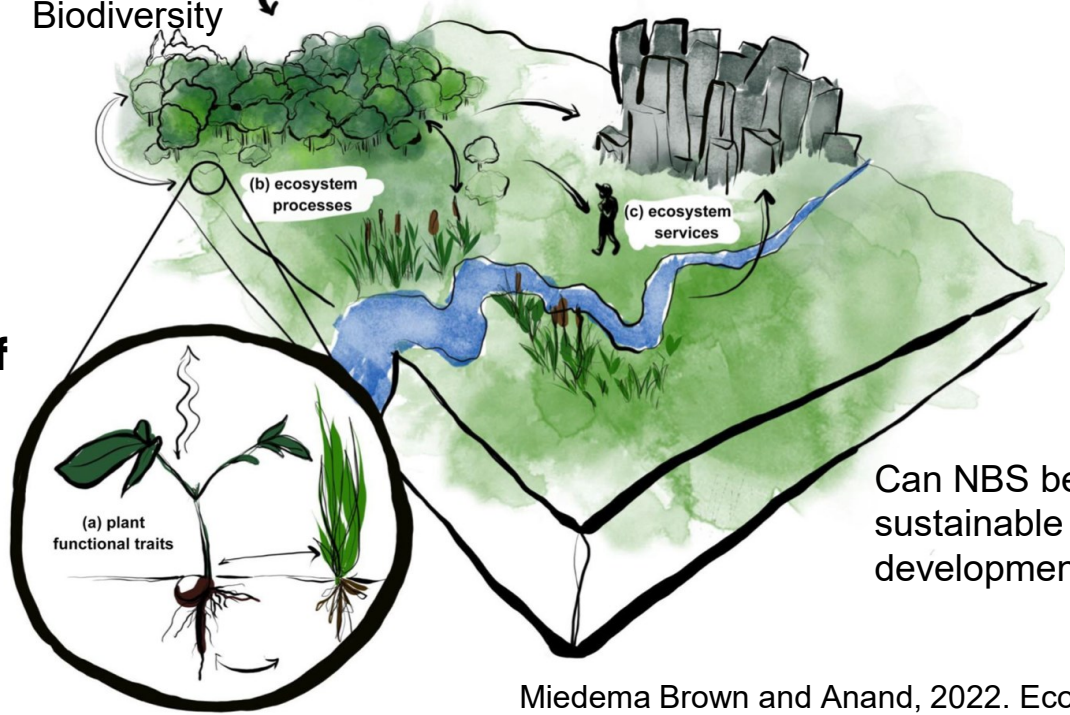
Measurable, invisible

Can plants help us to provide ecosystem services on a more local scale?

Clean air, water and soil
Ambient temperature regulation
Biodiversity

Nature-based solutions

There is growing evidence that plant functional traits are reliable indicators of ecosystem services



Can NBS be a part of an sustainable urban development plan?

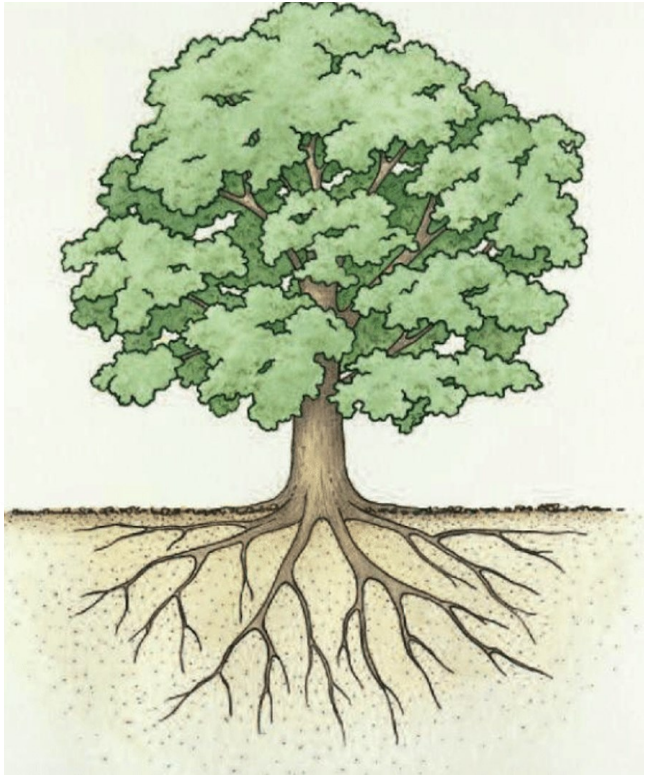
Miedema Brown and Anand, 2022. Ecosphere 13: e3930

Plant Functional Traits

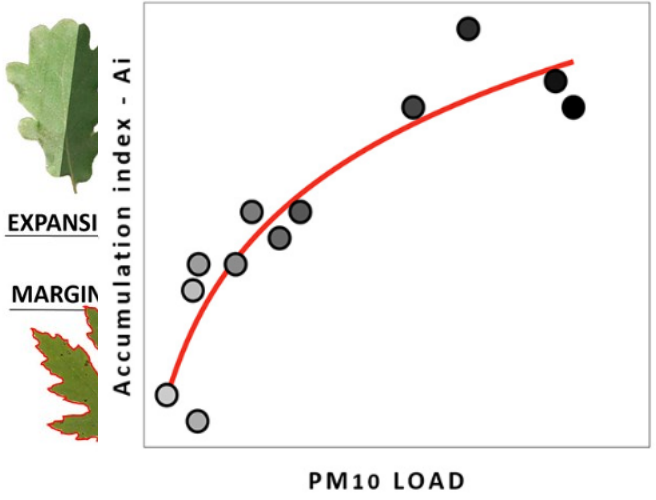
Definition: Chemical and physical traits of plants that determine their responses to and effects on environmental conditions

Leaf:
- Area
- Shape
- Thickness
- Nutrient content (N, C, P)
- Stomatal density
- Trichomes
- Carbon assimilation rate

Root:
- Mass
- Depth
- Length
- Architecture



Observed: Leaf shape and leaf surface features can affect particulate accumulation



Trai

	Micromorphology									
	Roughness			Stomata	Trich					
SCORE	Type	Area (%)	Grooves (µm)	Density (#/mm²)	Cover					
0	S	<1	>2	<100						
1	P/V	1–33	1.5–2	100–250						
2	G/V	33–66	1–1.5	250–350						
3	G	>66	<1	>350						

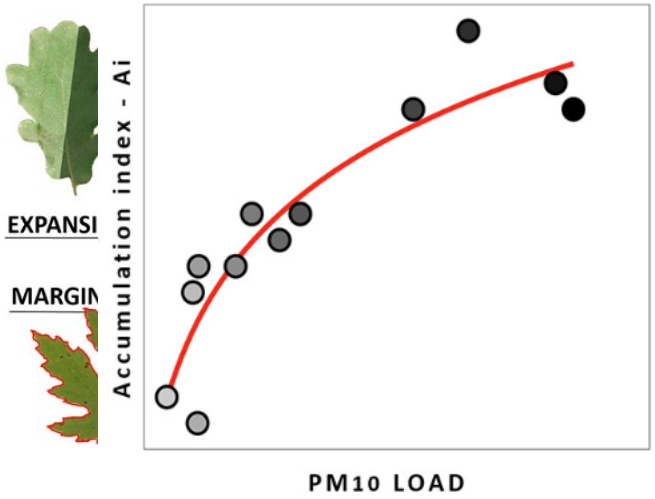
	MICROMORPHOLOGY					MACROMORPHOLOGY				
	Roughness			Stomata	Trichomes	Morphology		Foliage	LGE	
Species	Type	Area	Grooves	Density	Covered area	Margin	Shape			Total Ai
A. s.	3	2	3	3	1	0	2	0	3	17
C. b.	2	2	2	1	1	0	0	0	0	8
C. a.	0	0	0	0	0	0	2	3	3	8
C. au.	3	1	1	2	0	1	0	0	2	10
M. g.	0	0	0	2	3	0	0	3	3	11
P. a.	3	3	2	2	0	0	2	0	2	14
P. n.	0	0	0	0	0	1	0	0	2	3
P. t.	3	3	3	1	3	1	0	0	1	15
P. c.	3	3	3	3	0	1	0	0	3	16
Q. p.	3	1	1	2	1	1	0	0	2	11
R. p.	1	2	2	0	1	0	1	0	2	9
T. c.	0	0	0	1	1	1	0	0	1	4

ge

>66 / / >70% (60 days) EVE

Sgrigna et al., 2020 Science of the Total Environment 78: 137310

Observed: Leaf shape and leaf surface features can affect particulate accumulation



Trai

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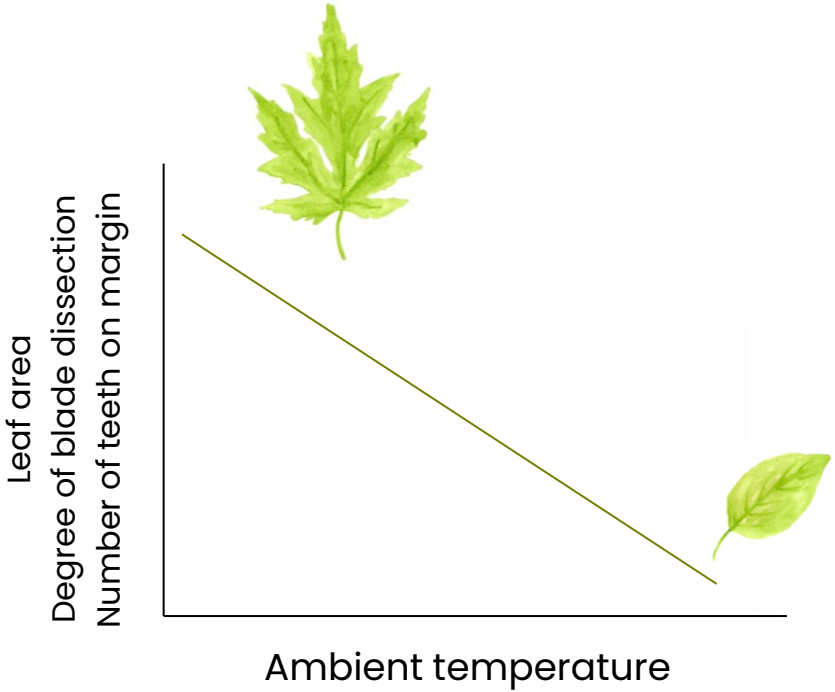
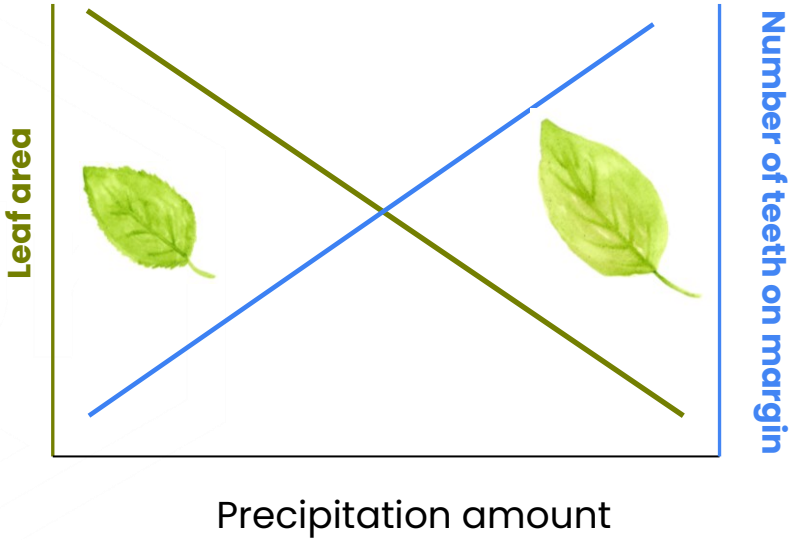
Q. p.	3	1	1	2	1	1	0	0	2	11
R. p.	1	2	2	0	1	0	1	0	2	9
T. c.	0	0	0	1	1	1	0	0	1	4

Correlations found between clusters of leaf traits and degree of PM deposition

Sgrigna et al., 2020 Science of the Total Environment 78: 137310

Observed: Adaptive leaf morphologies in response to environmental conditions





Royer et al., 2012 Am. J Botany 99: 915-922

Peppe et al., 2011 New Phytologist 190:724-739

Piazza della Scienza:

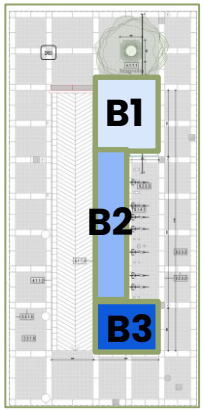
A 'living laboratory' to study the factors regulating an NBS

SOIL MOISTURE AND WATER-USE

B1: Shrub cover

B2: Herbaceous cover

B3: Combined shrub and herbaceous cover



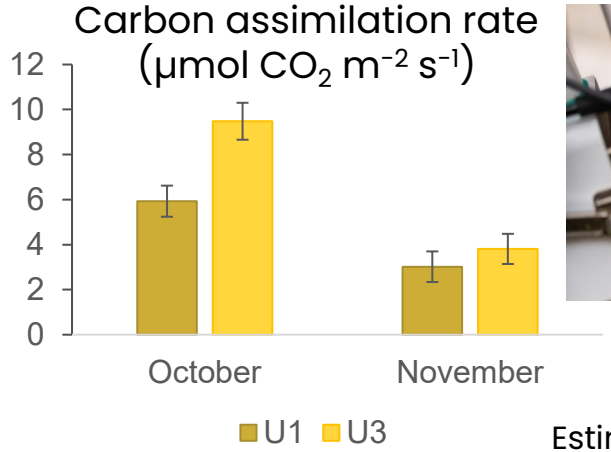
AIR QUALITY

Evergreen and deciduous together

Evergreen only

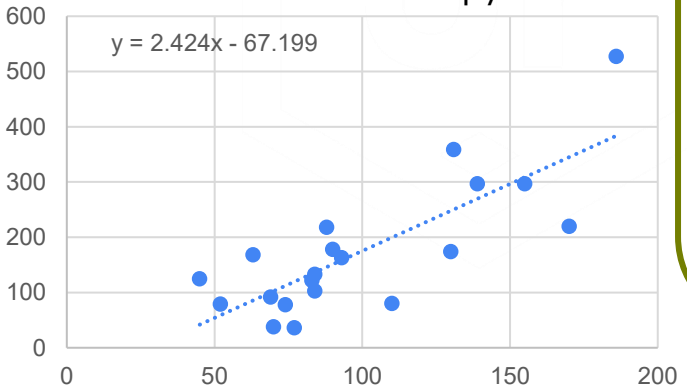
Deciduous only

Physiological data



One tree had 7760 leaves

= 12.3 m^2 of leaf area



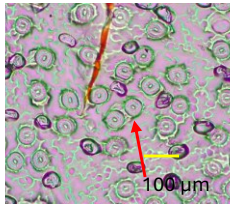
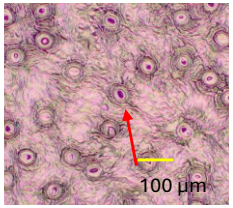
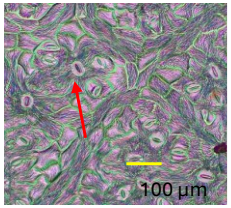
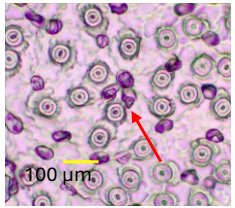
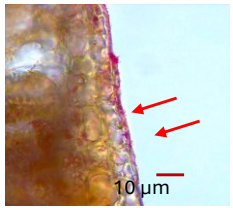
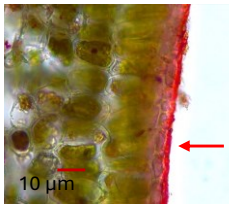
October carbon sequestration:

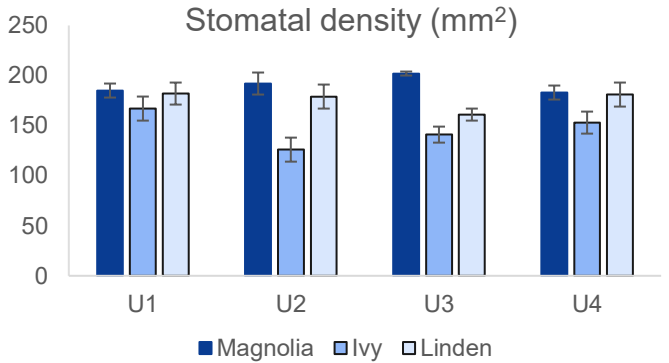
U1: 146 µmol CO_2 s^{-1}
U3: 233 µmol CO_2 s^{-1}

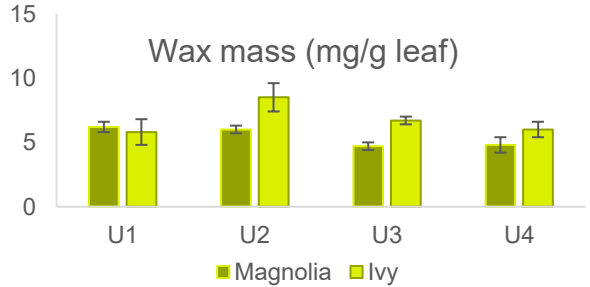
November carbon sequestration:

U1: 74 µmol CO_2 s^{-1}
U3: 94 µmol CO_2 s^{-1}

Leaf morphological traits (in collaboration with the group of Prof. Sandra Citterio)

	Magnolia	Ivy	Linden
a. Stomata			
b. Trichomes			
c. Epidermal wax			





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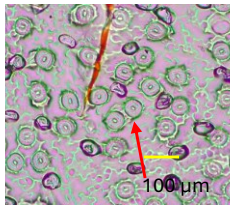
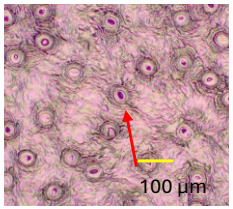
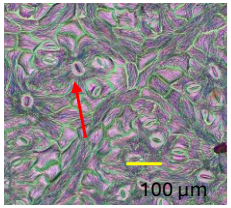
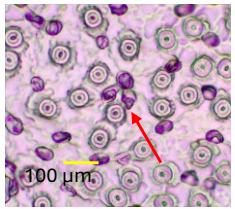
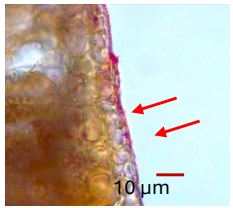
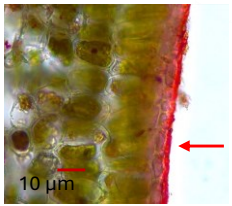
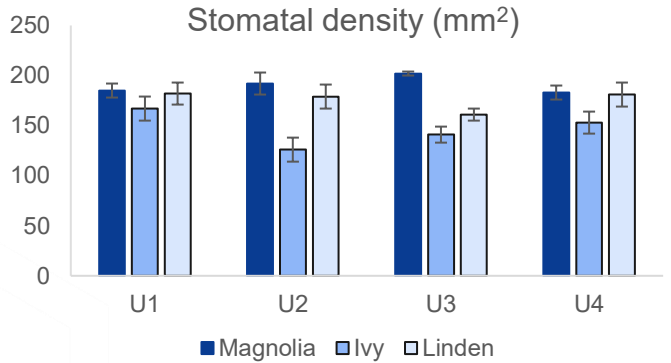
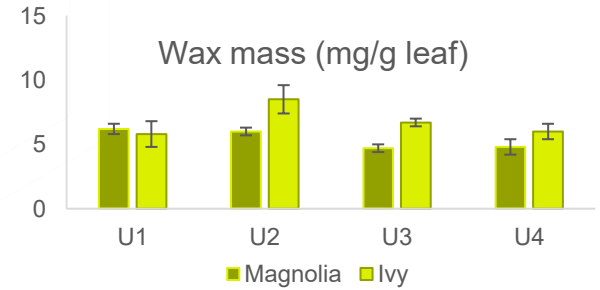
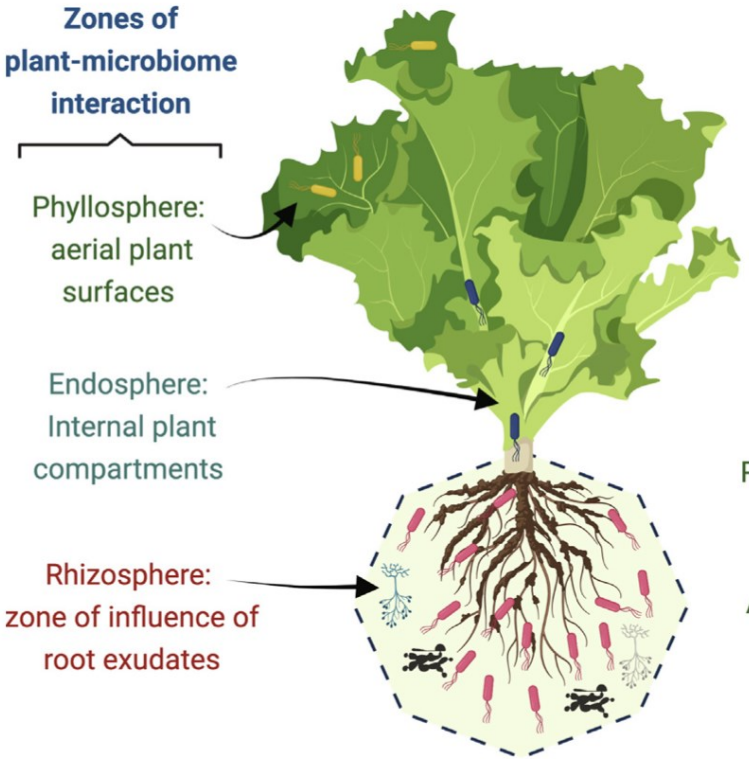
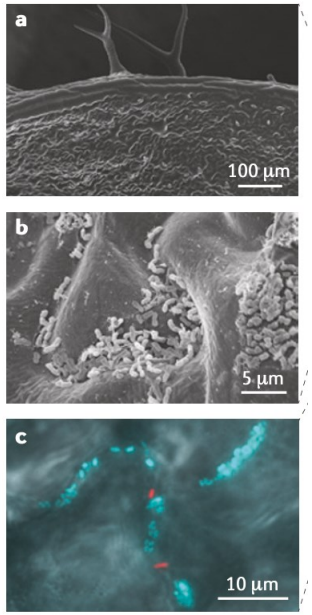
a. Stomata			
b. Trichomes			
c. Epidermal wax			







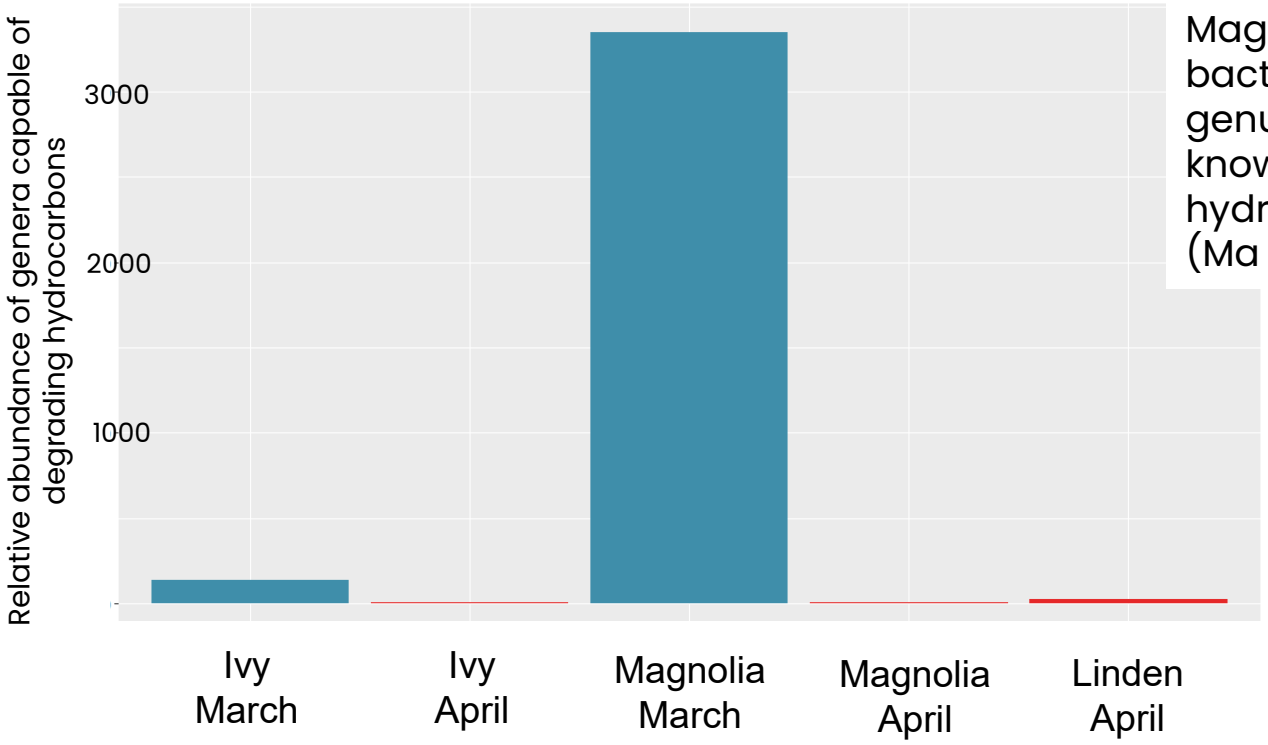
Microtopographic features of leaves (es. stomata, trichomes) affect bacterial communities composition (Yan et al.)



Microbial services

- Biological control of pathogens
- Plant growth promotion
- Plant fitness
- Amelioration of abiotic stress

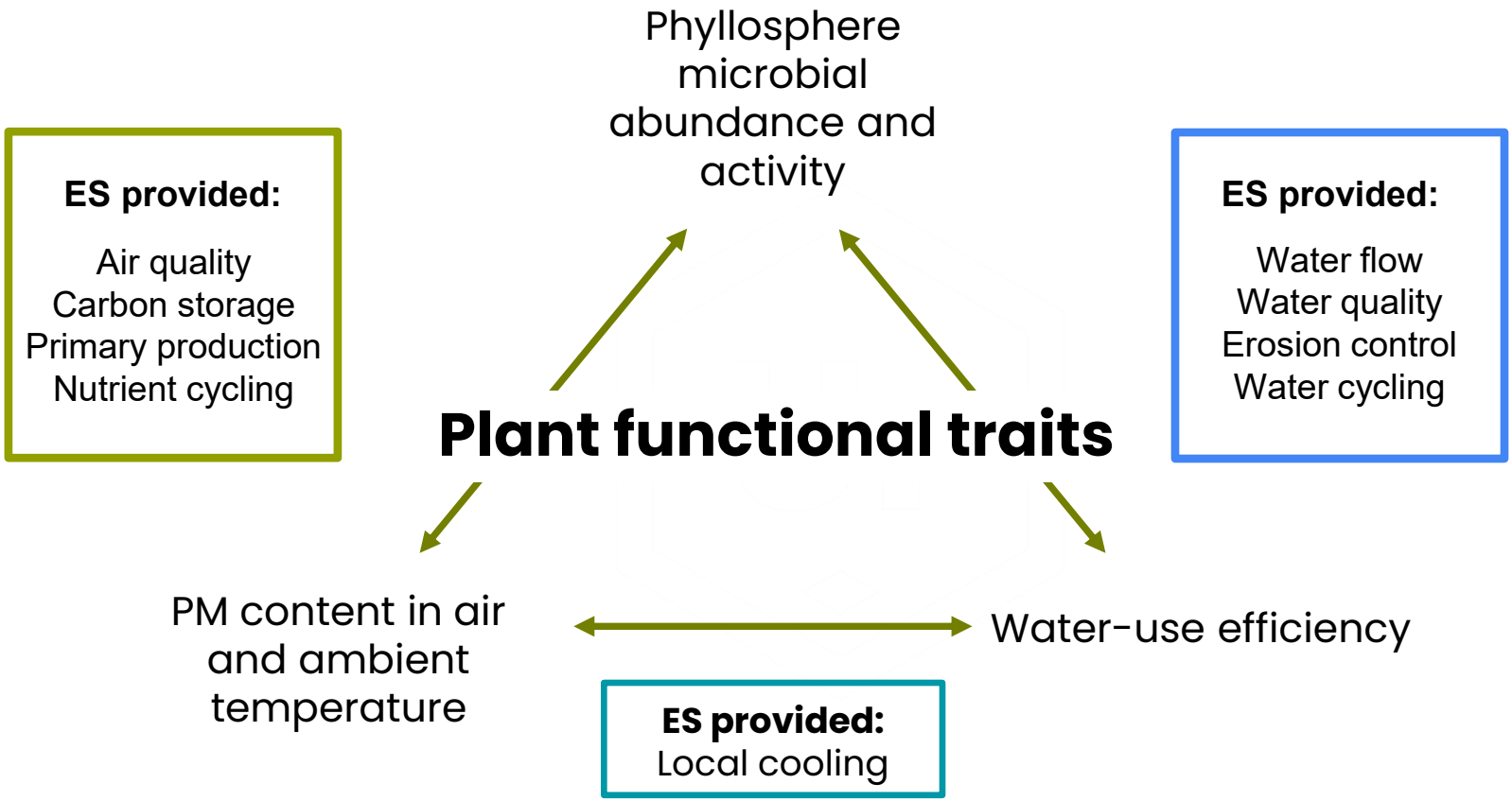
In collaboration with the group of Prof. Andrea Franzetti, we are investigating whether microbiome profiles are correlated with leaf functional traits and air quality



Magnolia trees host more bacteria belonging to the genus *Rhodococcus,* a genus known for its abilities in hydrocarbon degradation (Ma et al.).

Rhodococcus

Other genera


Phyllosphere microbial abundance and activity
ES provided:
Air quality
Carbon storage
Primary production
Nutrient cycling
ES provided:
Water flow
Water quality
Erosion control
Water cycling
Plant functional traits
PM content in air and ambient temperature
Water-use efficiency
ES provided:
Local cooling

Acknowledgements

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Plant Physiology Students: Margherita Emma Gorla, Gaia Gravante, Nicolo Travagnin

Research Collaborators (UNIMIB)

Lab group of Prof. Andrea Franzetti: Isabella Gandolfi, Francesca Pittino, Cristiana Rizzi

Lab group of Prof. Sandra Citterio: Sarah Caronni, Emanuele Vegini, Davide Calvi

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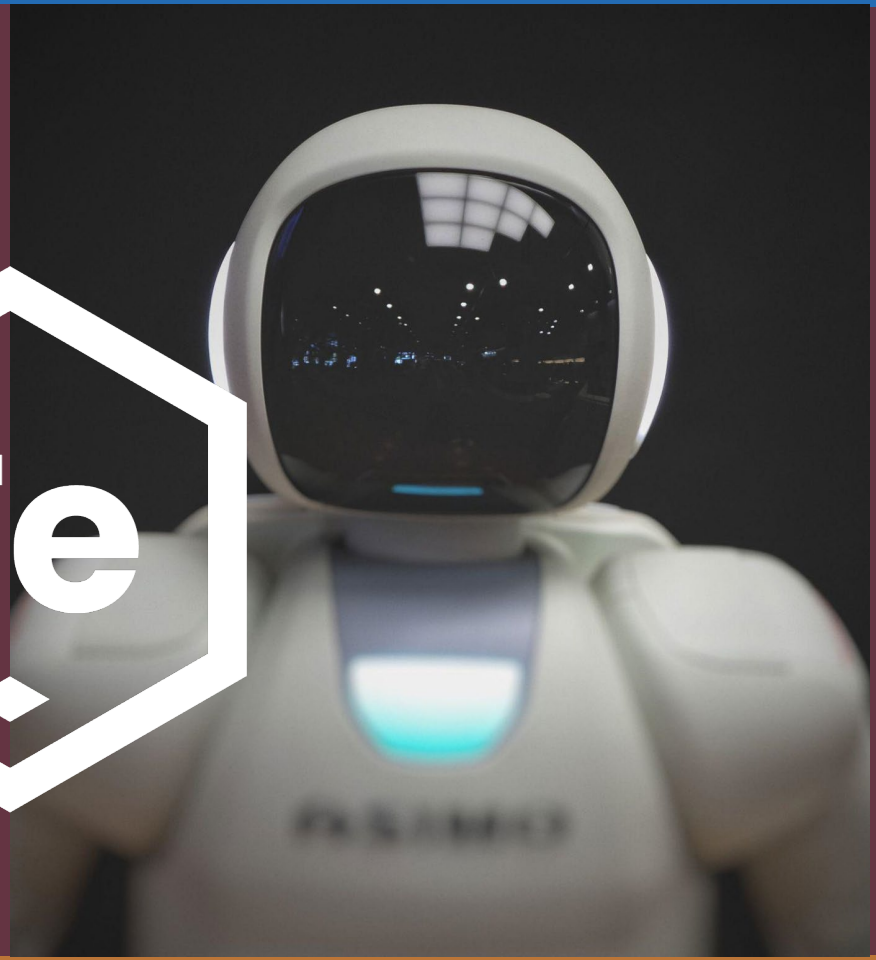
Ministero dell'Università e della Ricerca
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA
MUSA

MUSA Tech

Implementation of an electronic nose for real -time identification of odour emission peaks at a wastewater treatment plant

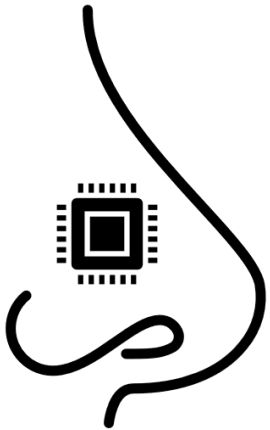


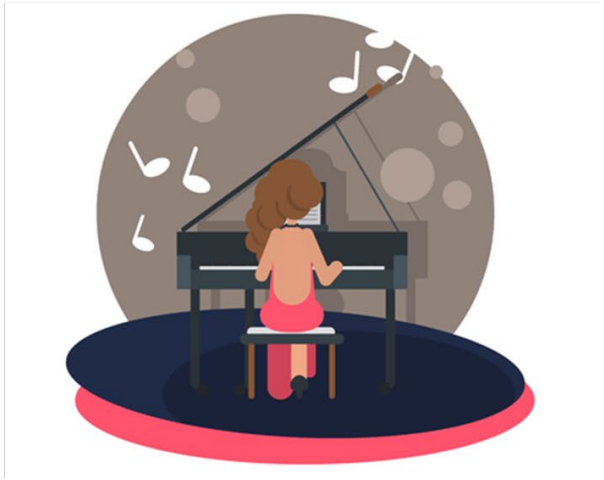
Carmen Bax

E-Nose

"An instrument which comprises an array of electronic chemical sensors with partial specificity and an appropriate pattern recognition (PR) system, capable of recognizing simple or complex odours"

Gardner & Bartlett, 1994





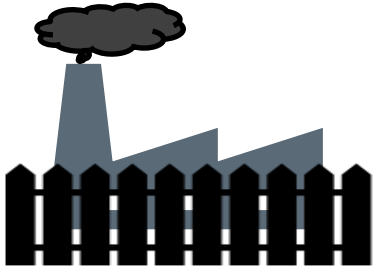
E-Noses for environmental odour monitoring

E-Noses represent the only instruments for the continuous monitoring of odour emissions capable to provide information about the odour type/class

Receptor

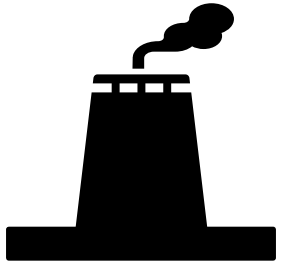
A. Detection
B. Classification

Plant fenceline



A. Detection
B. Classification
C. Quantification

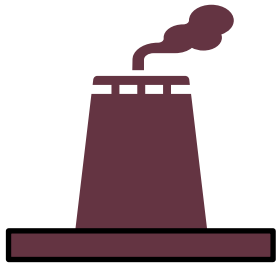
Emission source



A. (Classification)
B. Quantification

E-Noses aimed at process control

Emission source



A. (Classification)

B. Quantification

- The continuous characterization of odorous emission by E-Noses represents an emerging application scenario

- It turns useful for:
  - Continuous verifying the plant is working under **regular operating conditions**
  - The **real-time identification of malfunctioning** and/or anomalies

WWTP monitoring

- Real-time identification of "anomalous" conditions (odour peaks) at the arrival tank of a WWTP
- Automatic activation of a gas sampler in correspondence of the identified odour peaks for further investigations (chemical and olfactometric analyses)
- Analysis of the frequency of occurrence of the odour peaks and correlation with odour perceptions by citizens

Final goal is the identification of the causes of unpredictable odour peaks

WWTP monitoring

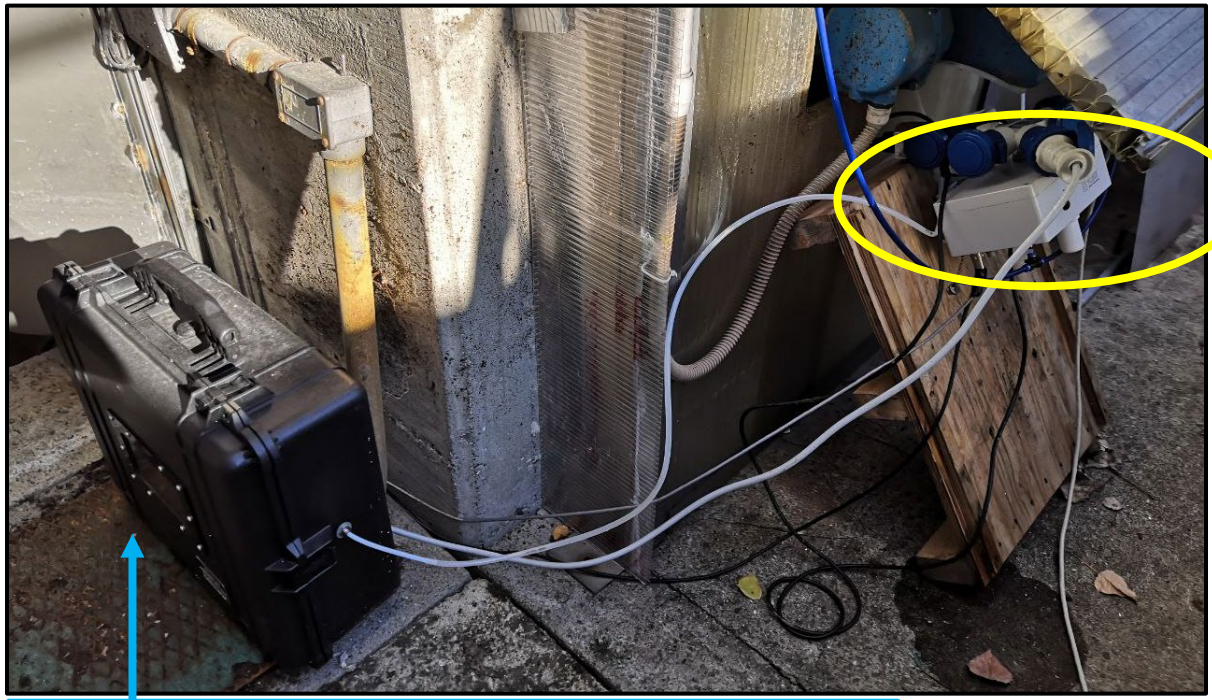
Challenges

- Extreme variability and unpredictability of the emission source
  - Odour concentration ranged from 100 to 100'000 ou_E/m^3
- Adaptation of the IOMS sampling system to the harsh emission environment

Strategies

- Development of specific IOMS training and validation approaches
- Application of dilution system and condense collection to the IOMS sampling line

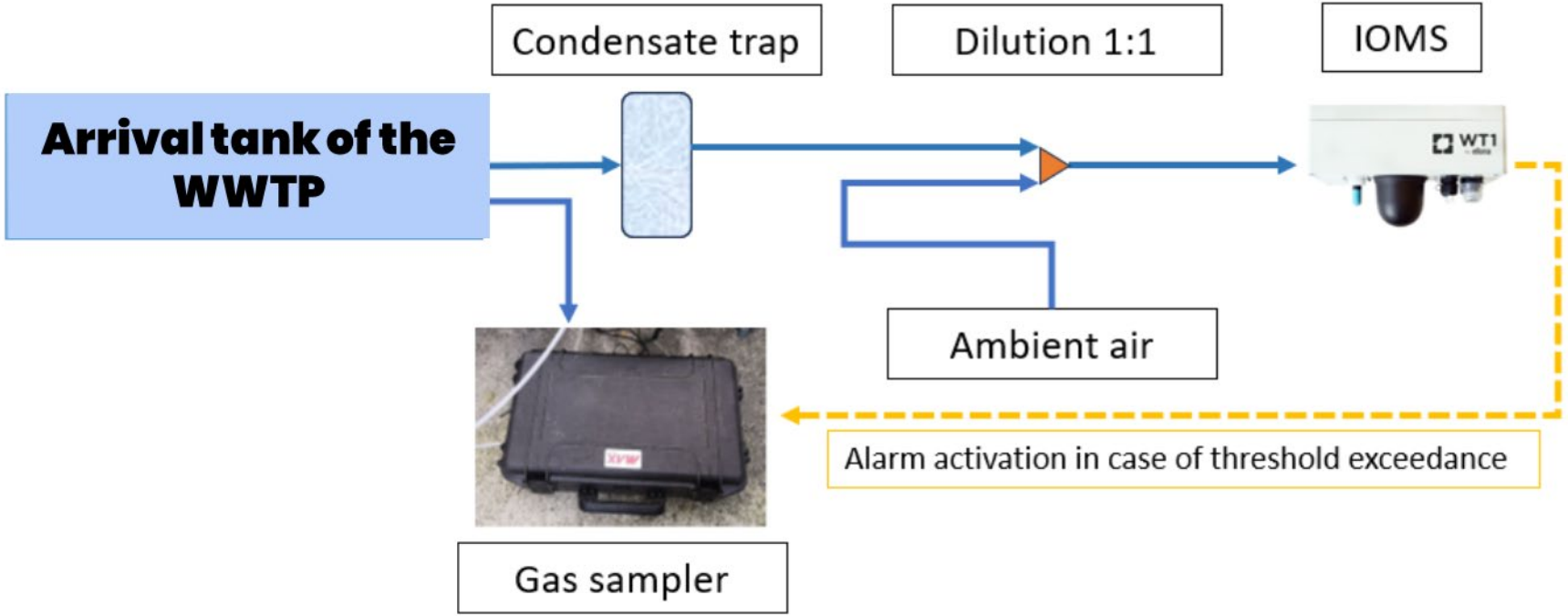
E-Nose sampling and analysis



Ellona outdoor E-Nose
- 4 MOX sensors,
- 3 electrochemical sensors (H2S, CH2O, NH3)
- 1 PID sensor (VOC)

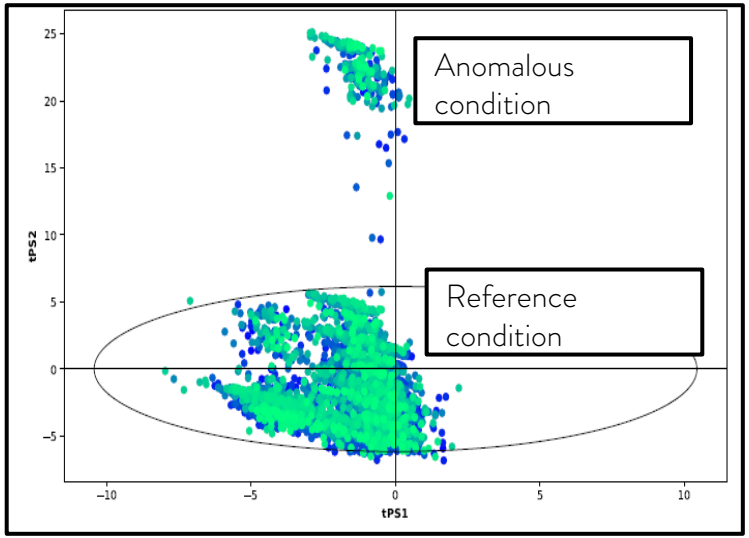
Appositely developed gas sampling system for sample withdrawal

E-Nose sampling and analysis



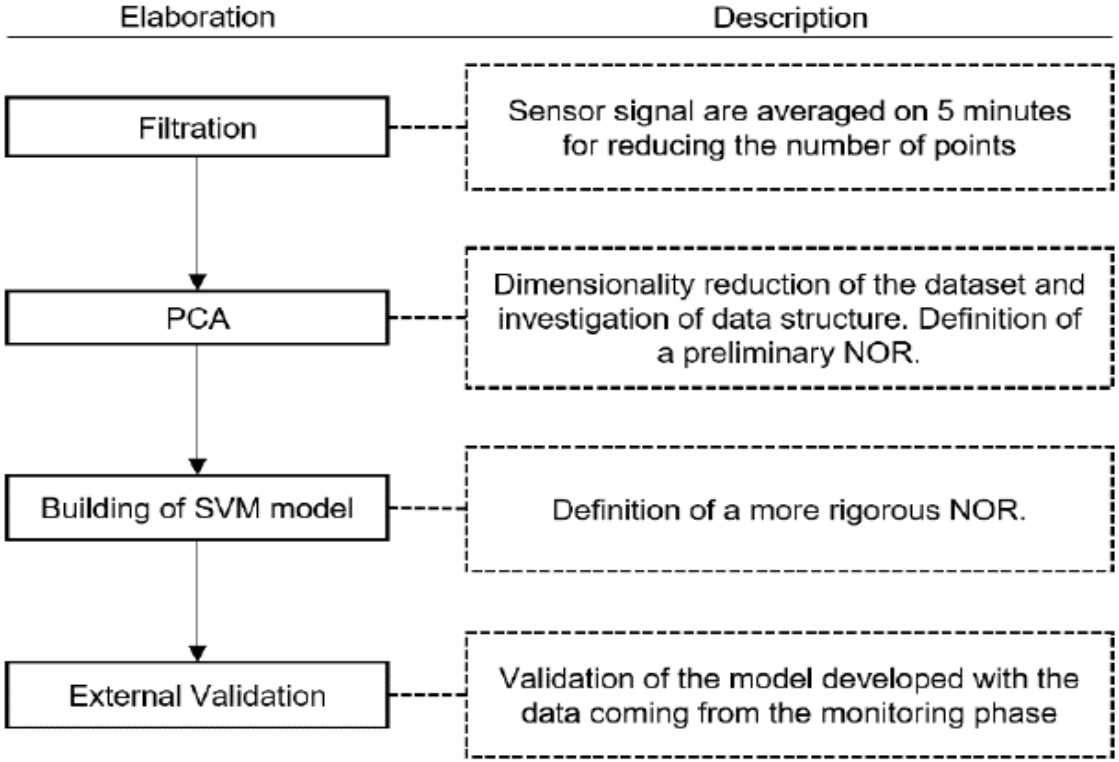
E-Nose training and validation

- E-Nose training, lasted about 30 days, was aimed at the definition of a **"reference" condition** at the arrival tank of the WWTP **representative of moderate odour concentration**, unlikely to cause nuisance to the citizens living nearby the plant.

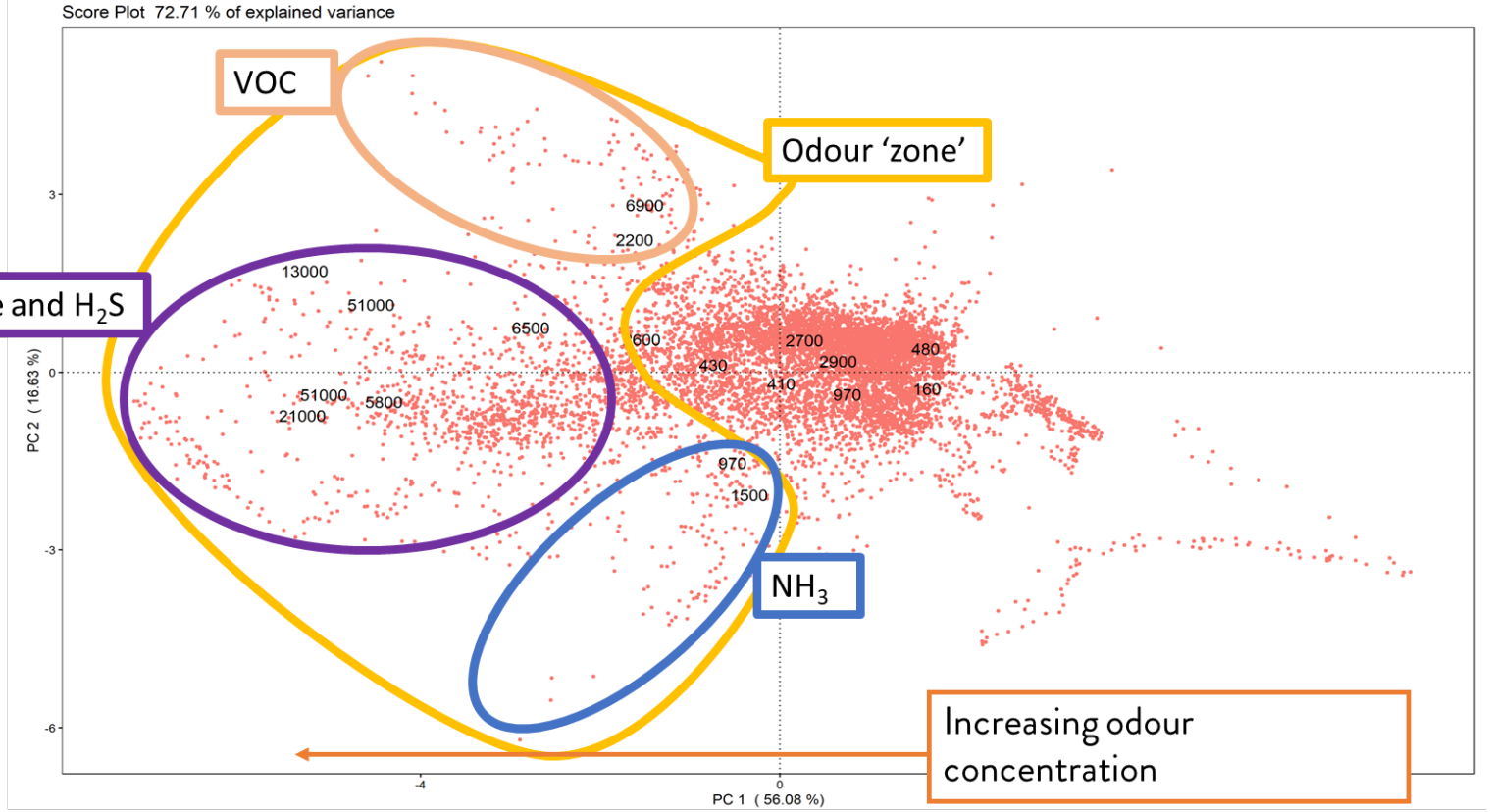


- 18 samples, collected at the arrival tank on 10 different days and characterized by olfactometry, were used for model tuning
- 10 validation samples were then collected over the monitoring period both in case of alarm threshold exceedance and under normal conditions

E-Nose training and validation



E-Nose training data



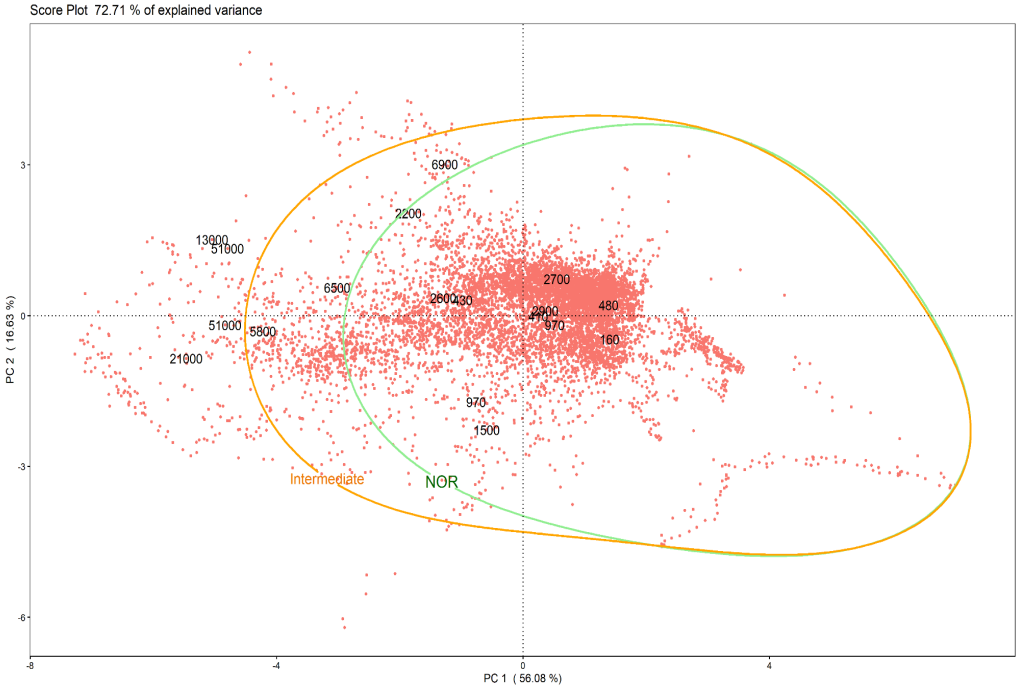
Definition of the Normal Operating Region

- Investigation of the distribution of training data relevant to odour conditions not causing nuisance outside the plant
  - Normal region:

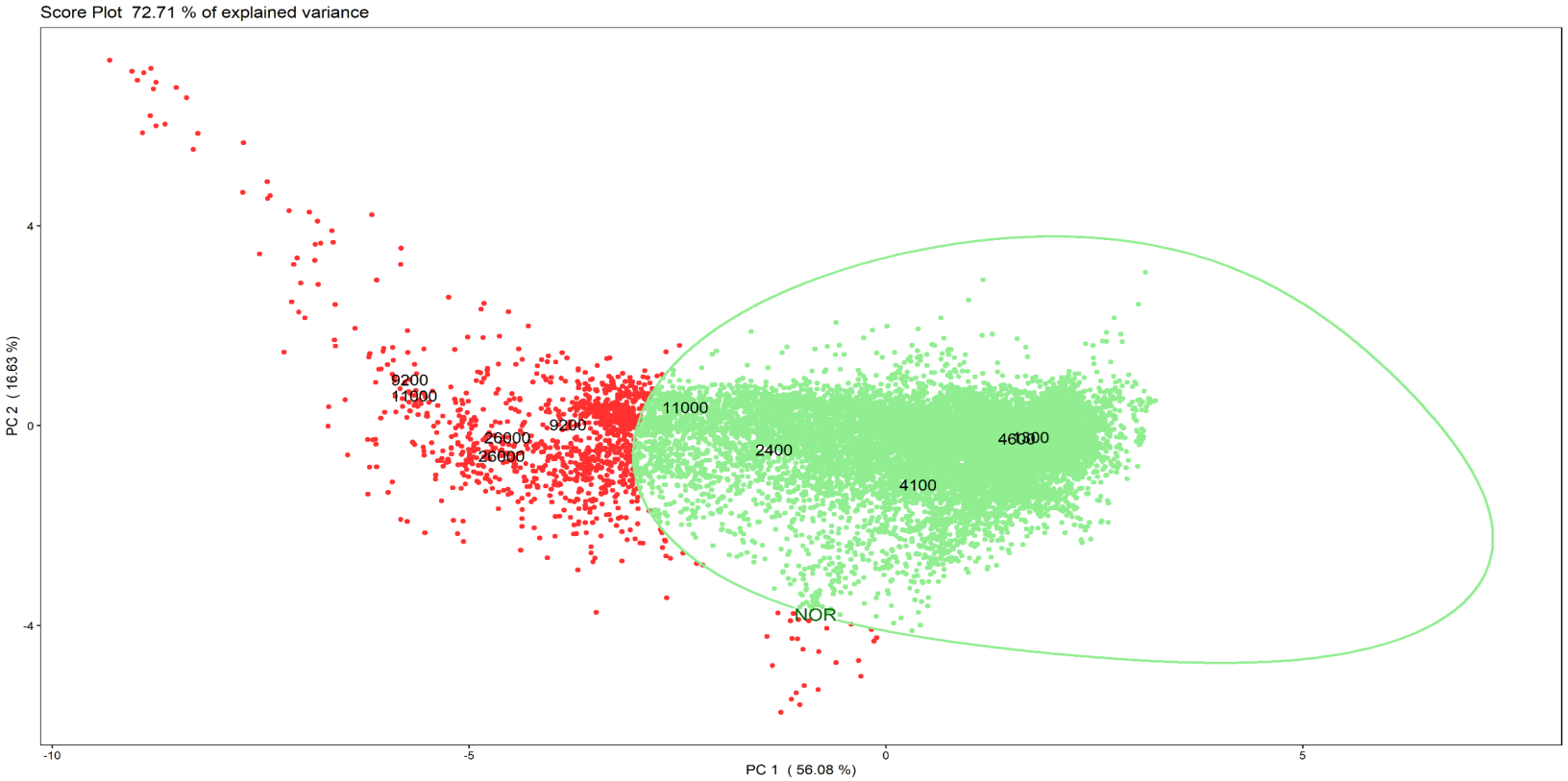
    cod < 4500 ou_E/m^3
  - Intermediate region:

    4500 ou_E/m^3 < cod < 10'000 ou_E/m^3

- Combination of E-Nose signals with citizens' reports and results of olfactometric campaigns



Model validation: Scenario 1



Model validation: Scenario 1

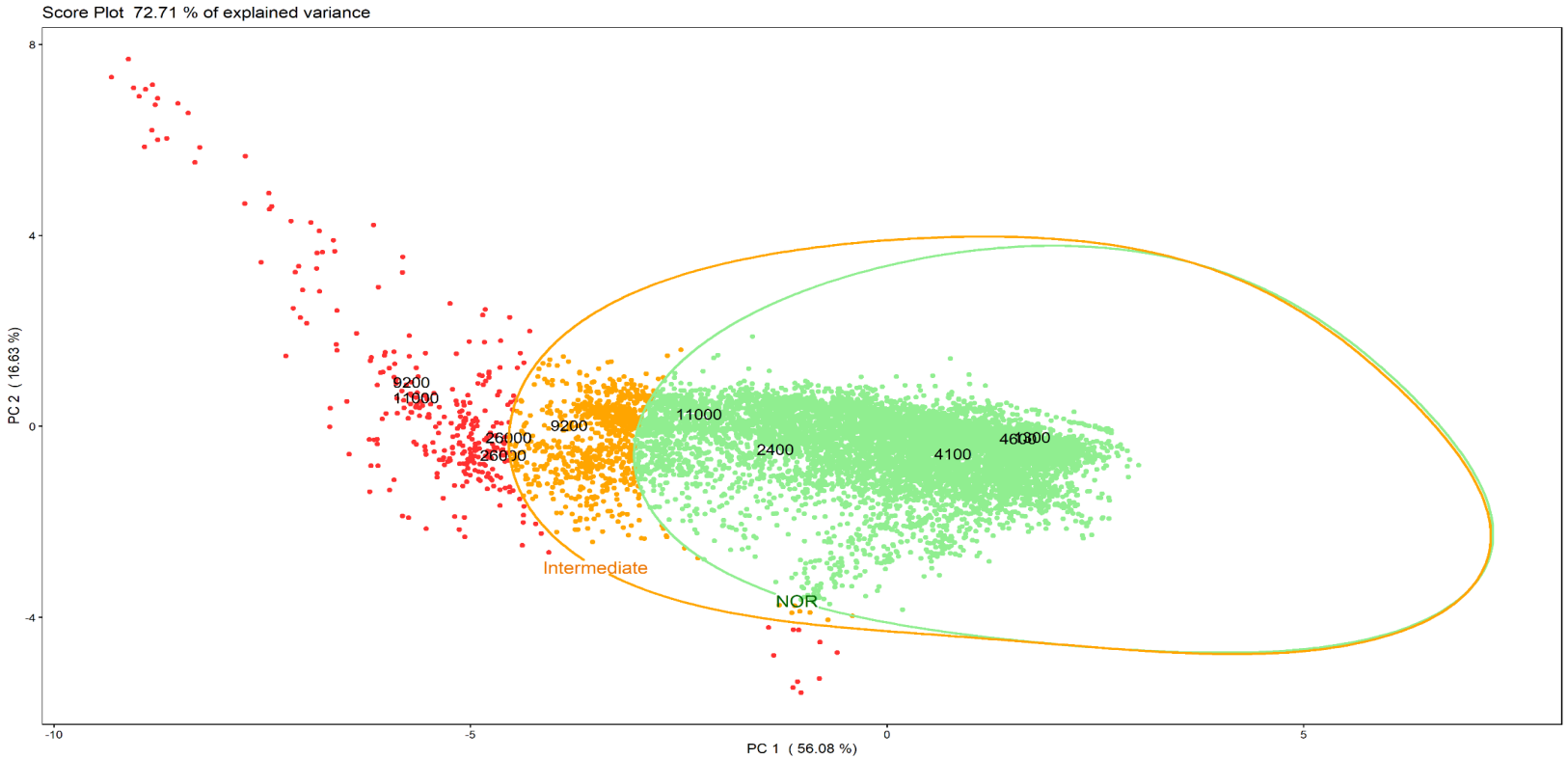
Odour concentration [ou_E/m^3]	Expected classification	SVM classification
4100	NOR	NOR
2400	NOR	NOR
1300	NOR	NOR
11000	Alarm	Alarm
4600	NOR	NOR
9200	Alarm	Alarm
11000	Alarm	NOR
9200	Alarm	Alarm
26000	Alarm	Alarm
26000	Alarm	Alarm

$Recall_{NOR}$ = 100%

$Recall_{Alarm}$ = 83%

Balanced accuracy
91.5 % ($CI_{95\%}$ 55 – 100 %)

Model validation: Scenario 2



Model validation: Scenario 2

Odour concentration [ou_E/m^3]	Expected classification	SVM classification
4100	NOR	NOR
2400	NOR	NOR
1300	NOR	NOR
11000	Alarm	Alarm
4600	NOR	NOR
9200	Intermediate	Intermediate
11000	Alarm	NOR
9200	Intermediate	Alarm
26000	Alarm	Alarm
26000	Alarm	Alarm

$Recall_{NOR}$ = 100%

$Recall_{Intermediate}$ = 50%

$Recall_{Alarm}$ = 75%

Balanced accuracy
75 % ($CI_{95\%}$ 44 – 97 %)

Conclusions and future works

E-Noses can real-time detect deviations from normal operating conditions of industrial emissions

- targeting the activation of automatic sampler for deeper characterizations and reduction of odour nuisance in the surroundings of the plant

… but their use for environmental monitoring in complex environments is not trivial!

- Design of adequate training and testing procedures is necessary to obtain stable and reproducible results

Several challenges are still opens….

- compensation of interferences, drift management, calibration transfer, standardization

Thank you for attention

carmen.bax@polimi.it

Redefining Luxury Skincare: Innovation Meets Sustainability

QUARTO GENERAL MEETING MUSA
9th December 2024

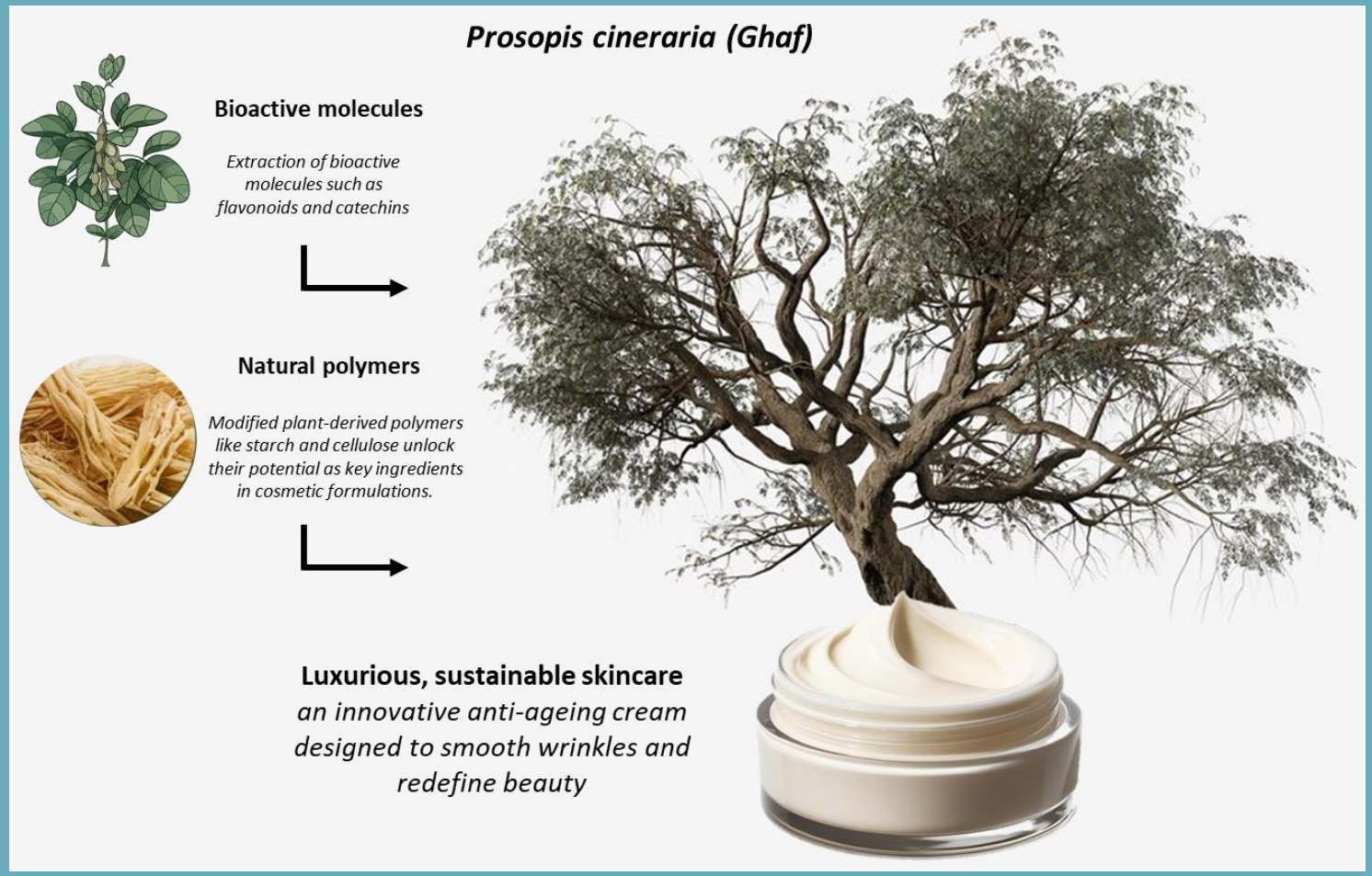
PhD student: Beatrice De Santes


Paolo Galli
Professor of Ecology
Visiting Professor University of Dubai
Director of MaRHE Center Maldives
MaRHE
Miriam Colombo
Professor in Clinical biochemistry
NANOCOSPHA

MUSA **Design**

Sustainable Fashion, Luxury and Design

Spoke 5 focuses on aligning some of the flagship sectors of Milan's highly visible industry - luxury, fashion and design - with the highest standards of sustainability through new materials, processes and development models.



Project Timeline

Natural sources

Identification of natural sources of interest

Exploring different extraction methods

Extraction

Experimental investigation

in vitro screening of potential anti-age properties and polymers modifications

Devolopment of the cosmetic formulation

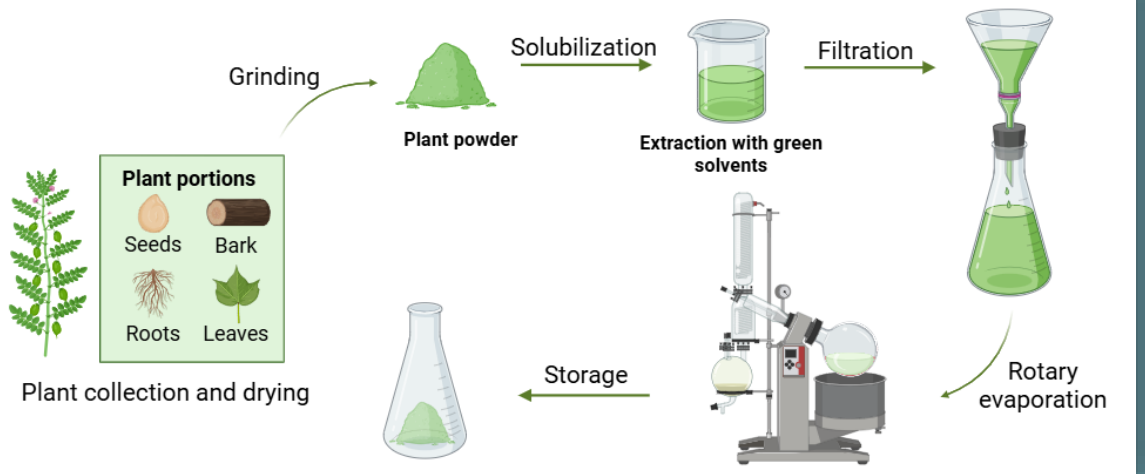
Cosmetic formulation

Natural sources → **Extraction** → **Experimental investigation** → **Cosmetic formulation**

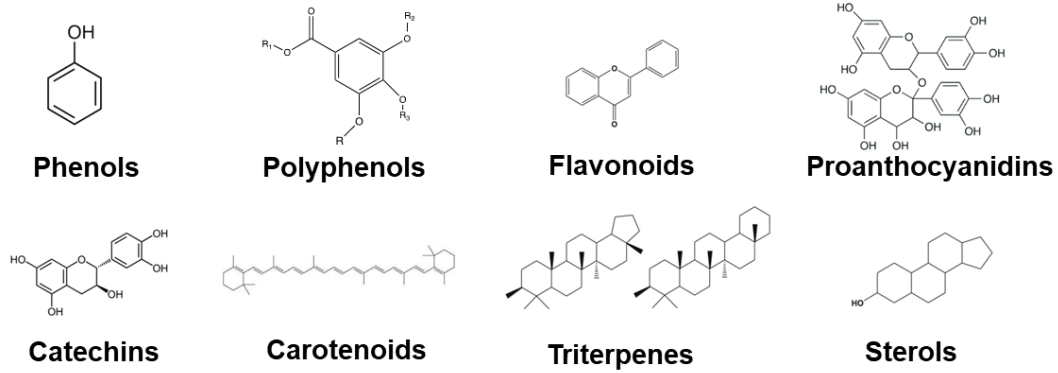
- **Selection of resilient plant**: *Prosopis cineraria* (**Ghaf**), a species thriving in extreme environmental conditions such as water scarcity, nutrient-poor soil, and high temperatures with significant thermal fluctuations.
- **Environmental relevance**: These conditions are expanding globally due to the ongoing climate crisis, emphasizing the need for sustainable solutions.
- **Metabolic adaptation**: Harsh environments effect the production of secondary metabolites (e.g., antioxidants) that plants use to cope with stressful conditions, offering high-value bioactive compounds for cosmetic applications.

Natural sources → **Extraction** → Experimental investigation → Cosmetic formulation

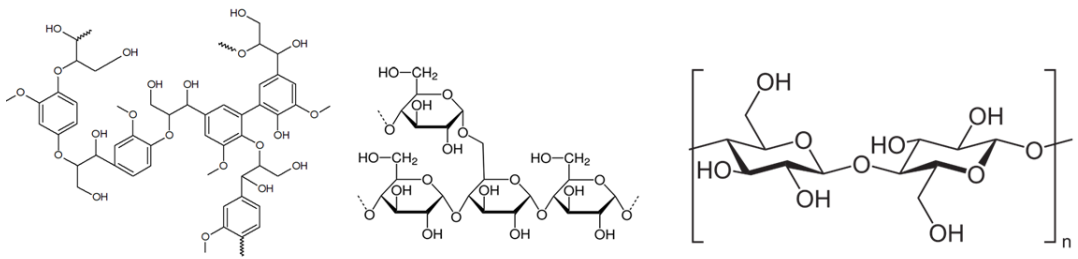
EXTRACTION PROCESS



BIOACTIVE COMPOUNDS



NATURAL POLYMERS



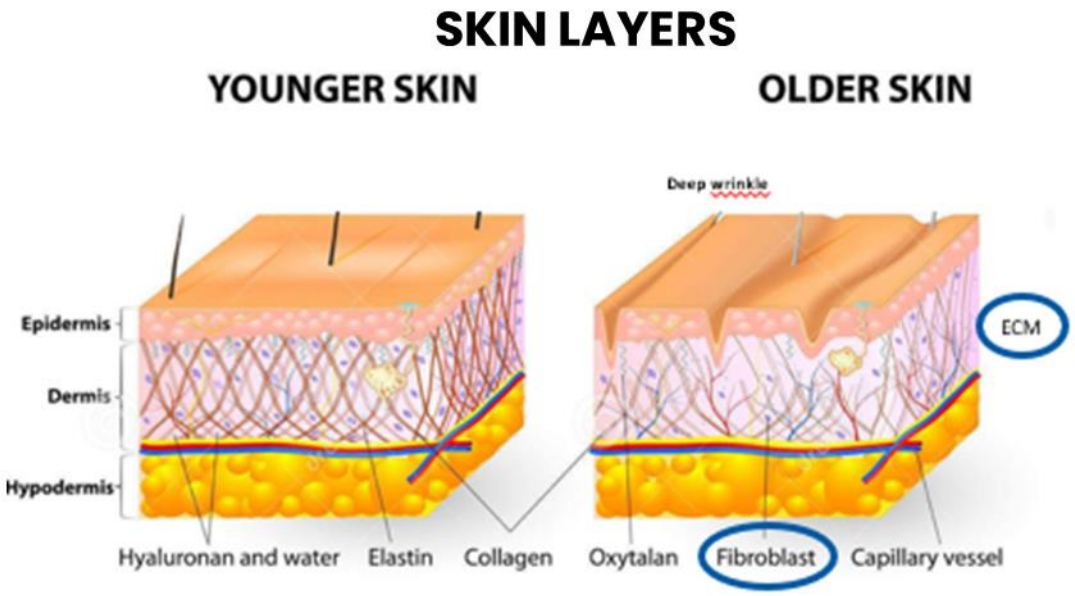
MUSA Design

Sustainable Fashion, Luxury and Design

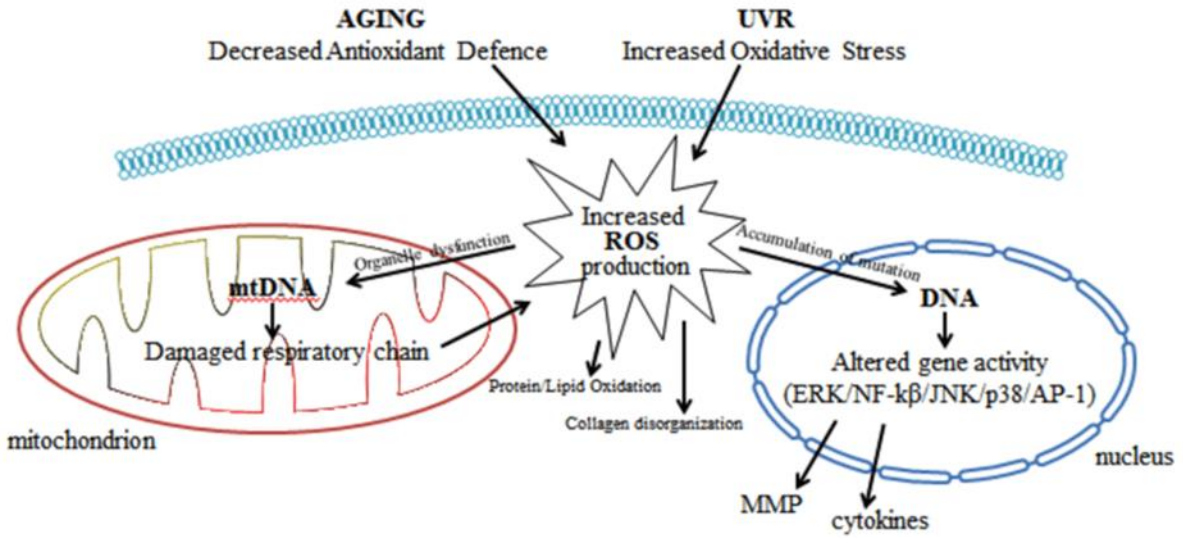
Natural sources → Extraction → **Experimental investigation** → Cosmetic formulation

BIOACTIVE COMPOUNDS

SKIN LAYERS



AGING

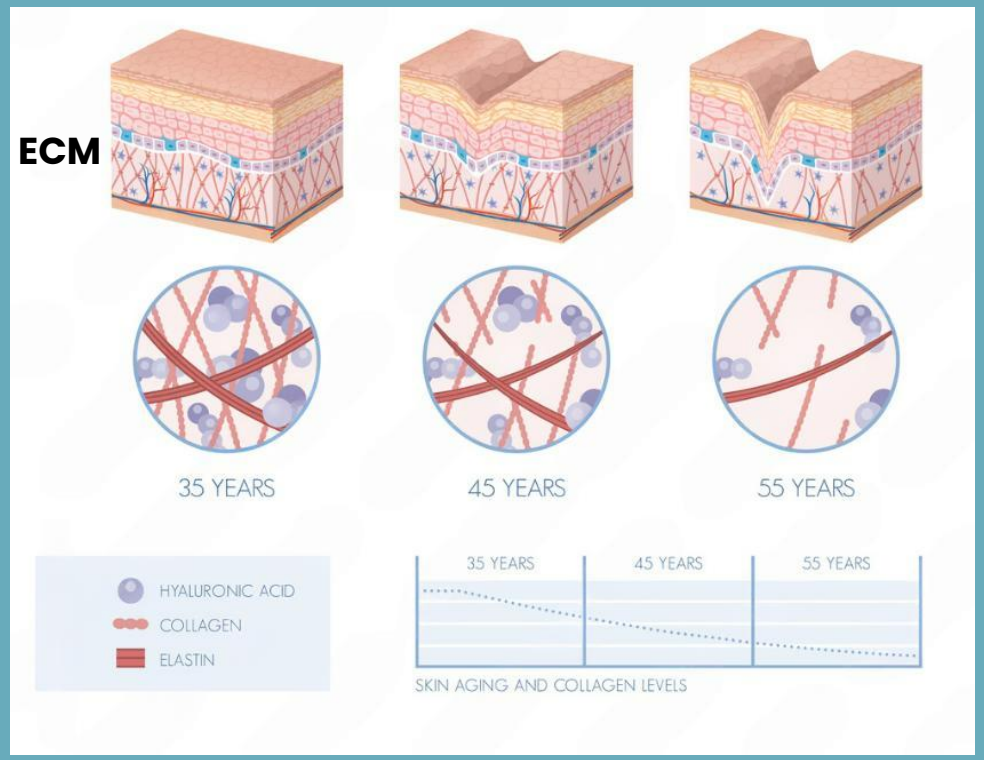


Davinelli, Sergio et al. "Cytoprotective Polyphenols Against Chronological Skin Aging and Cutaneous Photodamage." Current pharmaceutical design 24 2 (2018): 99-105 .

Natural sources → Extraction → **Experimental investigation** → Cosmetic formulation

BIOACTIVE COMPOUNDS

SKIN AGING



Key Findings

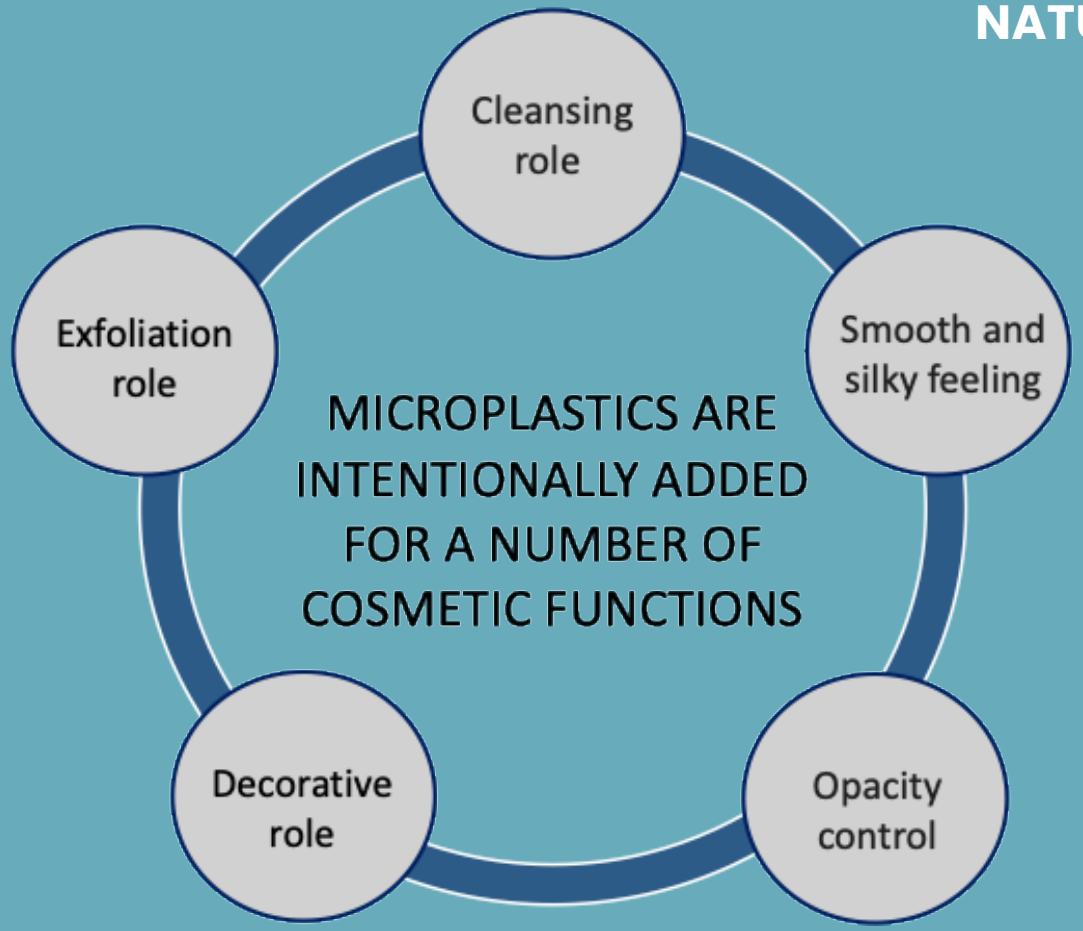
- Proved **safety**
- In vitro enzymatic tests demonstrate that the extracts **effectively inhibit elastase, collagenase, and hyaluronidase,** crucial in the remodeling of the extracellular matrix during skin aging
- High **antioxidant** potential

Cosmetic Potential

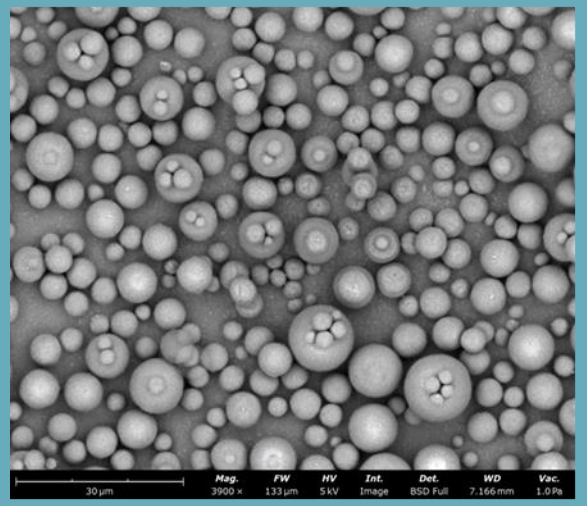
- **Slows down degradation** of key structural components (elastin, collagen, hyaluronic acid).
- Supports the maintenance of skin elasticity and firmness. Promising **application in anti-aging skincare formulations.**

Natural sources → Extraction → **Experimental investigation** → Cosmetic formulation

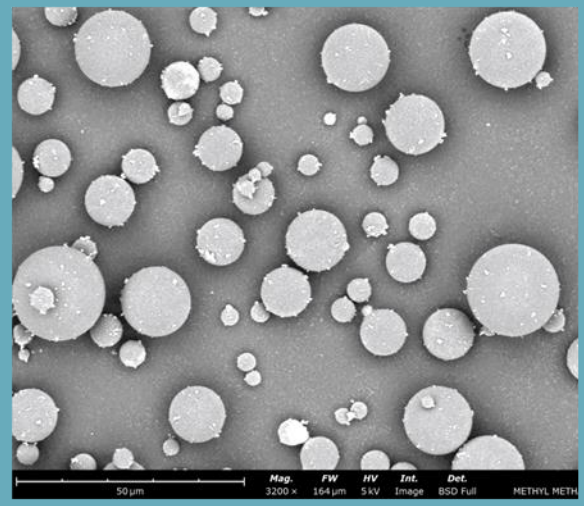
NATURAL POLYMERS



POLYMETHYL METHACRYLATE



METHYL METHACRYLATE TRIMETHYLOL HEXYLCROSSPOLYMER

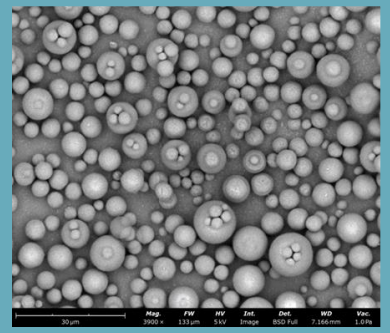


SEM images of polymer microparticles

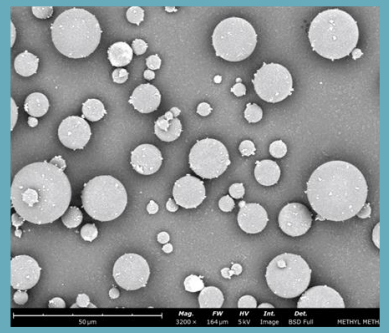
Natural sources → Extraction → **Experimental investigation** → Cosmetic formulation

NATURAL POLYMERS

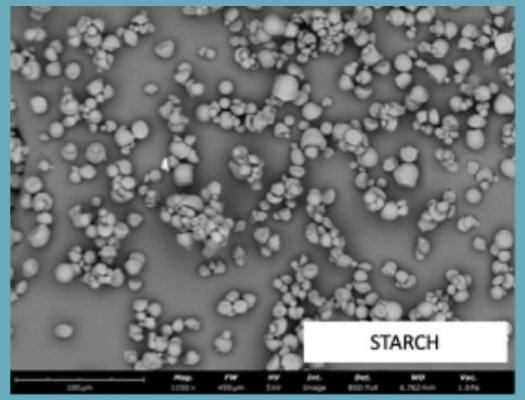
POLYMETHYL METHACRYLATE

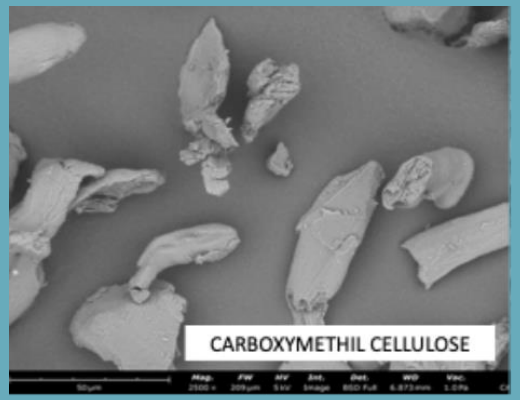


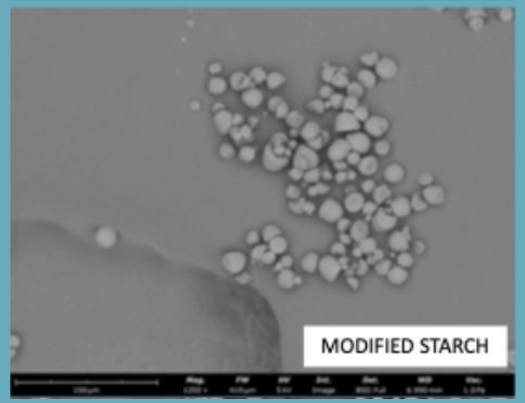
METHYL METHACRYLATE TRIMETHYLOL HEXYLCROSSPOLYMER

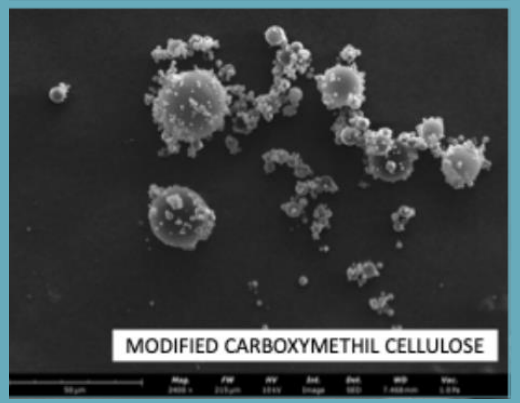


SEM images of polymer microparticles









Chemical modification

Natural sources → Extraction → **Experimental investigation** → Cosmetic formulation

BIOACTIVE COMPOUNDS

- Safety
- Promising in inhibiting key enzymes associated with skin degradation
- Strong antioxidant activity

NATURAL POLYMERS

- Production of spherical microparticles by using green protocols
- Materials obtained have a considerable potential to replace synthetic materials in cosmetic products

Natural sources → **Extraction** → **Experimental investigation** → **Cosmetic formulation**

NANOCOSPHA

MUSA

Production and characterization

Emulsifier

Rheometer

Texture analyzer

Efficacy test

Visioscan

Cutometer

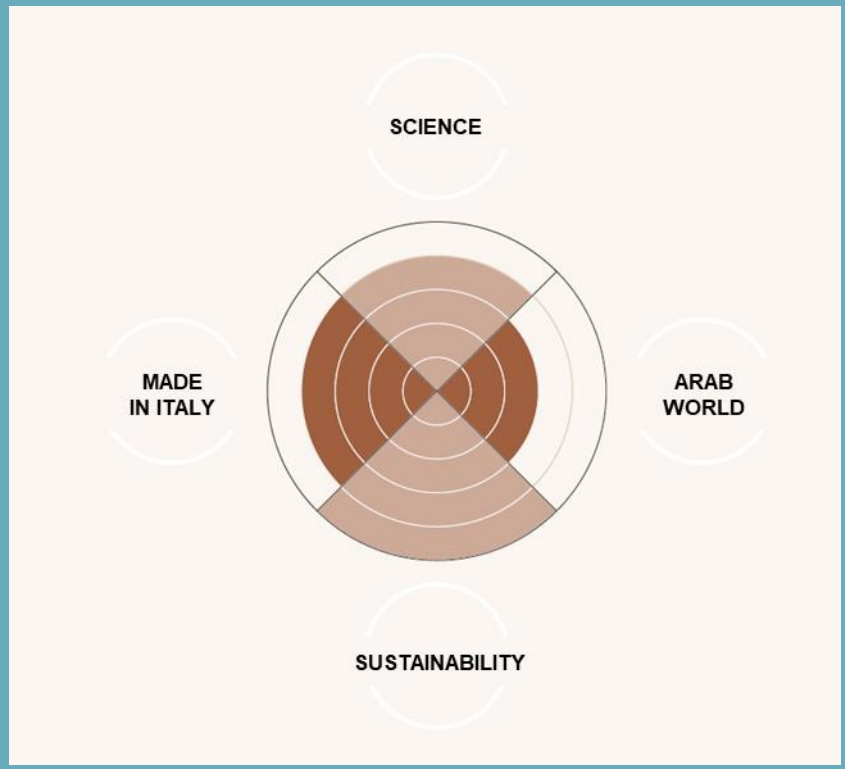
Corneometer

MUSA Design

Sustainable Fashion, Luxury and Design

Natural sources → Extraction → Experimental investigation → **Cosmetic formulation**

TARGET



Paolo Galli

Professor of Ecology
Visiting Professor University of Dubai
Director of MaRHE Center Maldives

MaRHE

Miriam Colombo

Professor in Clinical biochemistry

NANOCOSPHA

THANK YOU

MaRHE MUSA UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

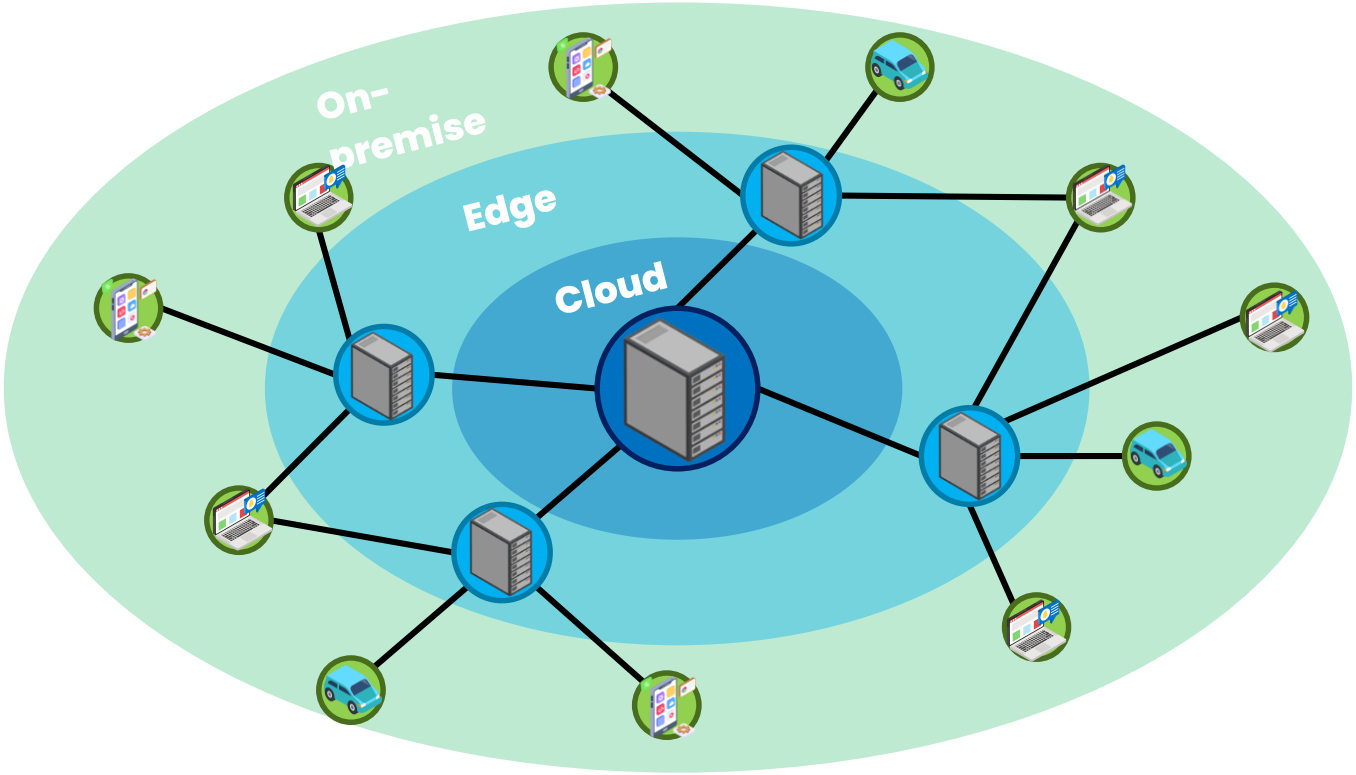
NANOCOSPHA

SMART SERVICE DEPLOYMENT IN THE MUSA CLOUD-EDGE CONTINUUM

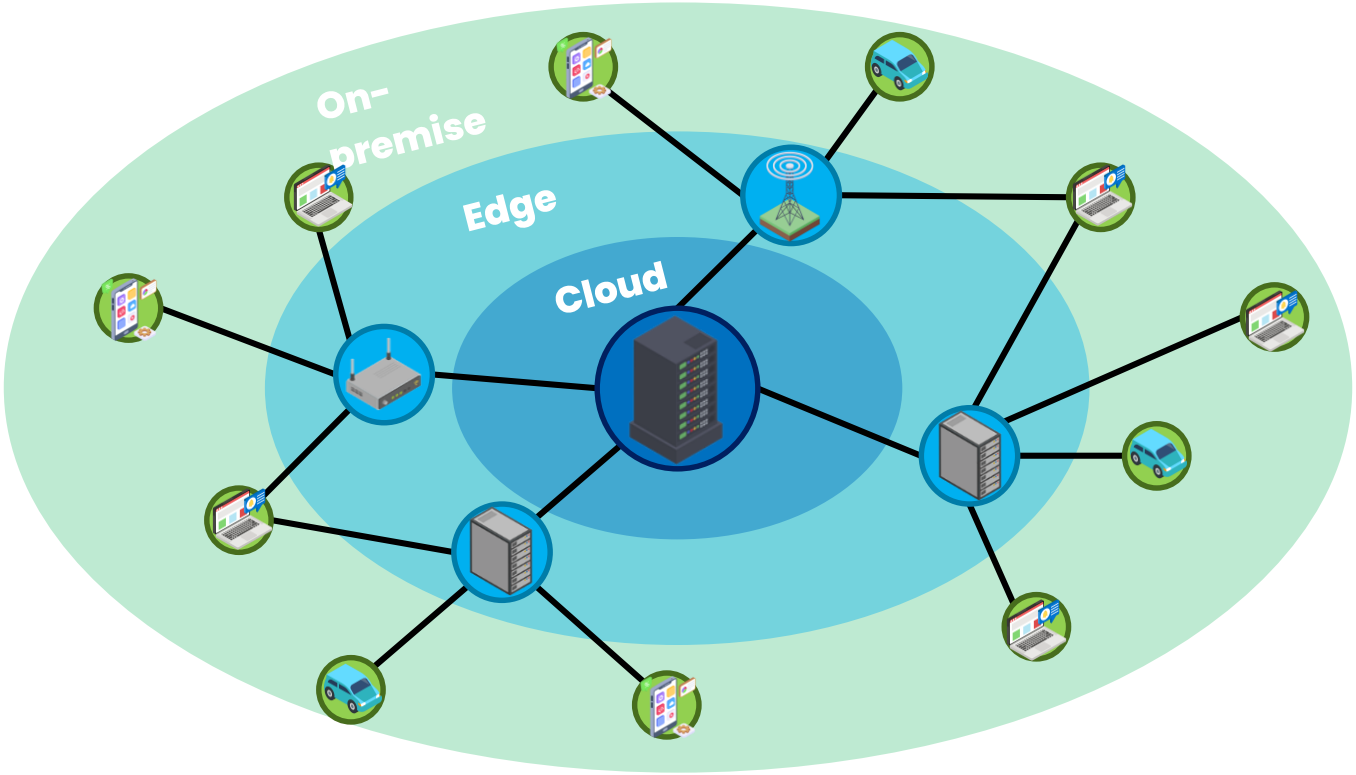
Ruslan Bondaruc

Spoke 2, UNIMI

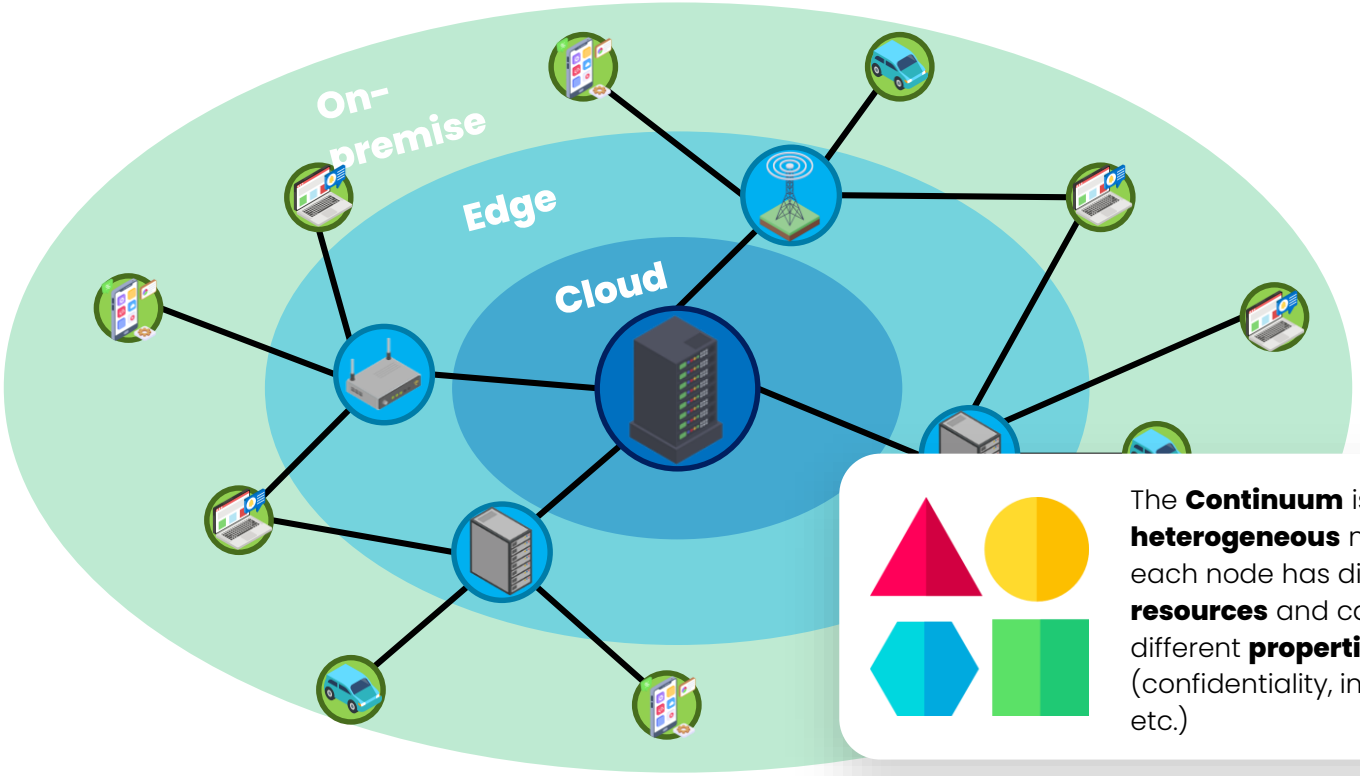
THE CLOUD-EDGE CONTINUUM



THE CLOUD-EDGE CONTINUUM

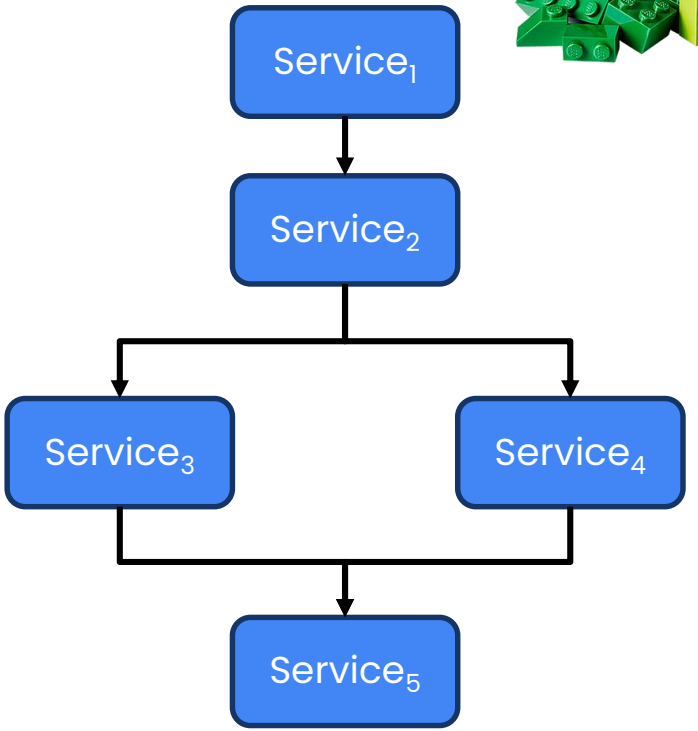


THE CLOUD-EDGE CONTINUUM

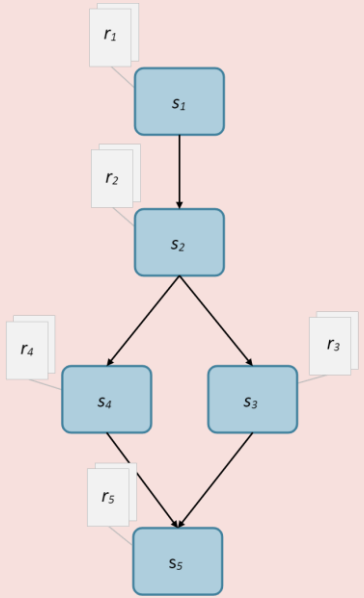


The **Continuum** is a **heterogeneous** network: each node has different **resources** and can provide different **properties** (confidentiality, integrity, etc.)

FROM MONOLITHS TO COMPOSITIONS OF SERVICES

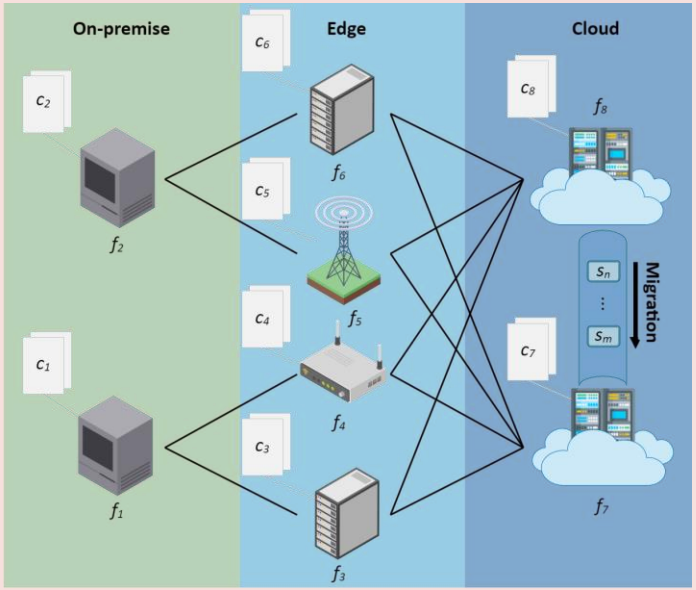


SCENARIO



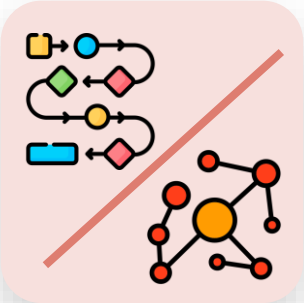
Users deploying workflows of **services s_i**, each with **non-functional requirements r_i**

DEPLOY



Providers offering deployment **facilities f_i**, each providing specific **capabilities c_i**

OVERVIEW

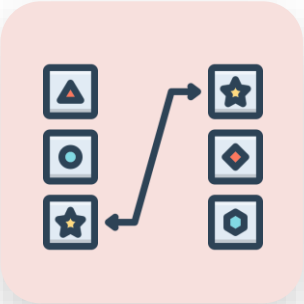


01.

Models to represent workflows and the Continuum

02.

Matching to compute the possible deployment strategies



03.

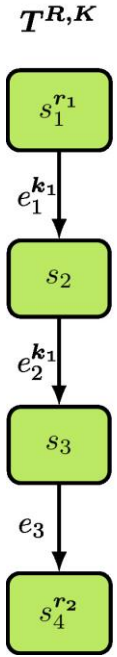
Optimization to select the best strategy

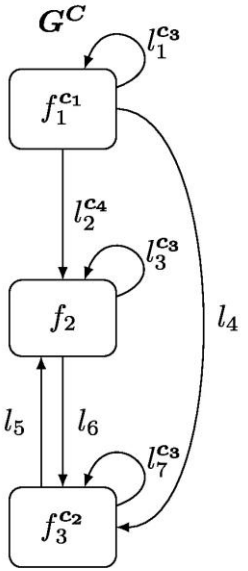
MODELS

We model **workflows** of services and Continuum **facilities**

An **Annotated Service Composition Graph $T^{R,K}$** is

- a directed graph ***T = (S,E)***
- annotated with requirements ***r***





MODELS

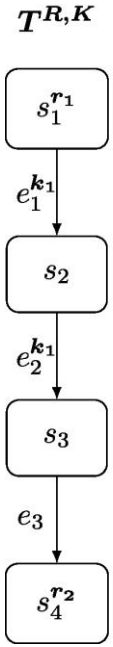
We model **workflows** of services and Continuum **facilities**

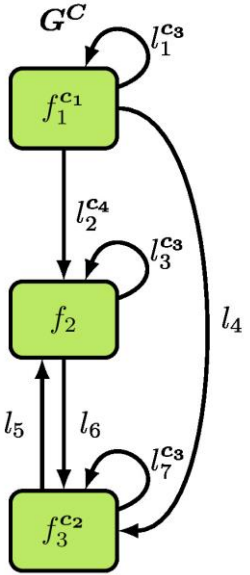
An **Annotated Service Composition Graph $T^{R,K}$** is

- a directed graph ***T = (S,E)***
- annotated with requirements ***r***

An **Annotated Deployment Facilities Graph G^C** is

- a directed graph ***G = (F, L)***
- annotated with capabilities ***c***

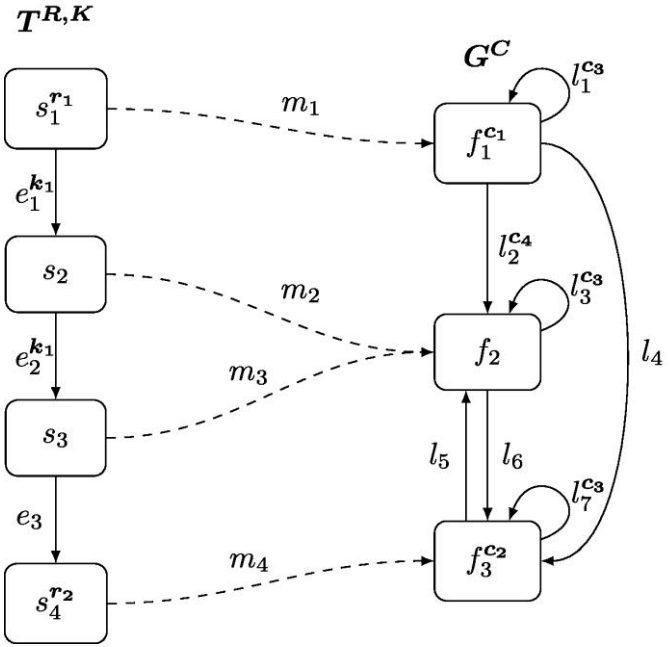




MATCHING

Searches for the **set of possible solutions** for the QoS-aware deployment

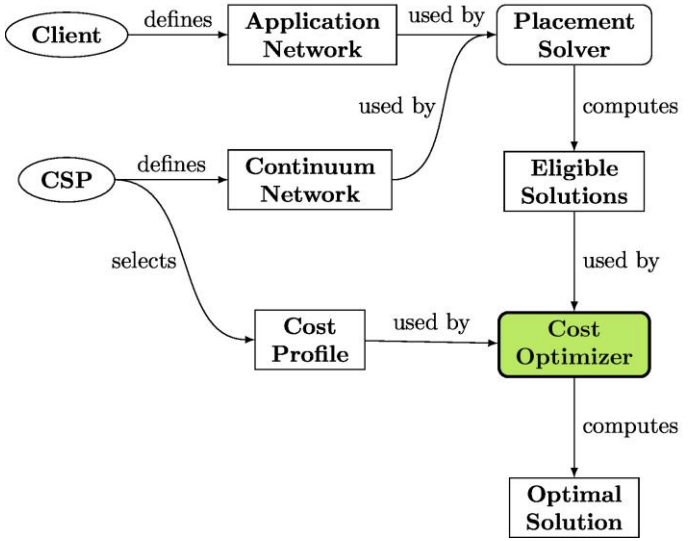
- Takes as **input** the **annotated models**
- Generates a **set of suitable solutions *M***
- If ***M*** is **empty**, the deployment **cannot take place** under the specified requirements



OPTIMIZATION

Searches for the **most suitable solution** for the QoS-aware deployment

- Takes as **input** the **eligible solutions** and the provider's **cost profile** (e.g., lowest operational cost)
- Selects the one better **satisfying the profile**
- Different approaches can be applied (heuristics, metaheuristics, ML, etc.)



FOSTERING INNOVATION AND SHARING

This project paves the way to resource **sharing** in the **MUSA economy**

- Services
- Data
- Computational resources

Benefits:

- Improve **value** of resources
- Enhance research **quality**
- Faster **innovation** and time to market

KEY TAKEAWAYS AND NEXT STEPS

The Cloud-Edge Continuum unlocks new opportunities for service deployment, fostering innovation and sharing

Let's collaborate to turn the potential of the Continuum into tangible outcomes

3rd MUSA General Meeting

Monday 9th December 2024, 11.30-12.30

Session: DIGITAL TRANSFORMATION

EVIDENCE INFORMED HOSPITAL ASSESSMENT Tech for safety, comfort and sustainability with the project SustHealth ESG

Andrea Brambilla, **Andrea Rebecchi, Stefano Capolongo**
Design&Health Lab., DABC Politecnico di Milano, Milan, Italy
andrea1.brambilla@polimi.it

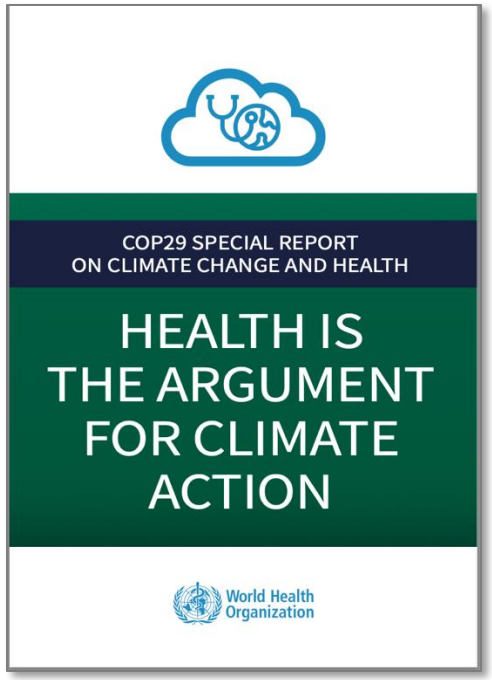
POLITECNICO MILANO 1863 | DEPARTMENT OF ARCHITECTURE BUILT ENVIRONMENT AND CONSTRUCTION ENGINEERING

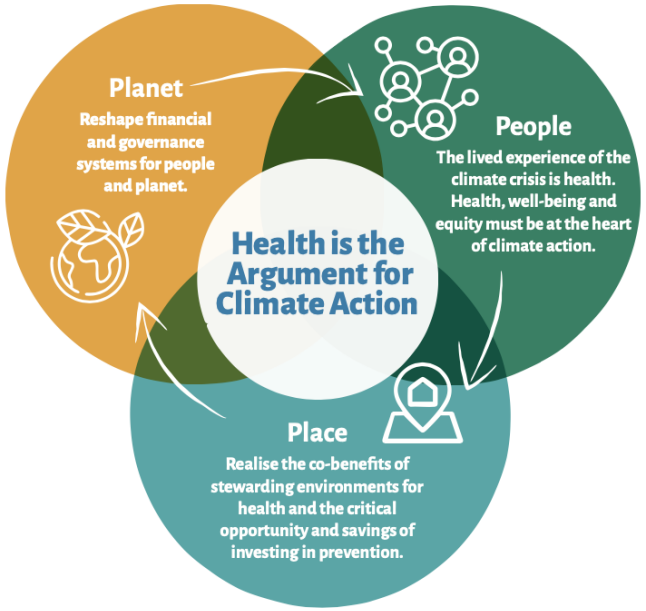
DESIGN HEALTH ABCLAB

BACKGROUND & RESEARCH GAP

SUSTAINABILITY AS A CONTEMPORARY CHALLENGE

If healthcare systems were a country, it would be among the worst pollutants in the world.





Pichler PP et al: International comparison of health care carbon footprints. Environ. Res. Lett. 2019; 14 064004.

COP29 Baku Azerbaijan

COP29 United Nations Climate Change Conference. Special Report on Climate Change and Heatlh by WHO to be discussed in Baku Azerbaijan 12-18 November 2024

BACKGROUND & RESEARCH GAP

THE EUROPEAN SCENARIO

70%

HOSPITAL INFRASTRUCTURES ARE OBSOLETE

D&H LAB, 2022

FROM 2026

MANDATORY SUSTAINABILITY REPORTING

EUROPEAN REGULATION CSRD + ITALIAN LAW "GREEN HOUSES", 2024

+90%

HOSPITAL ENERGY COST INCREASE IN 2021-2022

AGENAS, 2023

FROM 2028

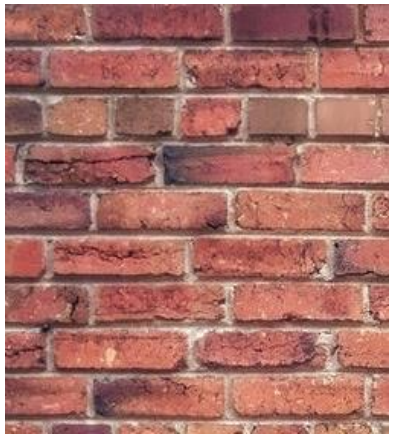
ZERO EMISSION NEW CONSTRUCTIONS

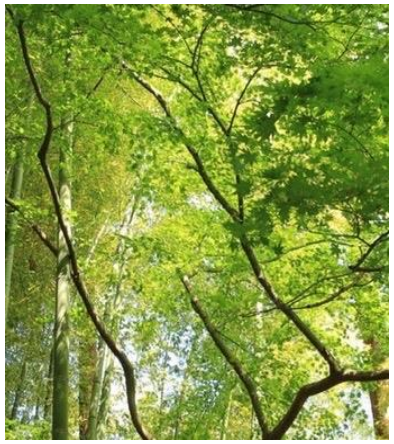
EUROPEAN REGULATION CSRD + ITALIAN LAW "GREEN HOUSES", 2024

BACKGROUND & RESEARCH GAP

IMPACT OF BETTER HEALTHCARE ENVIRONMENTS

VIEWS ON GREEN OR ON WALLS?





Patients with green views shows:

- Reduction stree (1)
- Reduction drugs (2)
- Increase Satisfaction (4)
- Better parameters (2)
- Reduction Length of stay(2)
- Reduction General costs(3)

STANDARD OR EVIDENCE-BASED HOSPITAL ?

Standard Hospital

"Evidence-based" Hospital

- Large single rooms
- Acuity adaptable rooms
- Large windows
- Healing gardens
- Sustainability

=

+ $ 12 M (CAPEX) Increase investment

- Falls reduction
- Hospital Infection reduction
- Turnover reduction for nurse due to burnout

=

- $ 11 M (OPEX) Reduction annual expense

(1) Ulrich 1984;. (2) Minton et al, 2016. (3) Andrade et al, 2017. (4) MacAllister et al, 2016

Berry et al, 2004; 2011

OBJECTIVE: Develop and Test an Evidence Based Tool for Hospital Sustainability assessment

CONTEXT — VALIDATION — IMPLEMENTATION — TEST

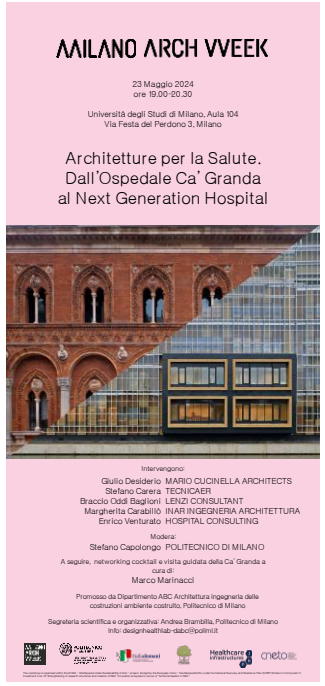
POLITECNICO MILANO 1863

CHALMERS UNIVERSITY OF TECHNOLOGY

Regione Lombardia

eit | JUMPSTARTER

Funded by the European Union

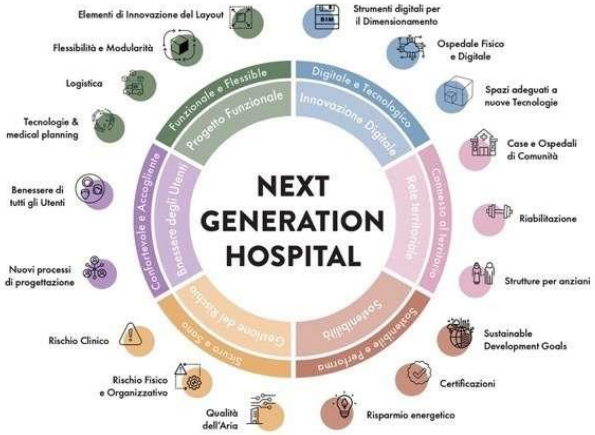


SWITCH 2 PRODUCT INNOVATION CHALLENGE

BH

spin off® POLITECNICO DI MILANO

Registrata come srl SOCIETA' BENEFIT



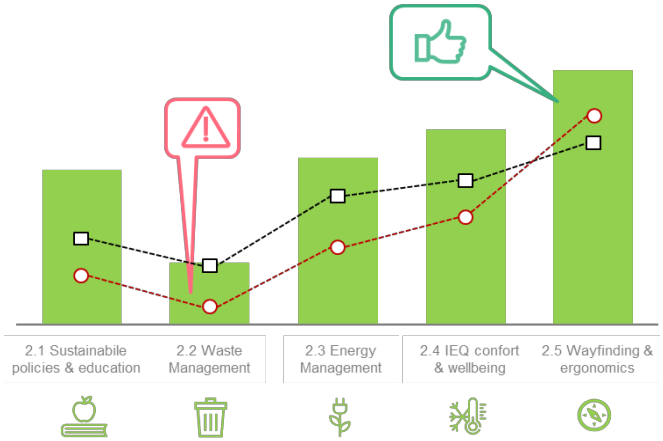
Healthcare Infrastructures JPR

MUSA Tech

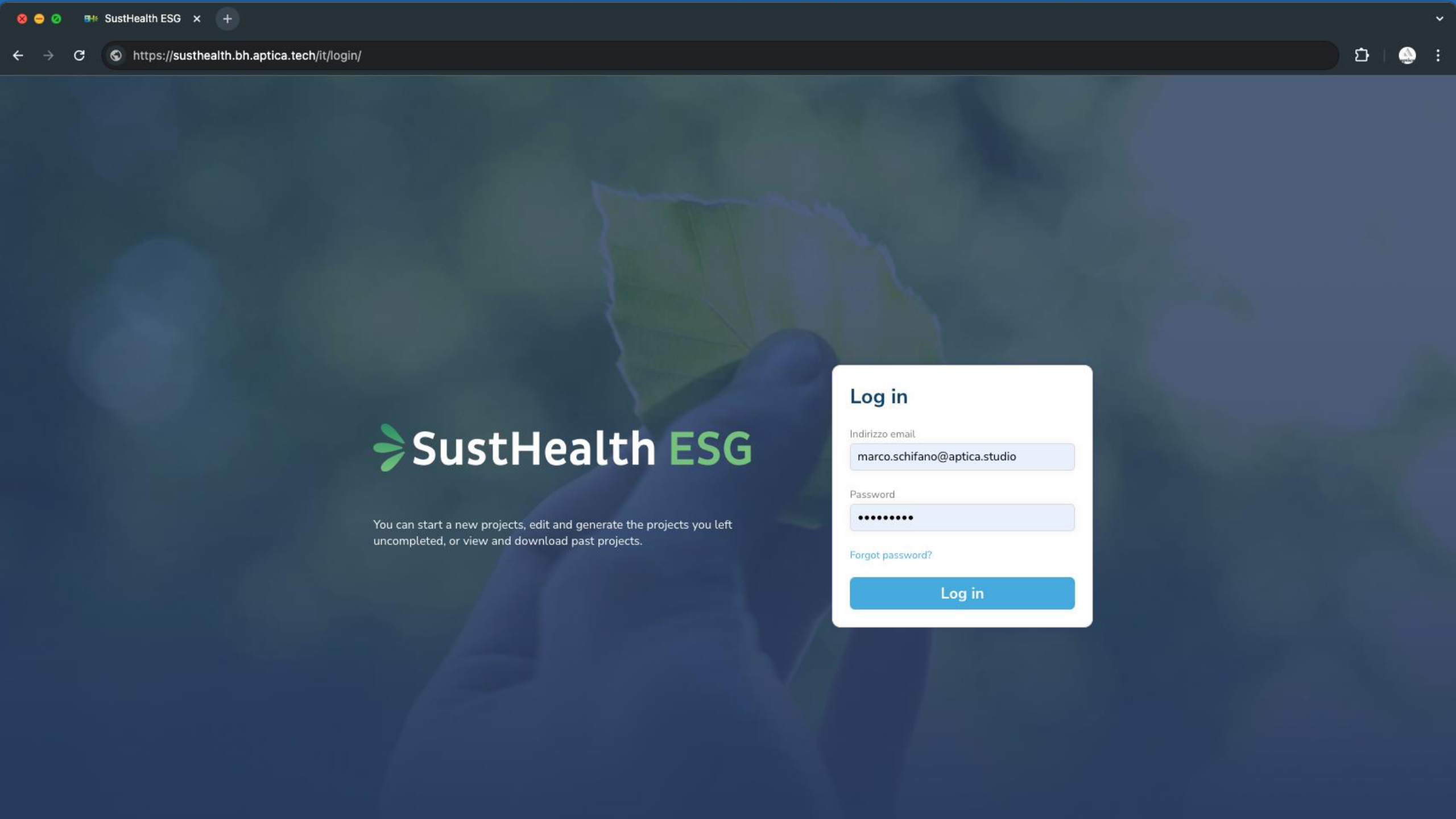
Deep Tech: Entrepreneurship & Technology Transfer

SOLUTION:

"SustHealth ESG Assessment" Platform



- Holistic, evidence-based monitoring system that assesses ESG factors, enabling healthcare facilities to identify specific areas for improvement.
- It provides a comprehensive framework to optimise both the overall sustainability and global performance of the organisation.


SustHealth ESG
https://susthealth.bh.aptica.tech/it/login/
SustHealth ESG
You can start a new projects, edit and generate the projects you left uncompleted, or view and download past projects.
Log in
Indirizzo email
marco.schifano@aptica.studio
Password
Forgot password?
Log in

RESULTS

ADVANTAGES OF SUSTHEALTH ESG

Susthealth offers a comprehensive monitoring system that uniquely combines environmental sustainability, clinical and organisational processes and aligns with European healthcare systems.

RELIABLE

- **Science-based and constantly updated**
- **Weighted with MCDA* SFR DCM methodology ****
- **Tested on pilot cases in Europe**

RAPID

- **Predefined list of criteria**
- **Binary evaluation system**
- **Dashbord with clear and concise results**
- **Reduces decision-making time by 90%**

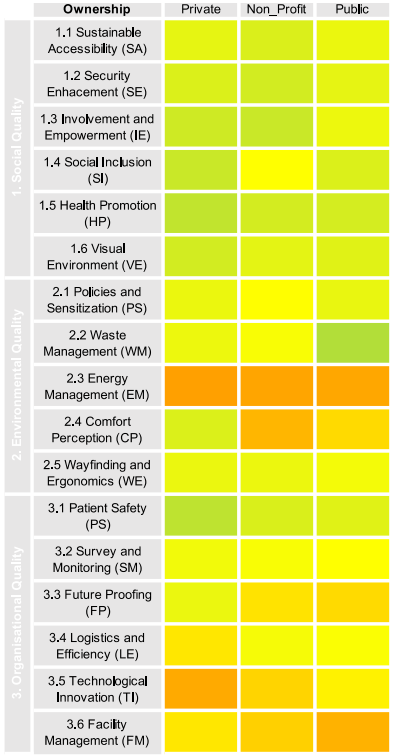
REPLICABLE

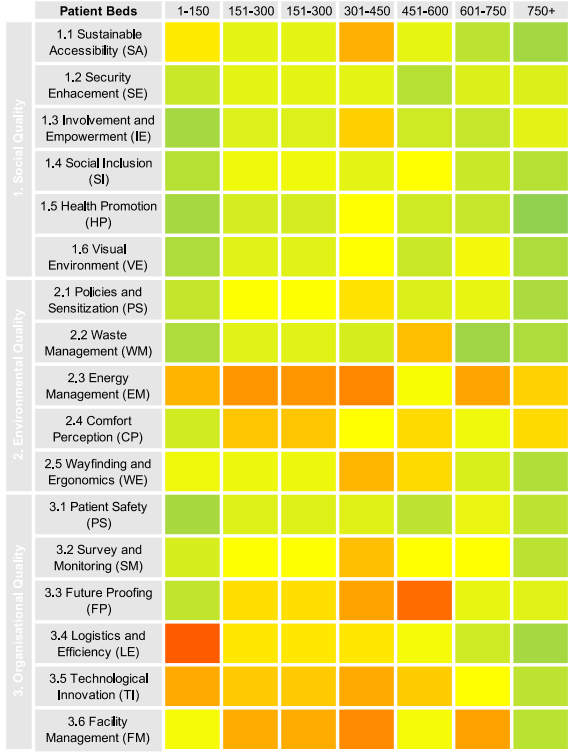
- **Automatic data collection and semi-automatic reporting**
- **Modular structure for different types of infrastructure**
- **Continuous monitoring of EPC contracts**

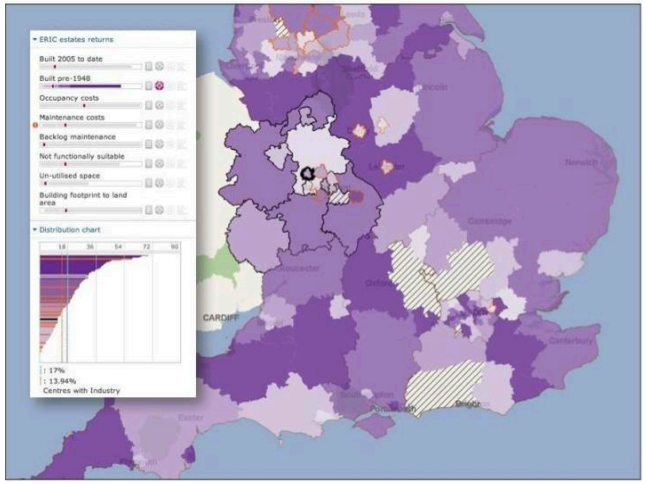
*MCDA: Multiple Criteria Decision Analysis; **SFR DCM: Simon Roy Figueras Deck of Card Method

CONCLUSIONS & IMPACTS

EVIDENCE BASED DECISION MAKING







Health Infrastructure Plan

A new, strategic approach to improving our hospitals and health infrastructure

DESIGN HEALTH ABCLAB

WHO Collaborating Center for Design & Health: Healthcare Infrastructures Planning, Design and Evaluation

POLITECNICO MILANO 1863

HSBA HAMBURG SCHOOL OF BUSINESS ADMINISTRATION

CONCLUSIONS & IMPACTS

ROADMAP

MVP Software Development

MILESTONE 1
TRL: 4 → 6

S1 2025

Start-up Healthcare sector Test Case

MILESTONE 2
TRL:6 → 7

S2 2025

Scale up other sectors

MILESTONE 3
TRL:7 → 9

2026

"The first step

in achieving the desired outcome of

high-quality & cost-effective care

is ensuring that

the **right physical structures** are in place."

Martin McKee and the European Observatory on Health Care Systems

"Hospitals in a Changing Europe", 2002

Finanziato dall'Unione europea NextGenerationEU
Ministero dell'Università e della Ricerca
Italiadomani
MUSA

3rd MUSA General Meeting

Monday 9th December 2024, 11.30-12.30

Session: DIGITAL TRANSFORMATION

EVIDENCE INFORMED HOSPITAL ASSESSMENT Tech for safety, comfort and sustainability with the project SustHealth ESG

Andrea Brambilla, **Andrea Rebecchi, Stefano Capolongo**
Design&Health Lab., DABC Politecnico di Milano, Milan, Italy
andrea1.brambilla@polimi.it

POLITECNICO MILANO 1863 | DEPARTMENT OF ARCHITECTURE BUILT ENVIRONMENT AND CONSTRUCTION ENGINEERING

DESIGN HEALTH ABCLAB

MUSA Tech

Deep Tech: Entrepreneurship & Technology Transfer

Finanziato dall'Unione europea NextGenerationEU
Ministero dell'Università e della Ricerca
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA
MUSA

MUSA

MULTILAYERED URBAN SUSTAINABILITY ACTION

Spoke 3: MUSA **Tech**

CUTTING-EDGE TECHNOLOGIES FOR SPACE-BASED COMMUNICATIONS

Mirko Siano, Unimi

9 December 2024

SPACE-BASED optical communications

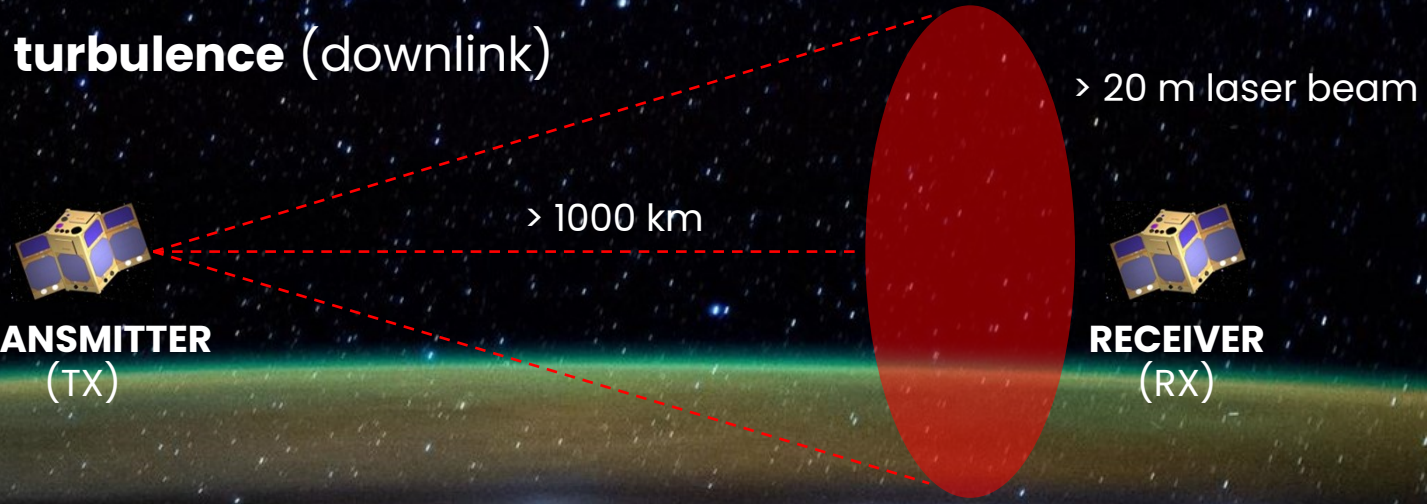
In the forthcoming years, more **constellations of satellites** will be implemented and will form the **backbone of space-based internet**

INTERNET ACCESS DEMAND vs TIME

SATELLITE LAUNCHING COST vs TIME

MAIN challenges

- **Increase** data rates with novel transmission protocols
- **Large** beam size at receiver
- Air **turbulence** (downlink)

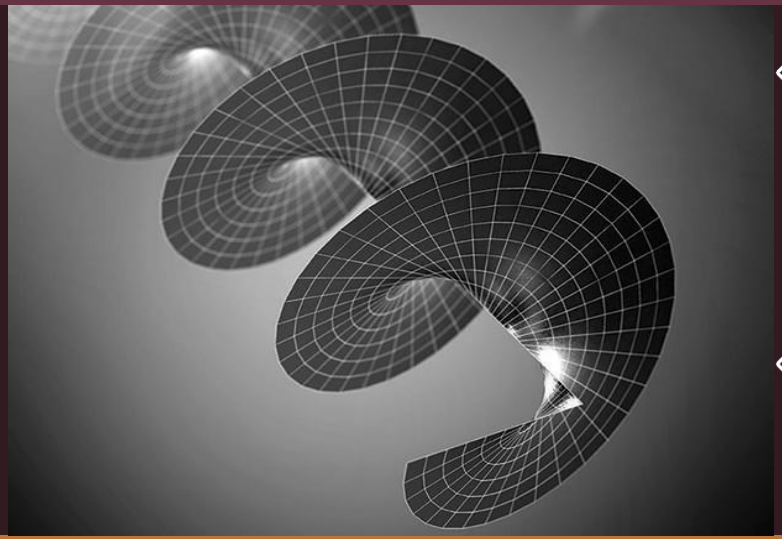


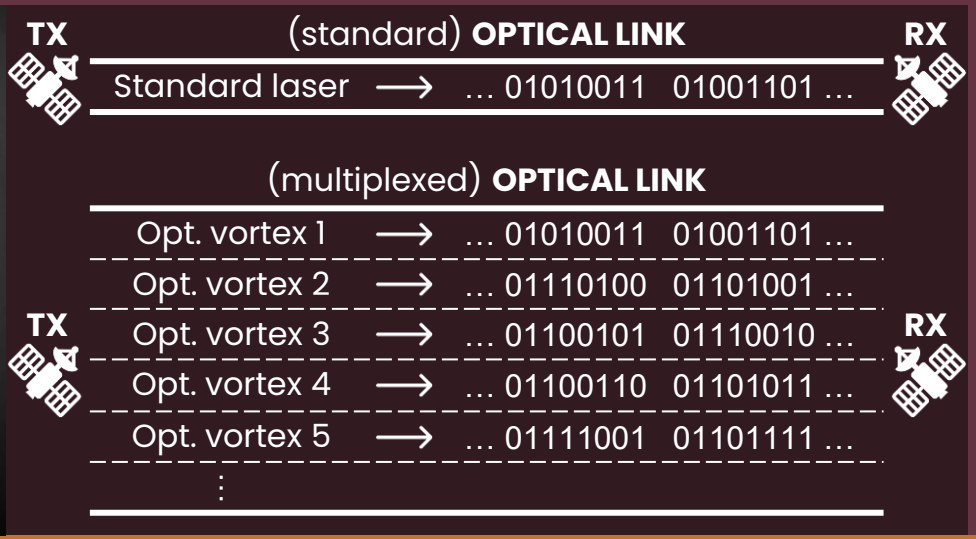
UNIMI unique solution

Multiplex-demultiplex information
with disruptive laser beam shaping, control and detection
(2 PCT patents owned by UNIMI)

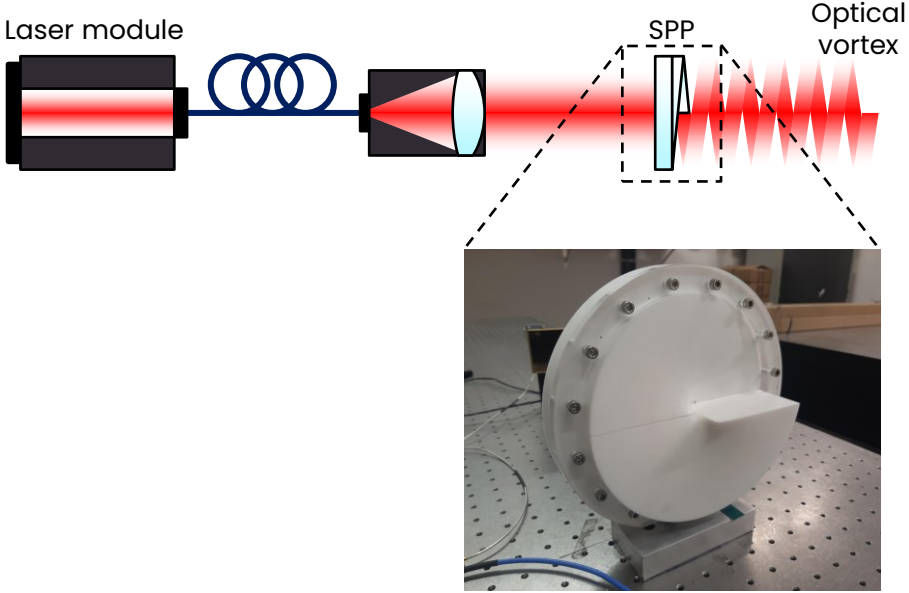
TX SYSTEM: optical vortices

We transform standard laser beams into different **optical vortices**, combined to realize multiple **parallel communication channels**.

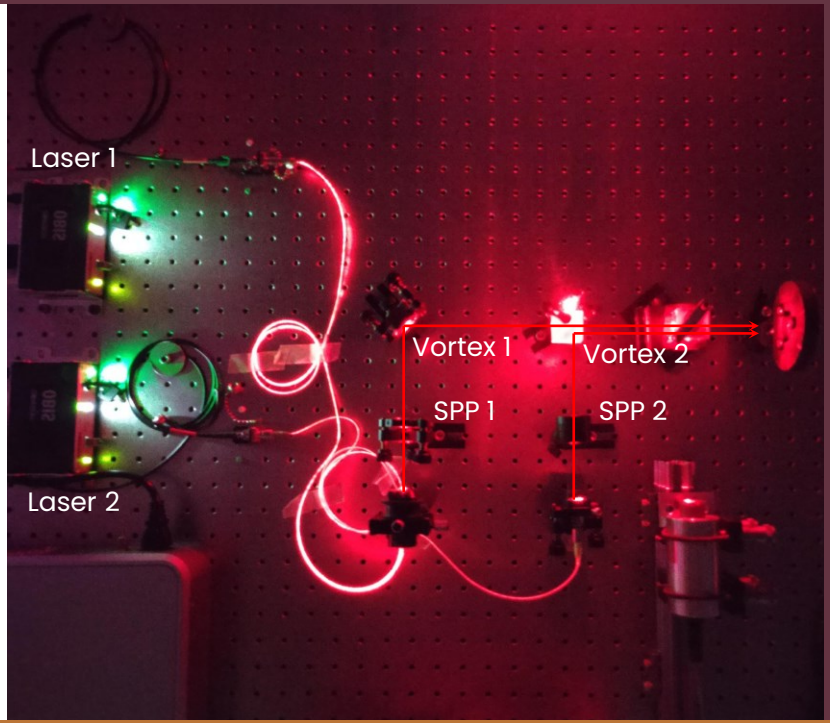




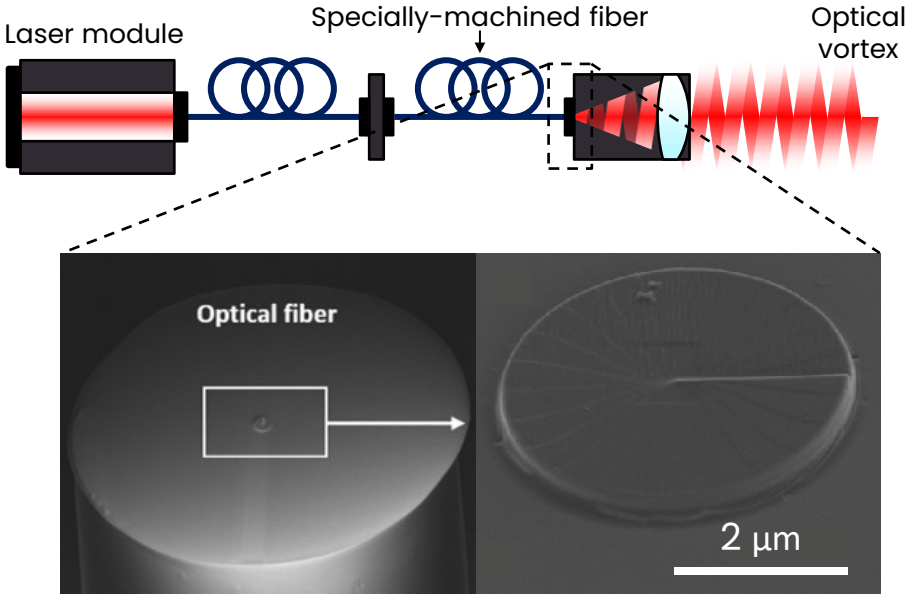
TX SYSTEM: optical vortices



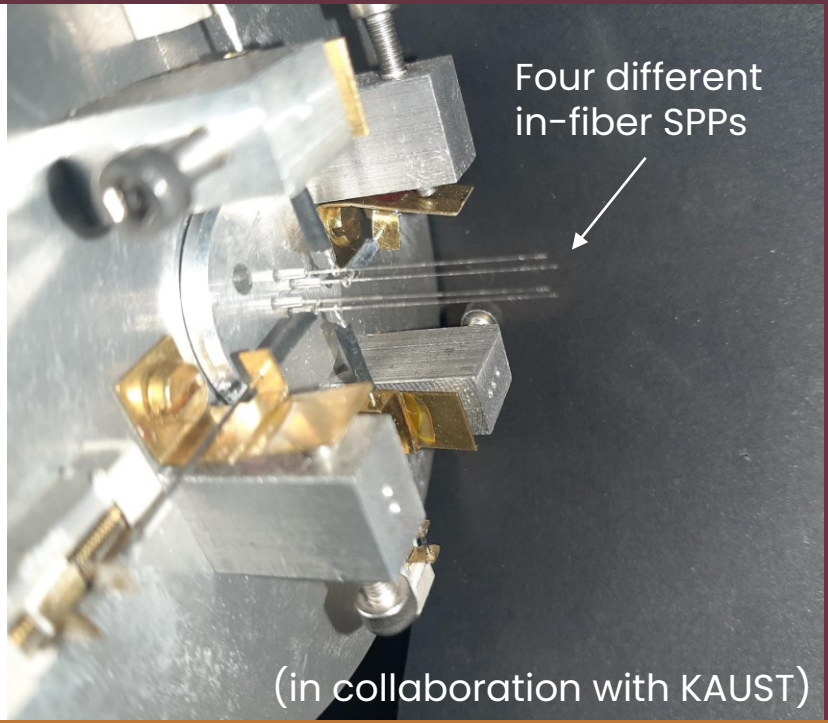
In-air Spiral Phase Plate (SPP)



TX SYSTEM: optical vortices



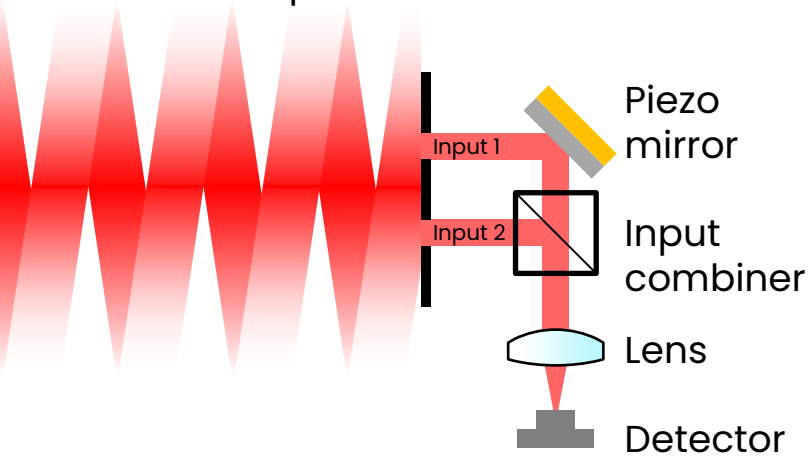
In-fiber Spiral Phase Plate (SPP)

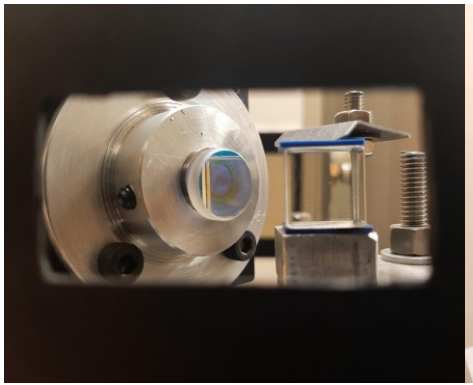


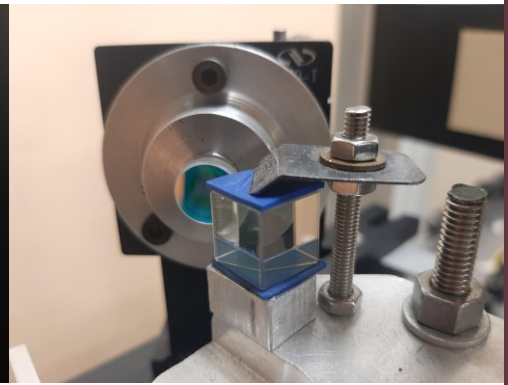
RX SYSTEM: local detection

We use **interference phenomena** to recognize the transmitted information collecting only a **small portion** of the entire beam

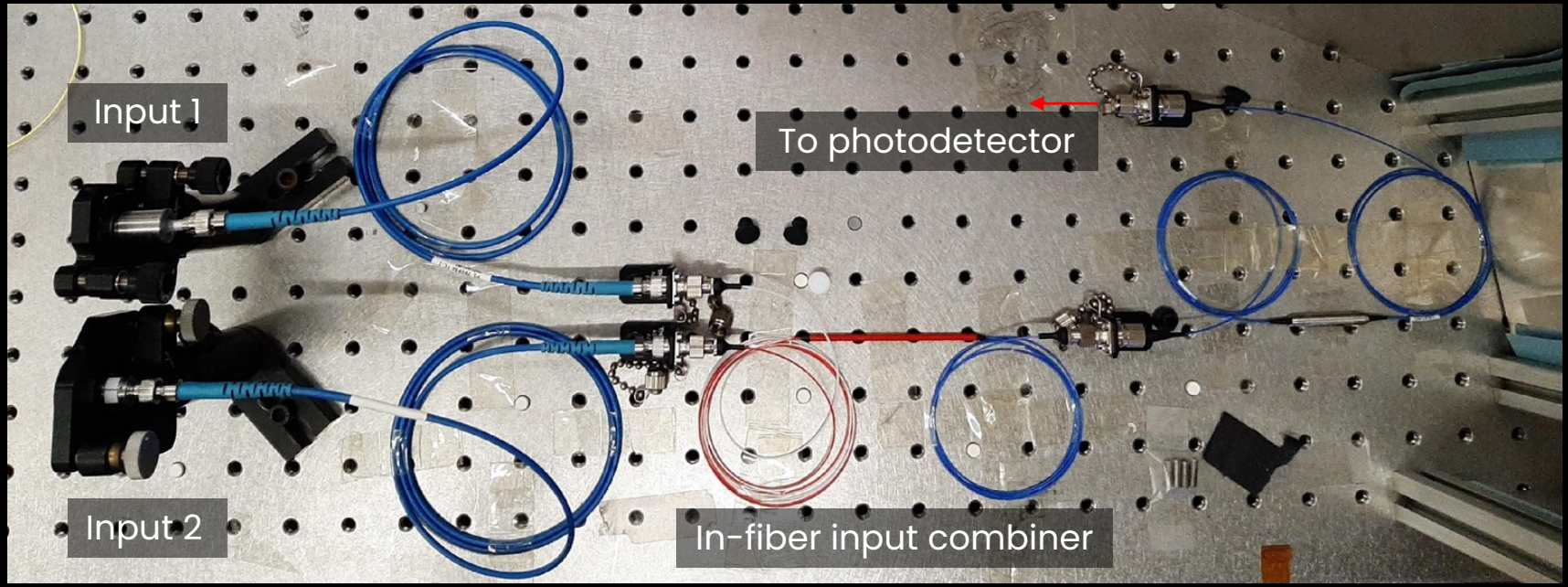
Transmitted optical vortex







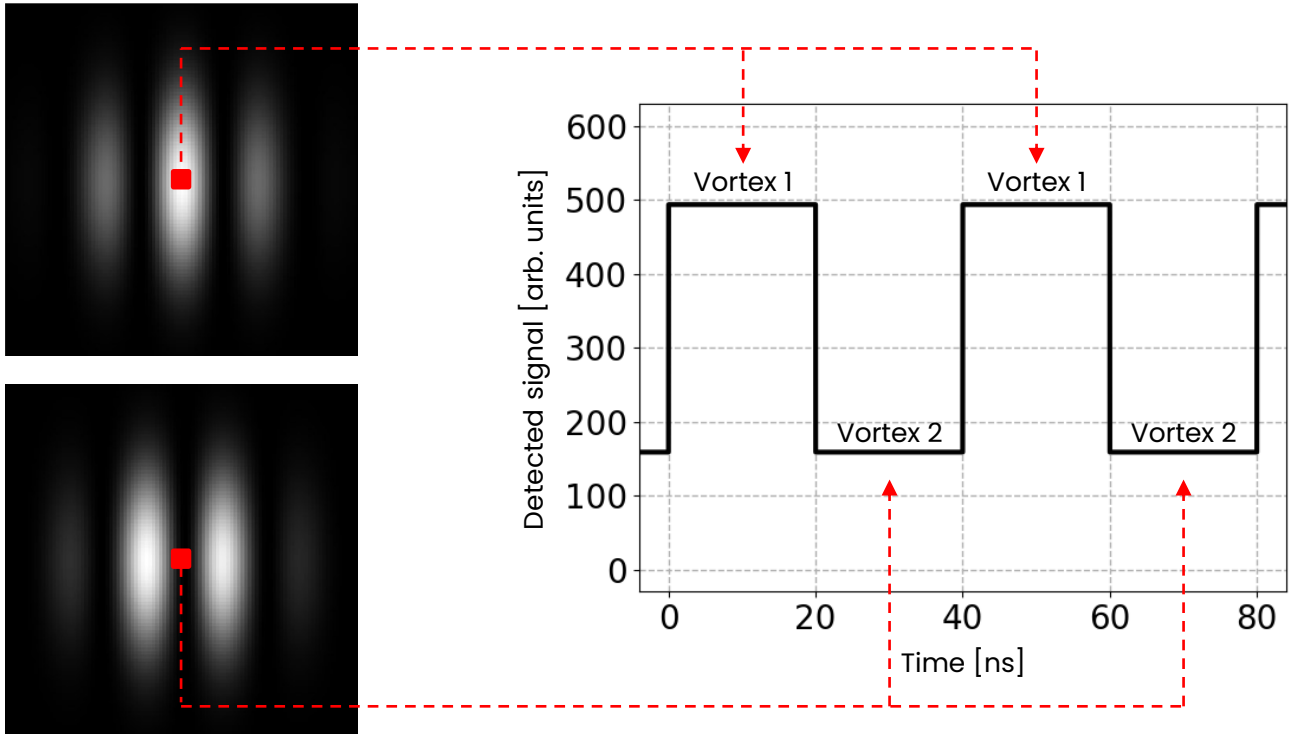
RX SYSTEM: local detection



RX SYSTEM: local detection

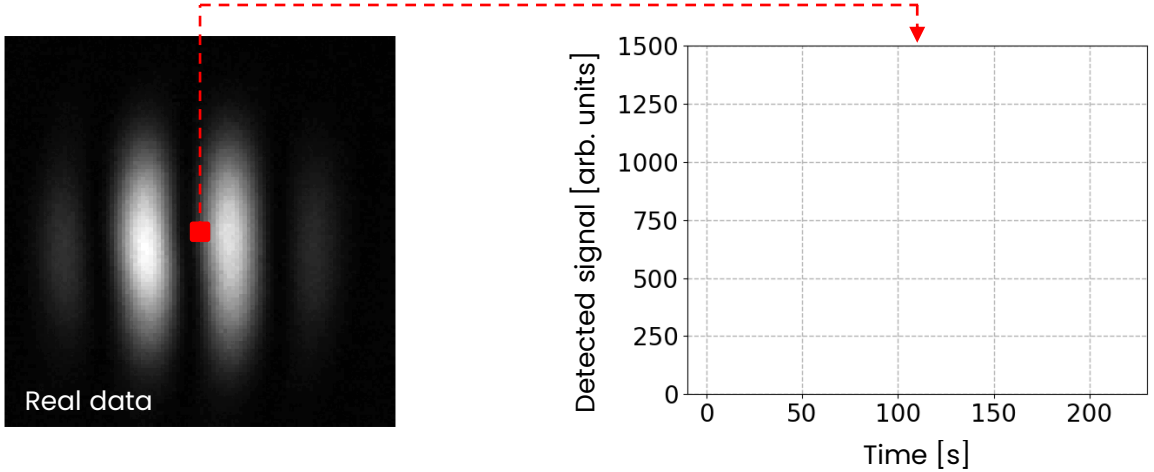
Vortex 1

Vortex 2



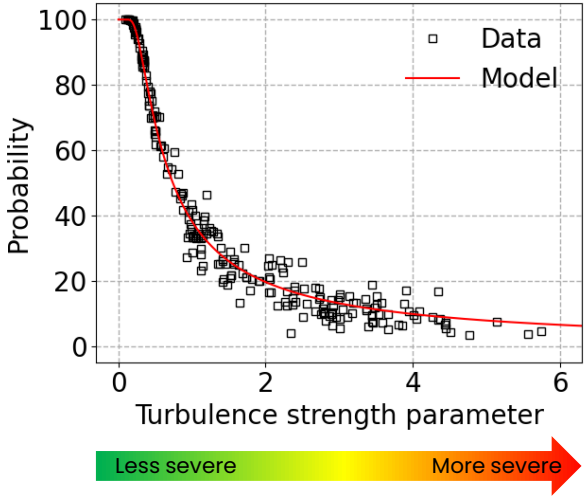
TURBULENCE effects

Turbulence **distorts** optical vortices, and the detected signal **randomly varies** in time.

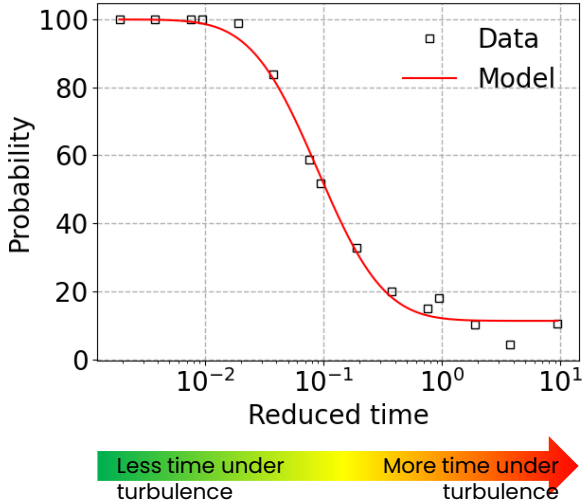


STATISTICAL study of turbulence effects

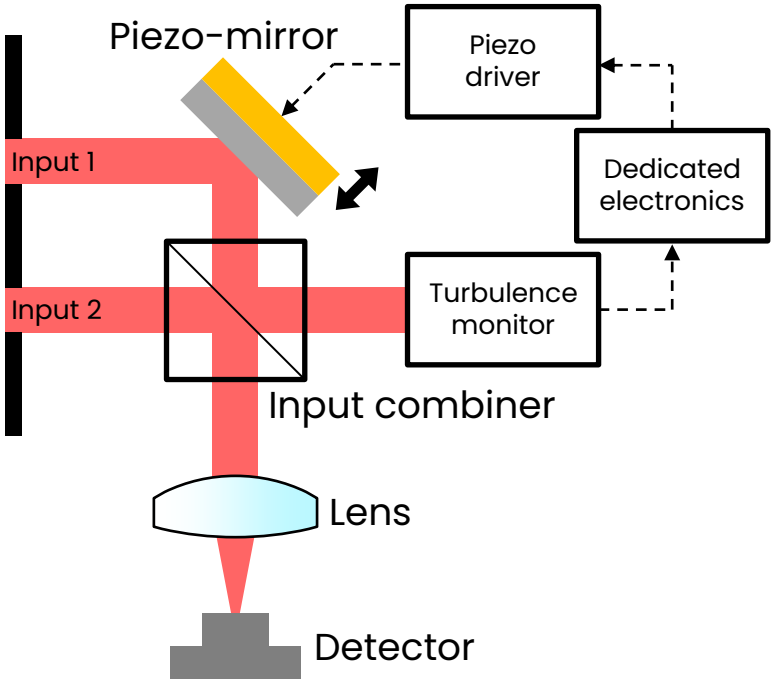
Total probability of receiving the correct vortex vs turbulence strength

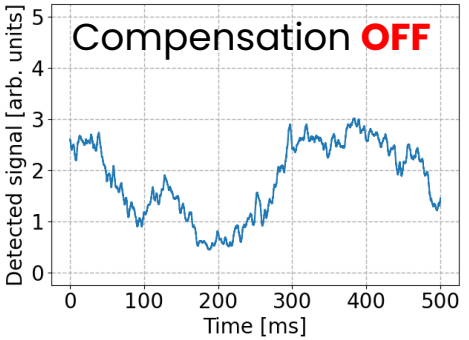


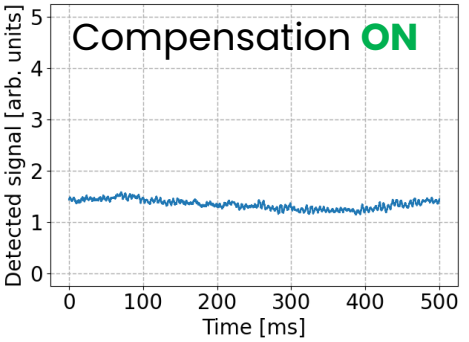
Probability decay vs time under turbulence



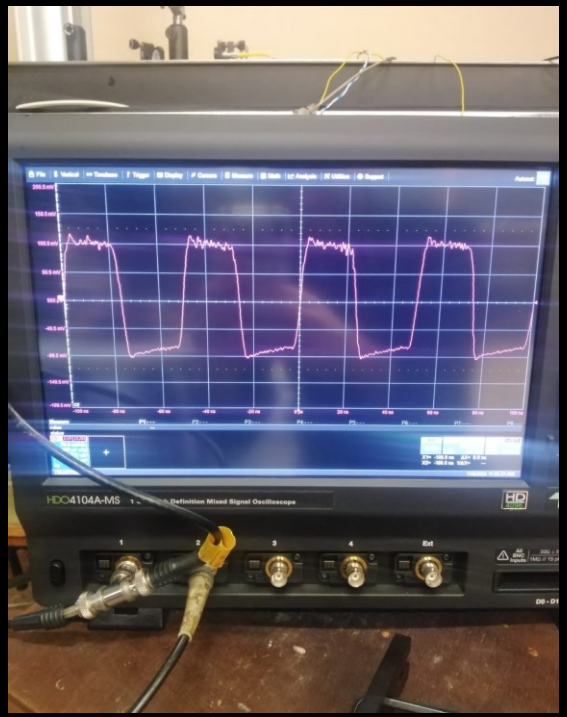
COMPENSATION of turbulence effects

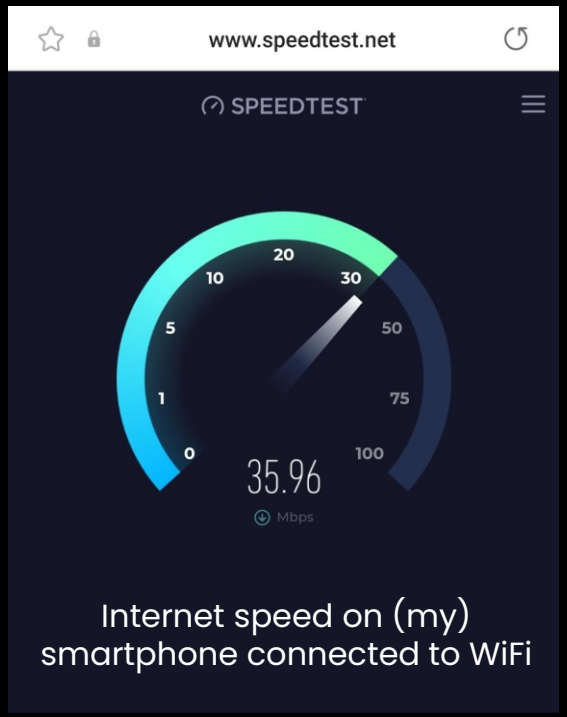






First **successful** tests of vortex-based optical communication over a **60-meter-long** optical link at **40 Mbit/s**





Internet speed on (my) smartphone connected to WiFi

INDUSTRIAL **partners**

Established partnerships and contacts to leverage **Gbit/s space-based** communications

Atlas Advanced Technologies s.r.l.

optec S.p.A. OPTICAL & OPTOELECTRONIC SYSTEMS

D-ORBIT

SATENLIGHT

Multichannel Optical Communications

We enable optical multiplexing to overcome the limitations of current solutions, taking spatial communication to the next level

SatEnlight is a new start-up project included in Galaxia portfolio, **funded by CDP** Venture Capital SGR in partnership with **Obloo**

https://satenlight.com
https://www.linkedin.com/company/satenlight

BEYOND MUSA

LA STATALE news

Innovazione e ricerca

Internet nello spazio sempre più vicino grazie a una tecnologia sviluppata in Statale

L'innovativa tecnologia è stata sviluppata e brevettata nel Laboratorio di Strumentazione ottica del dipartimento di Fisica "Aldo Pontremoli".

UNIVERSITÀ DEGLI STUDI DI MILANO

Project INSPIRED, call FISA funded by MUR

4 million EUR funded by MUR

4 years project

10 aggregated Gbit/s per orbiting unit

Supporting Social Economy's digital transition: evidence from the Italian context

MULTILAYERED URBAN SUSTAINABILITY ACTION_SPOKE 4

9 dicembre 2024

Presentazione preliminare dei dati derivanti dall'indagine sull'uso dell'innovazione tecnologica nelle imprese sociali italiane

Federico Bartolomucci

Assistant Professors del Politecnico di Milano

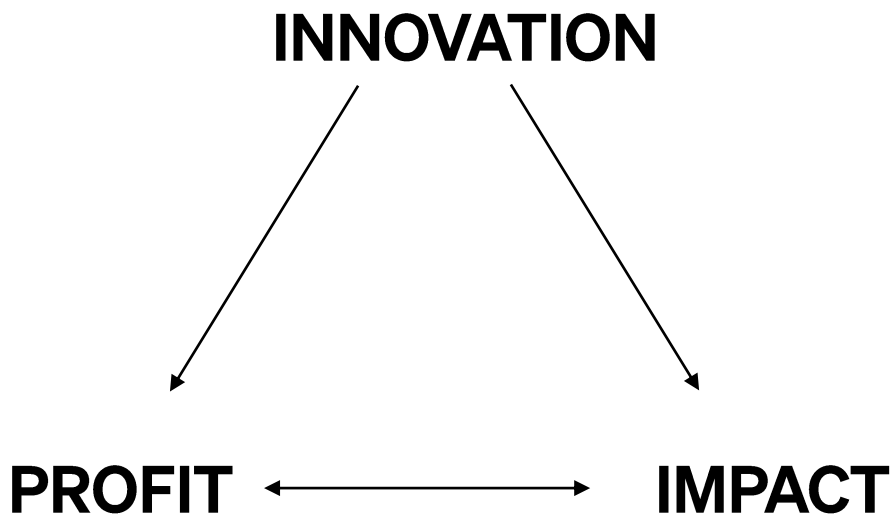
▶ BACKGROUND

OLTRE LA DICOTOMIA PROFITTO-IMPATTO

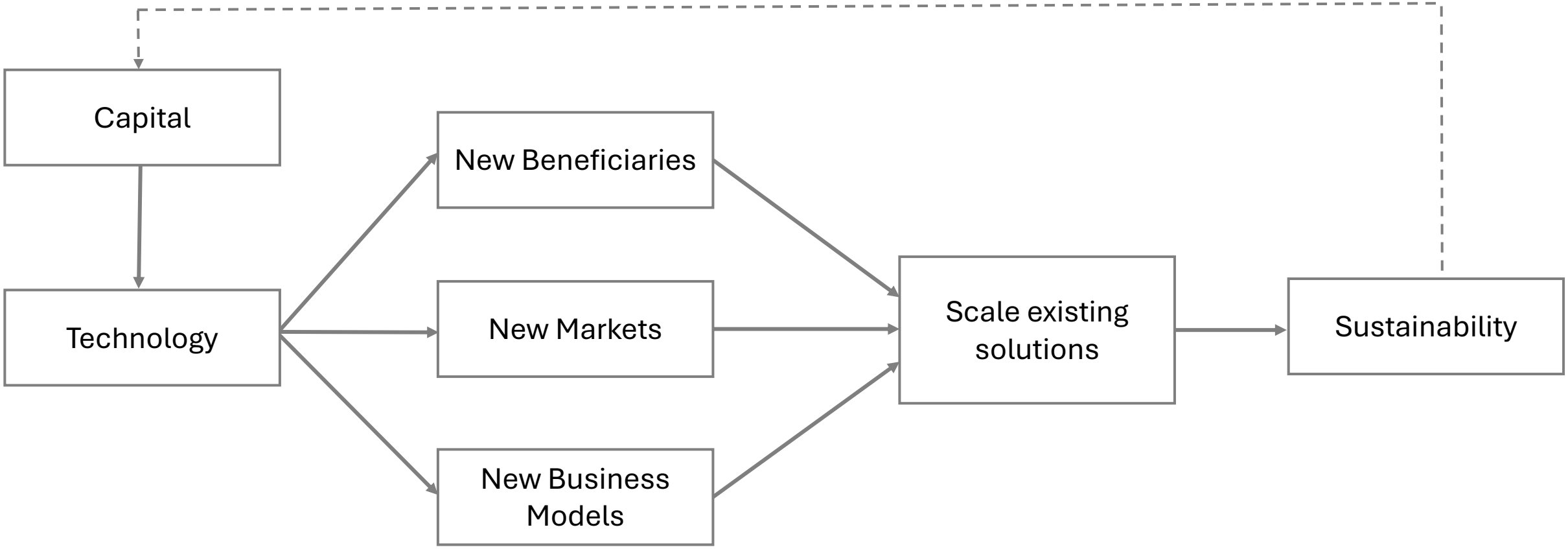
The old paradigm

PROFIT VS IMPACT

The new paradigm



TECNOLOGIA. FINANZA. IMPRESE SOCIALI.



METODOLOGIA

- Popolazion target: *imprese sociali registrate nel Runts-Registro Nazionale Terzo Settore*

- Contenuto del questionario

- *Anagrafica*
- *Uso della tecnologia*
- *Fabbisogno finanziario e tecnologia*
- *Finanza ad impatto*

- Tasso di risposta: *993 risposte*

RISULTATI

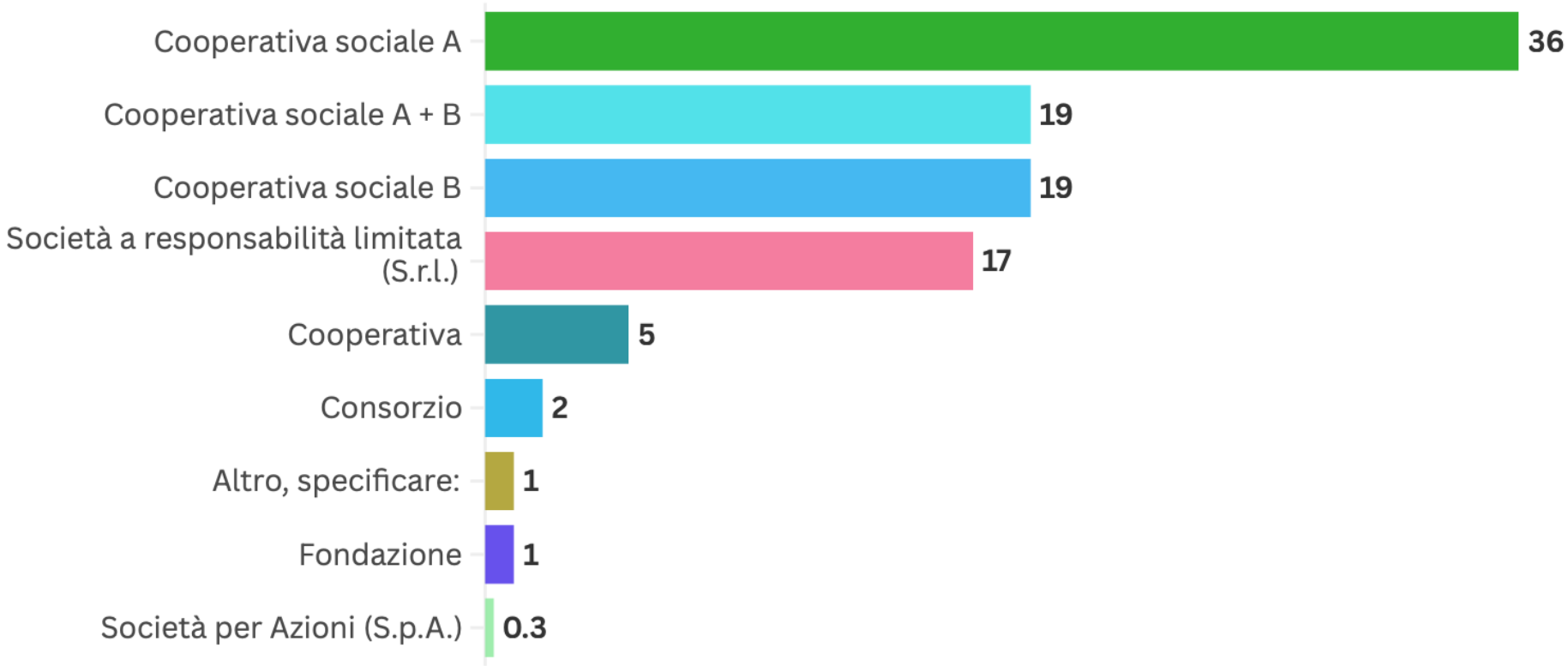
- ANAGRAFICA
- TECNOLOGIA
- FINANZA

ANAGRAFICA

1

ANAGRAFICA

1.1 Forma legale (%)



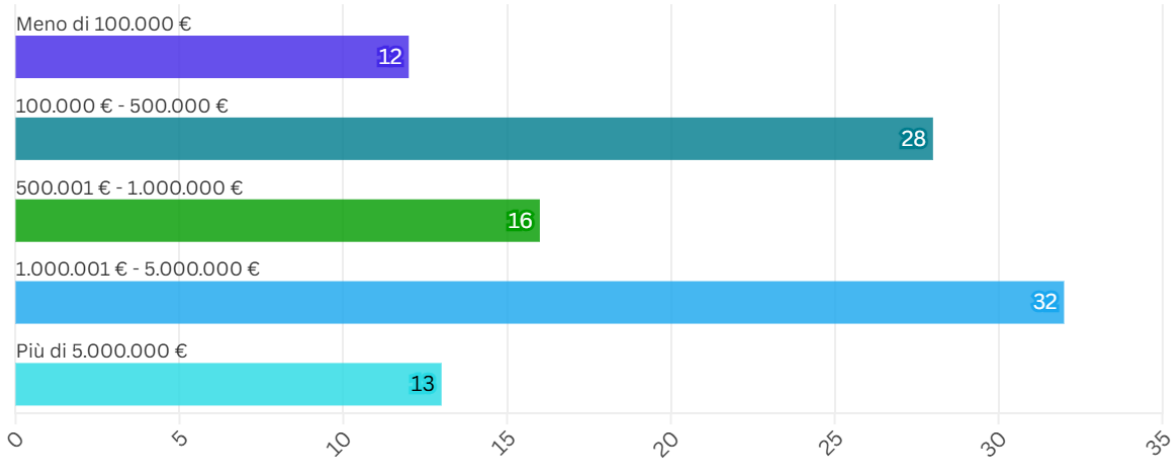
In linea con la natura delle imprese sociali in Italia, la maggior parte dei rispondenti afferisce alla forma legale delle cooperative sociali.

1

ANAGRAFICA

1.2 Dimensione

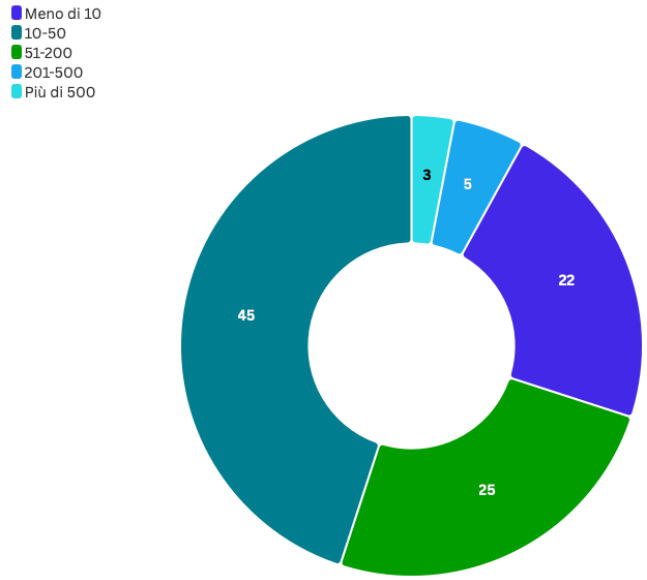
1.2.1 Fatturato (%)



Dai risultati emergono due fasce di fatturato principale che insieme cubano il 60% del campione.

1.2.2 Dipendenti (%)

All'incirca un quarto dei rispondenti è costituito da micro imprese con meno di 10 dipendenti. Oltre il 45% dei rispondenti è tra i 10 e i 50 dipendenti, mentre un altro 25% si attesta tra i 50 e i 200.

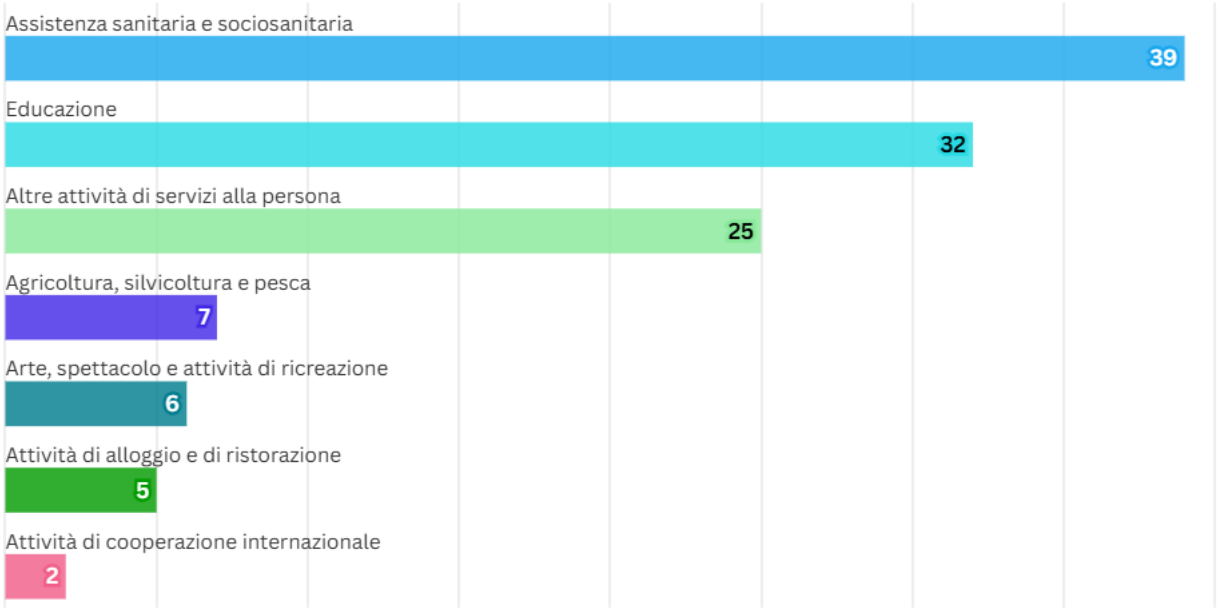


1

ANAGRAFICA

1.3 Area di intervento

1.3.1 Settore (%)



I dati rispecchiano la distribuzione settoriale delle imprese sociali in Italia, con oltre il 70% dei rispondenti operanti nel settore Socio-Assistenziale e Educativo.

1

ANAGRAFICA

1.3.1 Area geografica di intervento

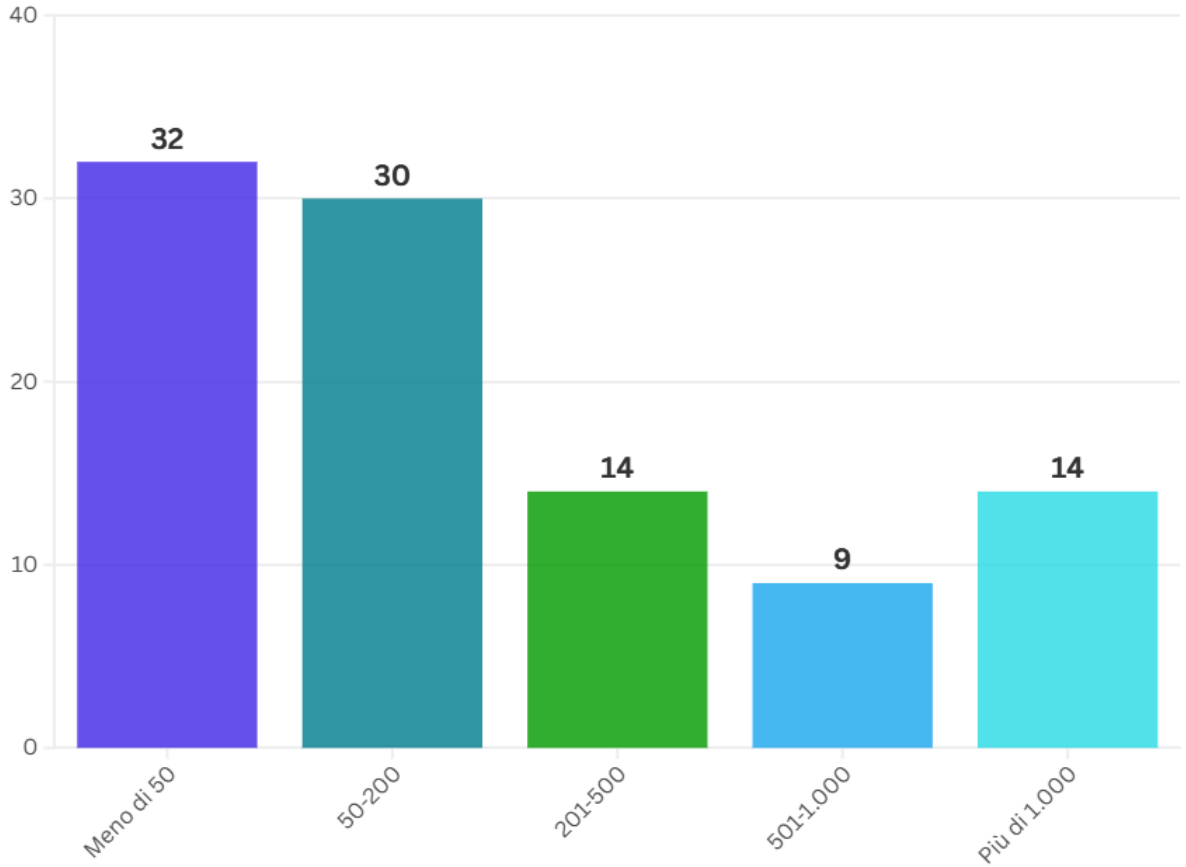
1.3.1 Geografia

· Lombardia	185	19,9%
· Veneto	80	8,6%
· Sicilia	70	7,5%
· Piemonte	68	7,3%
· Lazio	66	7,1%
· Emilia-Romagna	65	7,0%
· Puglia	64	6,9%
· Campania	62	6,7%
· Sardegna	59	6,4%
· Toscana	53	5,7%
· Trentino-Alto Adige	26	2,8%
· Marche	25	2,7%
· Liguria	21	2,3%
· Calabria	18	1,9%
· Friuli-Venezia Giulia	18	1,9%
· Umbria	14	1,5%
· Basilicata	13	1,4%
· Abruzzo	12	1,3%
· Molise	8	0,9%
· Valle d'Aosta	2	0,2%

1

ANAGRAFICA

1.4 Beneficiari (%)

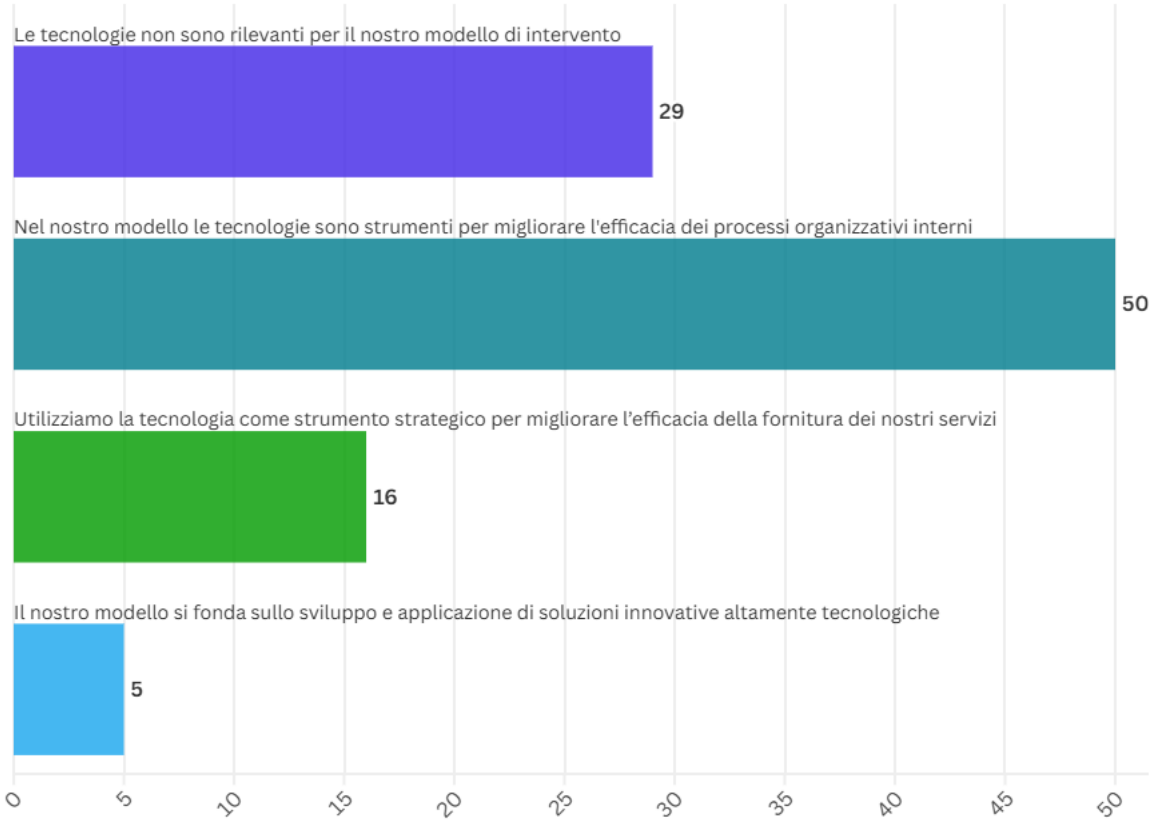


Il 30% dei rispondenti dichiara di avere meno di 50 beneficiari.
Il 14% dichiara di avere più di 100 beneficiari.

TECNOLOGIA

2 TECNOLOGIA

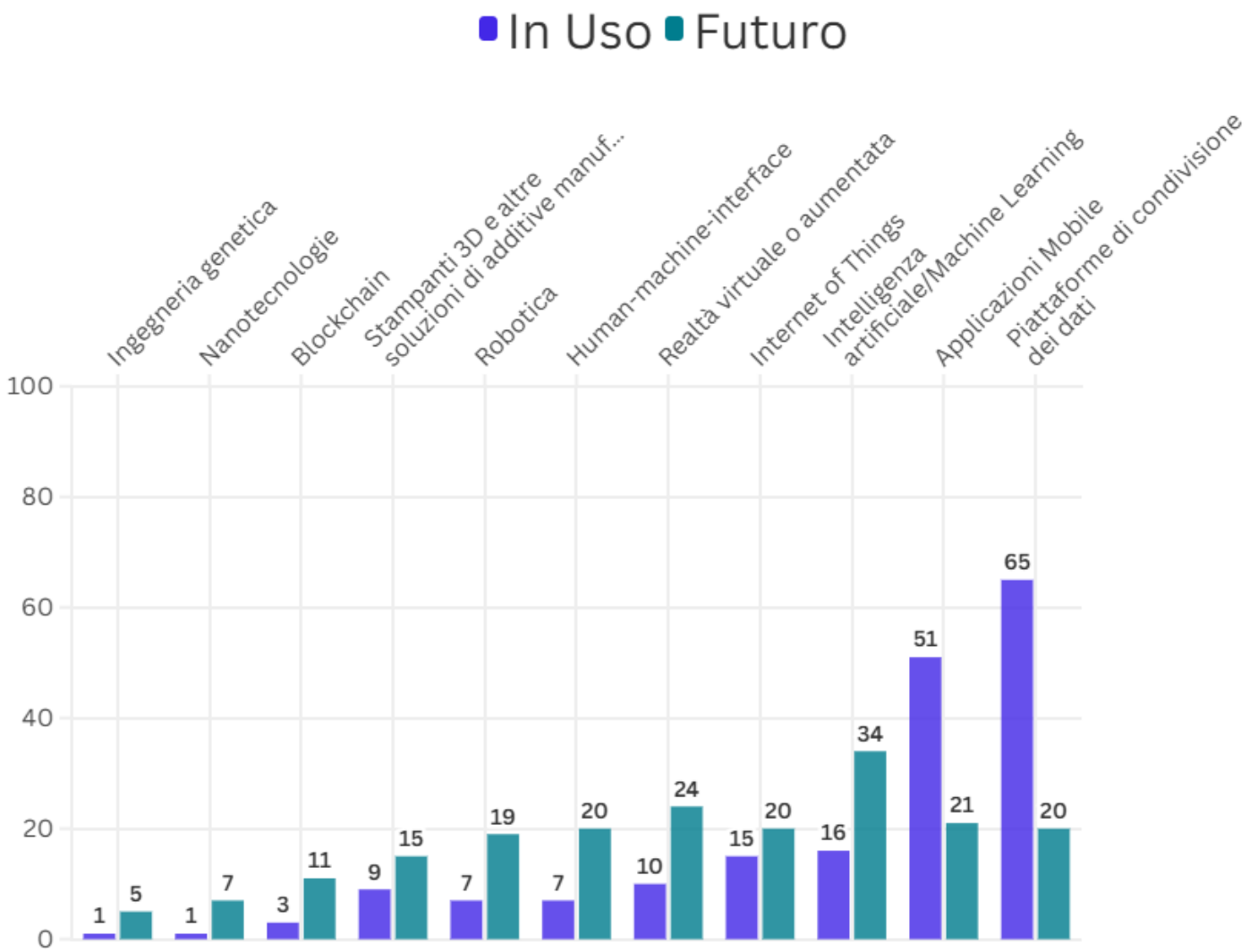
2.1 Ruolo della tecnologia (%)



Solo una minoranza composta dal 21% degli intervistati, considera le tecnologie uno strumento strategico per la propria attività di business. Solo il 5% basa il proprio modello di business sull'applicazione di tecnologie innovative.

2 TECNOLOGIA

2.2 Tipi di tecnologie utilizzate (%)

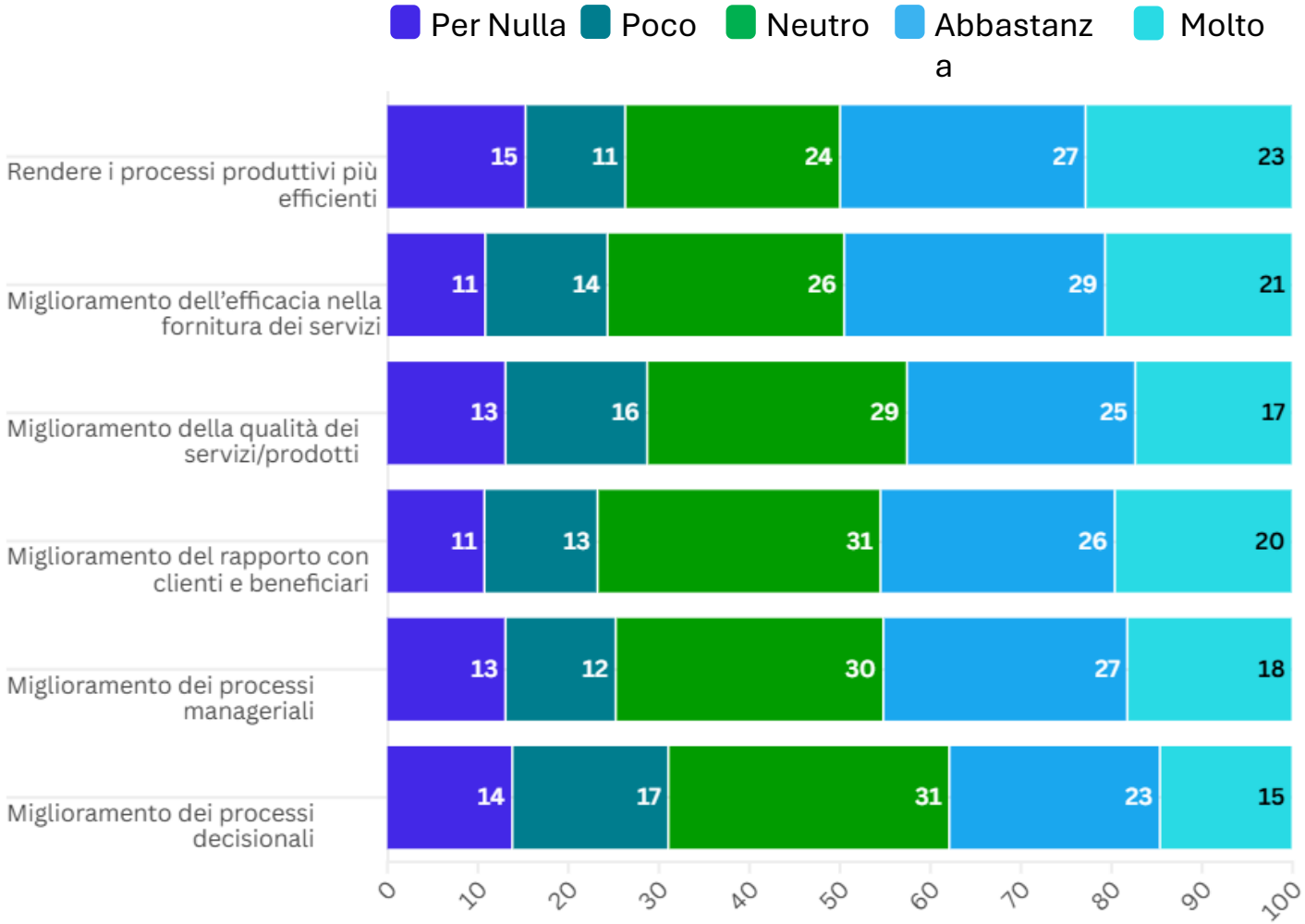


Sul totale del campione, le piattaforme di condivisione dei dati e le applicazioni mobile sono le tecnologie più utilizzate.

2

TECNOLOGIA

2.4 Benefici (%)

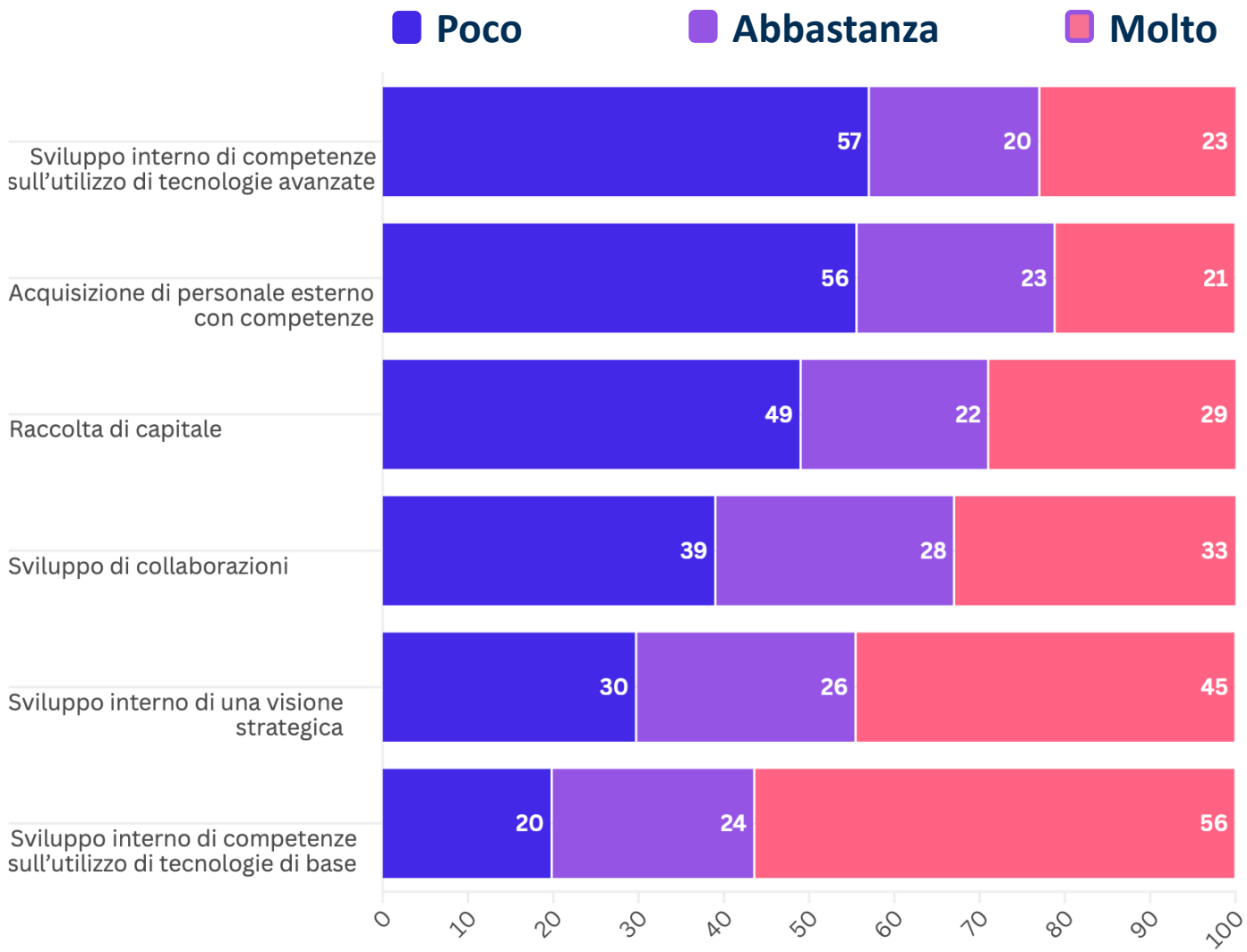


C'è un sostanziale allineamento tra i benefici derivanti dall'utilizzo delle tecnologie.

2

TECNOLOGIA

2.5 Ambiti di sviluppo (%)



Negli attori dell'economia sociale esiste ancora un bisogno molto sentito di formazione su tecnologie di base e sviluppo di una visione strategica sull'innovazione.

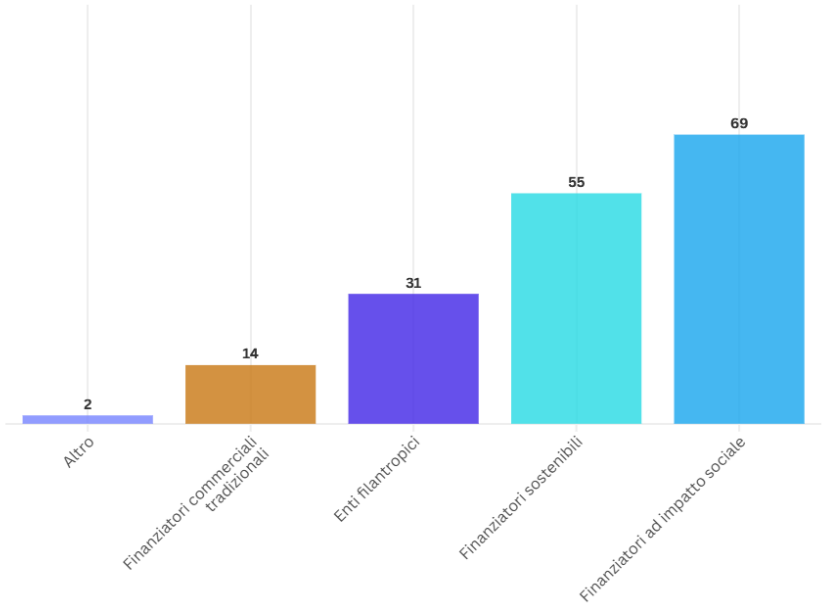
FINANZA

3

FINANZA

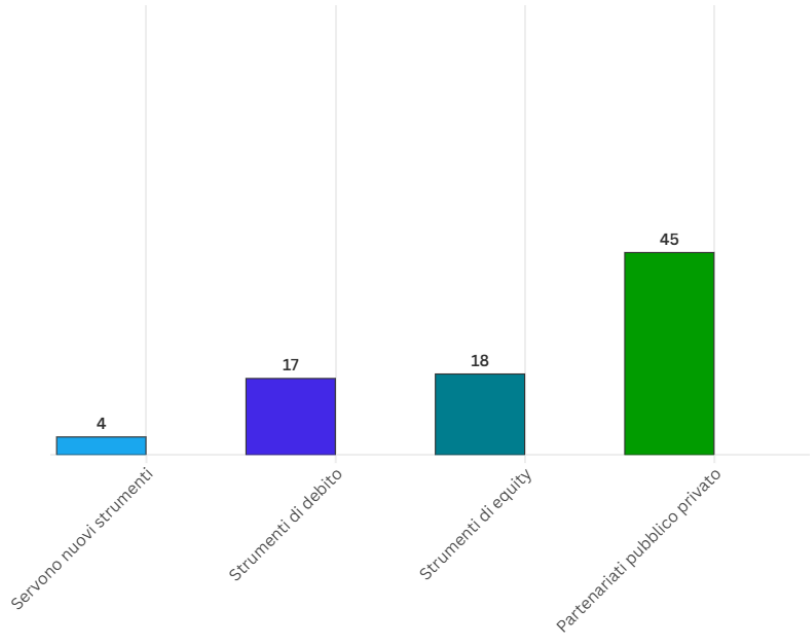
3.1 Operatori abilitatori

3.2 Strumenti abilitanti



Esista una grande aspettativa sul contributo che i finanziamenti ad impatto possono dare allo sviluppo tecnologico delle imprese sociali.

Tra gli strumenti di finanza ad impatto c'è grande aspettativa sul contributo abilitante dei partenariati pubblico-privato.

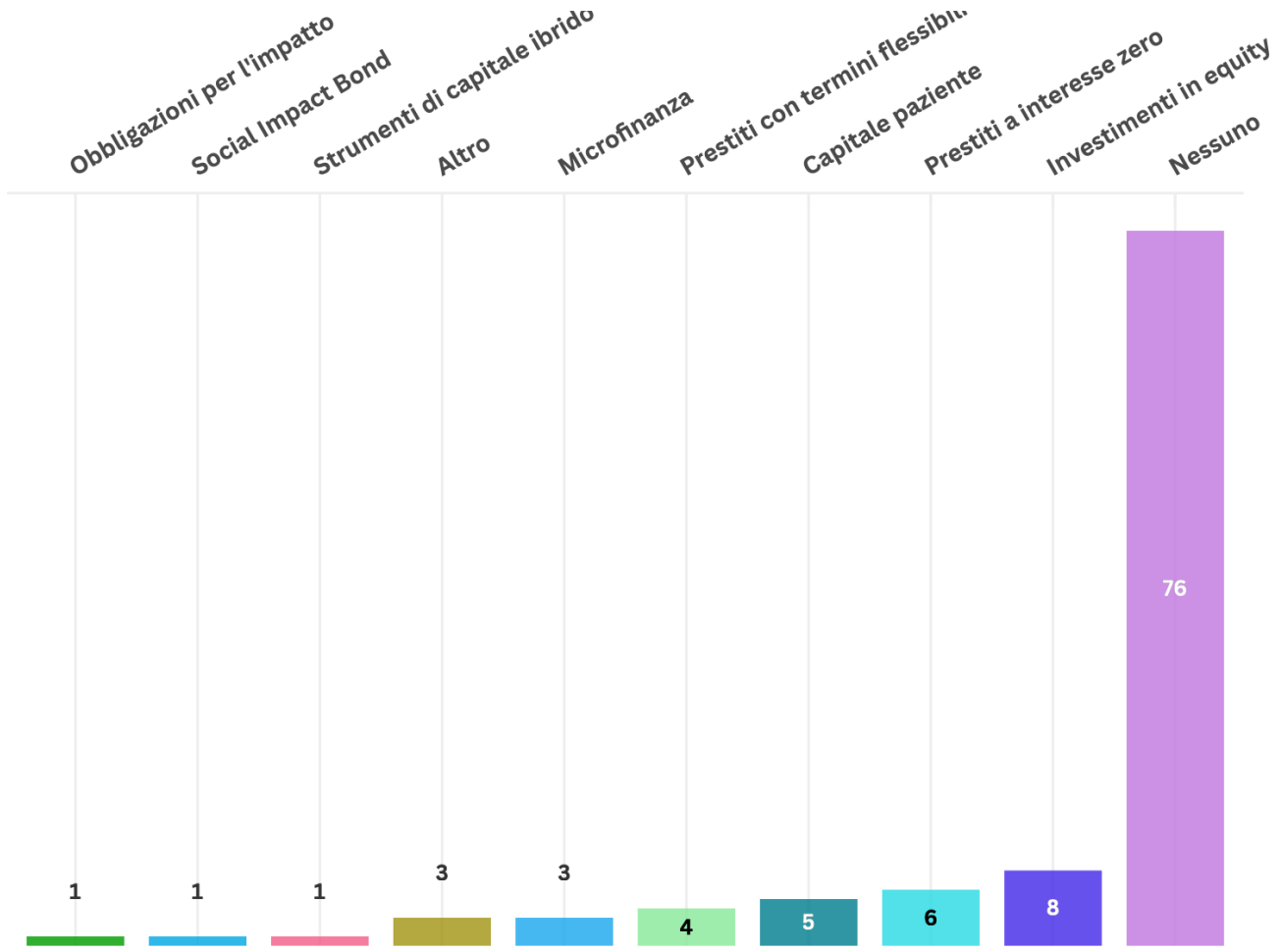


3

FINANZA

3.3 Finanza ad impatto (%)

3.3.1 Strumenti



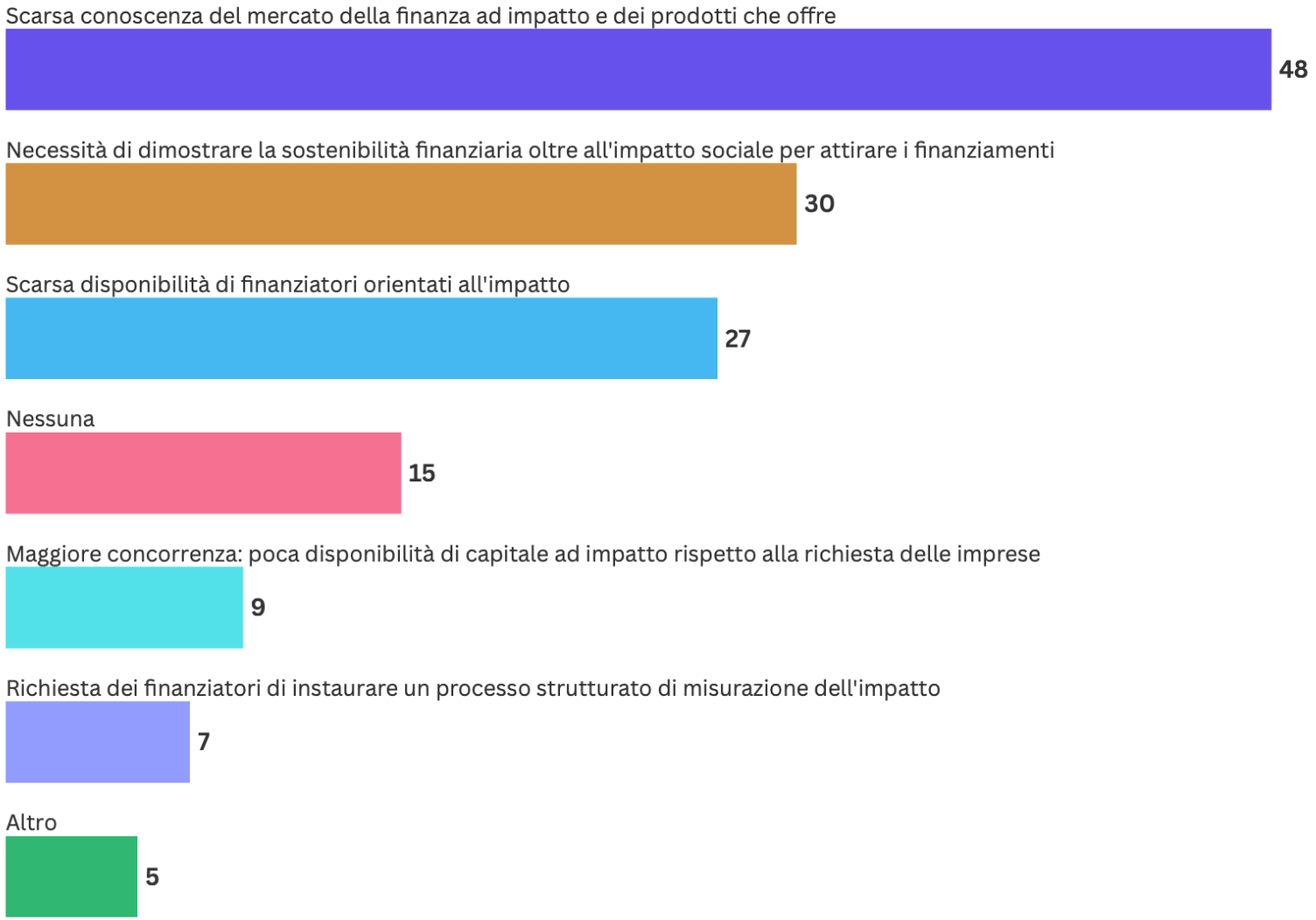
A discapito delle attese, l'utilizzo degli strumenti di finanza ad impatto è ancora molto basso, con il 76% degli attori che dichiara di non servirsene.

3

TECNOLOGIA & FINANZA

3.3 Finanza ad impatto (%)

3.3.2 Sfide



Le motivazioni sono da esplorare, ma è già evidente una mancanza di conoscenza e una difficoltà di dimostrare l'impatto generato.

HIGHLIGHTS

- **La tecnologia è principalmente un mezzo per efficientare i processi gestionali e organizzativi e ha poco a che fare con il modello di intervento.**
- **Le organizzazioni dimostrano una chiara volontà di approcciarsi all'uso di tecnologie più complesse.**
- **La finanza ad impatto è uno strumento attrattivo ma poco accessibile per le imprese sociali.**
- **Questo disallineamento è dovuto ad una mancanza di conoscenza delle opportunità e all'enfasi posta sulla performance economico-finanziaria.**

Finanziato dall'Unione europea NextGenerationEU
Ministero dell'Università e della Ricerca
Italiadomani PIANO NAZIONALE DI RIPRESA E RESILIENZA
MUSA

EFFE Summer Camp

Achievement and future perspectives

Rinaldi E., Cucchiarini V., dalla Pellegrina L., Sguotti M., Bertagnoli E.

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- June 10-15, 2024 at the University of Milano-Bicocca
- 60 young women (2006-2007-2008)
- The first free financial and entrepreneurial summer camp aimed exclusively at teenage women.

Università degli Studi di Milano Bicocca
Di.SEA.DE
Dipartimento di Scienze Economico-Aziendali e Diritto per l'Economia

EFE Summer Camp
Campo estivo di educazione finanziaria e all'imprenditorialità per ragazze adolescenti

Obiettivo EFE
Empowerment Femminile per un Futuro più Equo

Partners

aeee Founded in 1990
ONEEF Osservatorio Nazionale di Educazione Economico Finanziaria
CISEPS
Comitato Unico di Garanzia Università di Milano-Bicocca
GRUPPO CREDEM
aref
Ania Forum Ania Consumatori
bip
Brescianini
M.D.C. 45° 1976-2021
MUSA
RS
UniCredit
Crédit Agricole
Deutsche Bank
FEduF
Heritage House
JA Italia
Rekordata Authorised Education Specialist
Associazione dei Docenti di Economia degli Intermediari e dei Mercati Finanziari
API
AIDDA ETS
Confimi Industria Bergamo
Confimi Industria Monza Brianza
FERPI
Fidapa BPW Italy Monza e Brianza
Inner Wheel Italia
Soroptimist International d'Italia
WOMEN&TECH ETS

EFFE Summer Camp goals

01.

Raise the financial skills level.

02.

Increase entrepreneurial skills.

03.

Increase interest in the study of finance and economics.

Financial Literacy

A combination of financial awareness, knowledge, skills, attitudes and behaviors necessary to make wise financial decisions and achieve individual financial well-being (OECD, 2024).

3 components: Knowledge, Behaviour, Attitudes

- Italy has a score of 10.7 out of 20 points, below the European average. (Banca d'Italia, 2023)
- Italians believe they know more than they really know
- Gender gap: Italian women have a significantly lower level of financial literacy than men. This is the case in many nations, but it is particularly true in Italy.
- Gender differences are already present among the very young. According to INVALSI-OECD PISA 2024 surveys, a 15-year-old girl already has a significantly lower level of knowledge than her male peer.

Entrepreneurial competence

It refers to the ability to act on ideas and opportunities and turn them into values for others. It is based on creativity, critical thinking and problem solving, initiative and perseverance, and the ability to work collaboratively in order to plan and manage projects that have cultural, social or financial value (European council, 2018)

It results from a variety of factors (aspects of personality and behavior)

- Despite the recovery in recent years, Italy remains among the countries with the lowest entrepreneurial propensity (GEM, 2023-2024)
- The gender gap is particularly significant and is higher in our country than the average for highly developed countries
- Research has identified social, cultural, infrastructural, educational, labor, and aspects related to women's role in society as barriers or facilitators to women's entrepreneurship (e.g., Bullough et al., 2017; Welter & Smallbone, 2010).
- A greater commitment to entrepreneurship education in schools is also crucial in this area.

EFFE summer camp: **contents**

It combines theoretical lectures, case studies, first-hand accounts from female entrepreneurs, practical exercises, and more, to impart financial and entrepreneurial skills effectively.

The camp combines experts from the world of education and research with those directly involved in business, offering many insights and different points of view to the girls who attend.

Monitoring

Qualitative and quantitative, based on the OECD recommendations for financial education programs

Qualitative research

interviews with camp teachers

Interviews and focus groups with PCTO supervisors of participating students

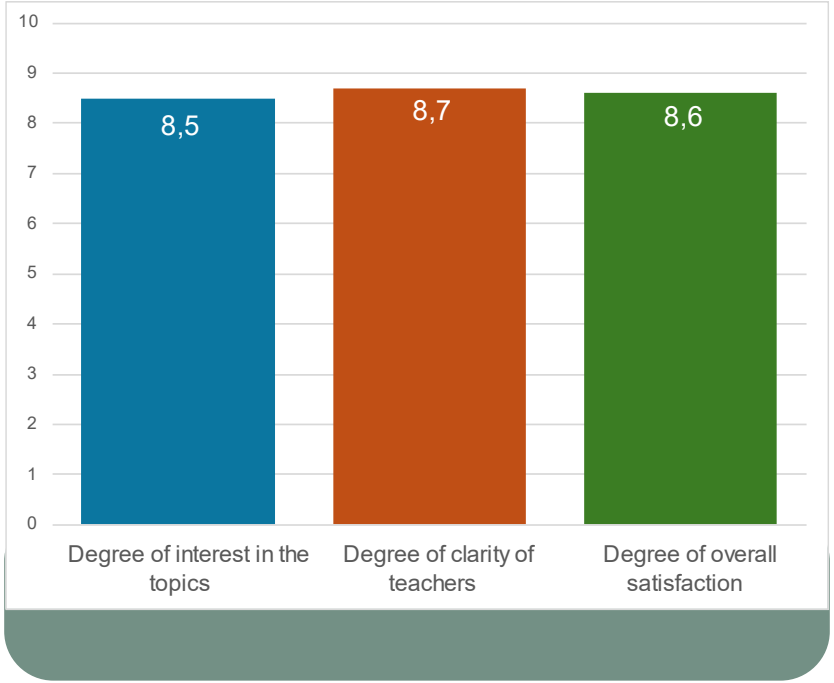
Box with anonymous notes at the end of the camp: positive aspects, negative aspects

Quantitative research

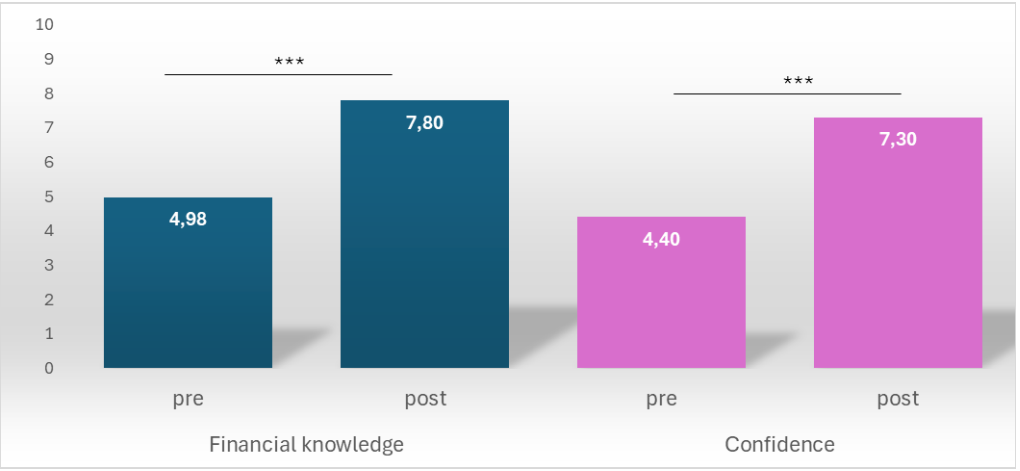
Camp enjoyment: anonymous paper questionnaire, distributed daily to all participants, with forms on each teacher of the day

Assessment on learning: Survey pre and post-camp

Degree of satisfaction



Financial knowledge



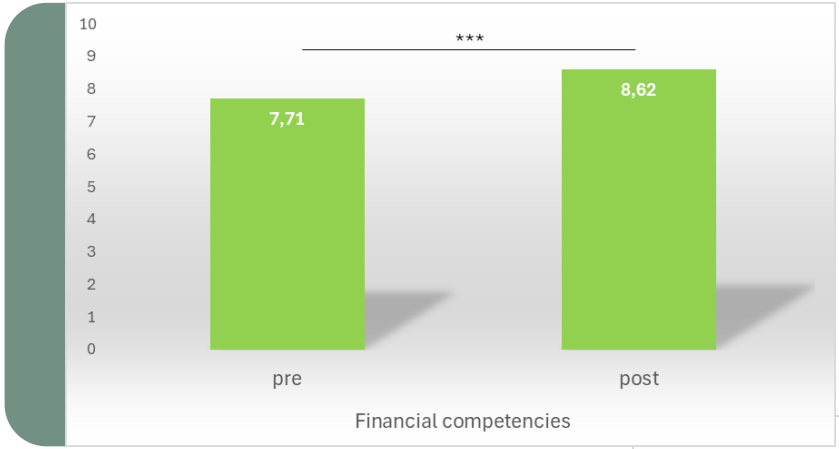
10 questions:

- understanding the value of money over time, concept of inflation
- calculation of simple and compound interest
- concepts of risk, return, diversification
- knowledge of financial terms (e.g., TAEG) and banking products (e.g., PAC)
- awareness of one's own performance.

These are key concepts also captured in the OECD/INFE 2020 questionnaire on financial literacy of adults internationally.

	Has a sum of money for her own expenses (e.g., pocket money)	n	Financial knowledge
PRE	Yes	47	5,03
	No	5	3,25
POST	Yes	44	7,81
	No	5	7,50

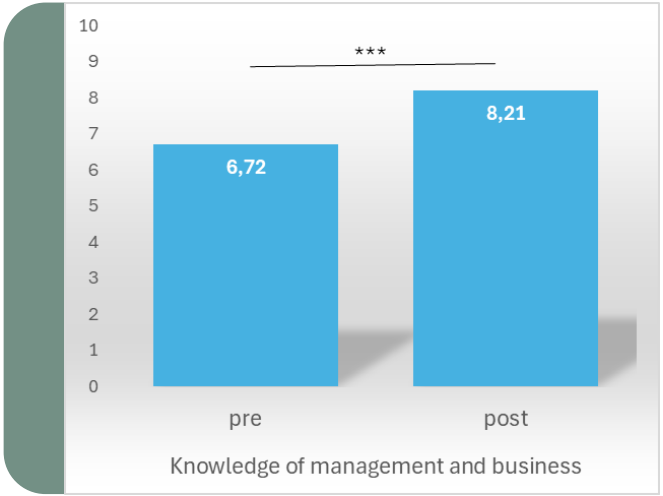
Financial competencies



10 questions:

- ability to reason about everyday financial situations
- Awareness of the benefits and risks in business, including online security
- Knowledge of factors that influence the cost of goods and services, such as insurance

Knowledge of management and business



6 questions:

- What is the most commonly accepted definition of "start-up"?
- Speaking of enterprise, an "elevator pitch" refers to a presentation of the company that...
- What is the definition of a budget forecast?
- What is the definition of a business plan?
- The business budget of a company consists of...
- The term "design thinking" refers to...

EFFE summer camp: **Future perspectives**

- insert a module on "debate"
- in-depth study of the theme "sustainability“
- propose an edition of EFFE Summer Camp in southern Italy
- boost on empirical assessment

EFFE Summer Camp is a project that aims to involve more and more girls in financial education summer camps throughout Italy for at least the next 10 years. If **you are interested** in participating in our projects as a **partner, sponsor or donor**, please get in touch with us at obiettivof@unimib.it

Thanks for your attention!

Missione 4 Istruzione e Ricerca

MUSA

MULTILAYERED URBAN SUSTAINABILITY ACTION

MUSA

MULTILAYERED URBAN SUSTAINABILITY ACTION

Ecosistema dell'Innovazione

TASK 1.1.3 SPOKE 6 UNIMIB

Festival GenerAzioni

General Meeting

9.12.2024

What is Festival GenerAzioni?

- Festival GenerAzioni is more than an event: it is an OPPORTUNITY
- It brings youth, academia, public institutions, and third-sector organizations **together** each year
- GenerAzioni responds to the pressing need for spaces where young people can connect directly with researchers and explore research in a way that's relevant to their lives
- It's about moving research into the heart of community dialogue, making it accessible, engaging, and impactful for all ages

B-YOUth Forum Partnership: a model to democratise knowledge creation

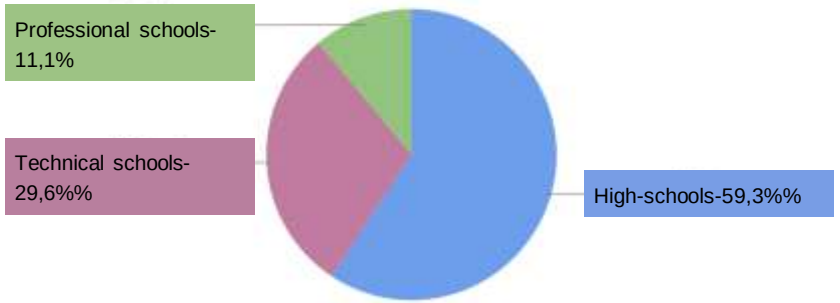
- A cornerstone of Festival GenerAzioni is its partnership with the B-YOUth Forum (task. 2.1.1.1 Spoke 6)
- B-YOUth Forum is a project dedicated to young people aged between 14 and 25, connecting secondary schools and educational services with university research.
- B-YOUth staff consisting of PhD students, researchers, trainees and a specially recruited educational facilitator accompany the young people in their encounter with research in the classroom or at the university.
- GenerAzioni becomes the event in which B-YOUth Forum's participants become facilitators towards their peers of the encounter with researchers and research

B-YOUth Forum Partnership: Figures

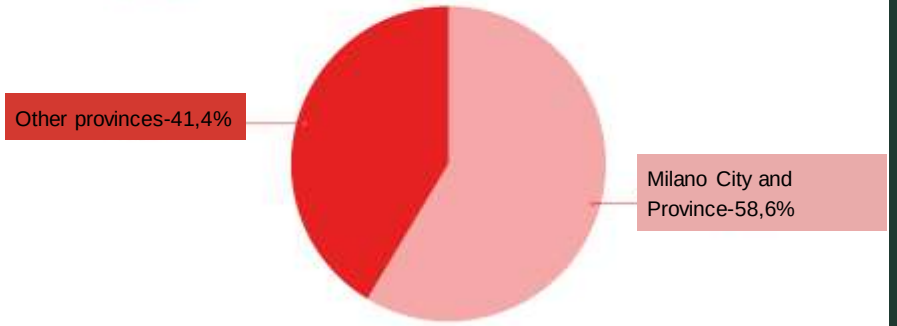
Through this model, B-YOUth Forum and Festival GenerAzioni have engaged over 3,000 young participants and about 30 high schools and 4 educational services, creating a rich peer-learning environment where knowledge is shared horizontally.

This peer-mentoring structure allows young people to facilitate discussions with their classmates, creating a ripple effect that extends the reach and impact of each event.

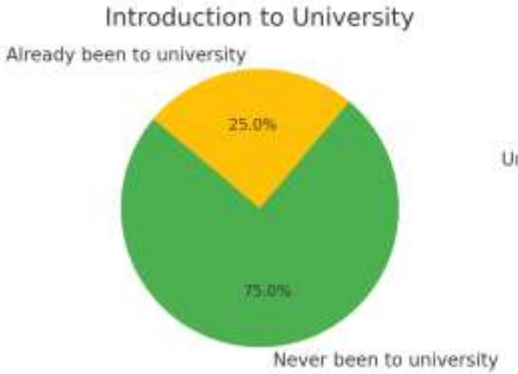
Types of involved secondary schools (2021-2024)

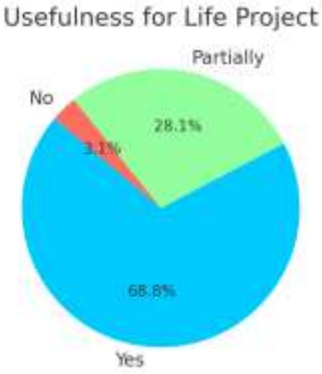


Location of the involved schools (2021-2024)



B-YOUth Forum Partnership: Figures





- Introduction to University: Shows that 75% of participants had never been to university before joining the B-YOUth program.
- Research and Citizenship Competences: Displays the development of various competences, with "Data analysis" and "Gathering information" as the most developed.
- Usefulness for Life Project: Reflects the perceived value of the program, with 68.8% of participants considering it beneficial for their personal and professional goals.

B-YOUth Forum is a strategy that offers junior researchers opportunities to engage with the younger generations

While Europe endorses numerous projects through funding that opens up valuable opportunities for research and innovation, it also requires that these projects have a concrete and measurable impact on society.

This makes effective dissemination work essential, through which research results can also reach and actively involve younger segments of the population, such as adolescents.

However, meaningfully engaging this audience is often a complex challenge, especially for smaller research groups or young researchers.

In this sense, B-YOUth with GenerAzioni offers a suitable space to also put ***PhD students, postdoctoral fellows*** **and** *junior researchers* in contact with teenagers and schools, undertaking a mediating and facilitating role

Stakeholders

- Fondazione EOS
- Cultural and Scientific Dissemination Entities - e.g. Fondazione Feltrinelli, A pint of Science
- Secondary Schools in Milan, Province, and Lombardy Region
- Educational Services, mainly from the 2nd and 9th Municipalities of Milan e.g. Cooperativa Diapason, Coop. Soc. Onlus Il tempo per l'infanzia

Global Context and SDG Alignment: A Model for Widening Participation

- Aligning with the United Nations Sustainable Development Goal 17, Festival GenerAzioni embodies the importance of partnership-driven action to achieve sustainable development. It recognizes that tackling society's global challenges requires input and action from diverse groups, **including the involvement of young people in research**.
- The concept of "widening participation" is central to the Festival's mission: it emphasizes the importance of expanding university engagement beyond academics to include varied stakeholders, making sustainable change a shared goal across the community.

Universities' Third Mission and Social Responsibility: Building a Bridge to Society

- By creating a mutual exchange of ideas and resources, the Festival positions the university as a **"natural incubator"** where scientific knowledge is shared with community members, **promoting shared growth and development**.

- Festival GenerAzioni and B-YOUth Forum offer a **rare blend of academic and community engagement**, where **young people gain hands-on exposure to research** and **university scholars, also the 'youngest ones'**, are offered an opportunity to **foster dissemination and public engagement competencies**

- B-YOUth Forum and Festival's partnership addresses local issues and aligns with global priorities, positioning itself as a **model for empowering young people and 'young' researchers**, **equipping them with the tools to address the challenges of sustainability for the future.**

JOIN US

https://festivalgenerazioni.unimib.it/

https://www.instagram.com/byouth.forum/

festival.generazioni@unimib.it

Festival GenerAzioni is realised within the MUSA – Multilayered Urban Sustainability Action – project, funded by the European Union – NextGenerationEU, under the National Recovery and Resilience Plan (NRRP) Mission 4 Component 2 Investment Line 1.5: Strengthening of research structures and creation of R&D “innovation ecosystems”, set up of “territorial leaders in R&D.

Thank you for your kind attention

MUSA Societies - Spoke 6

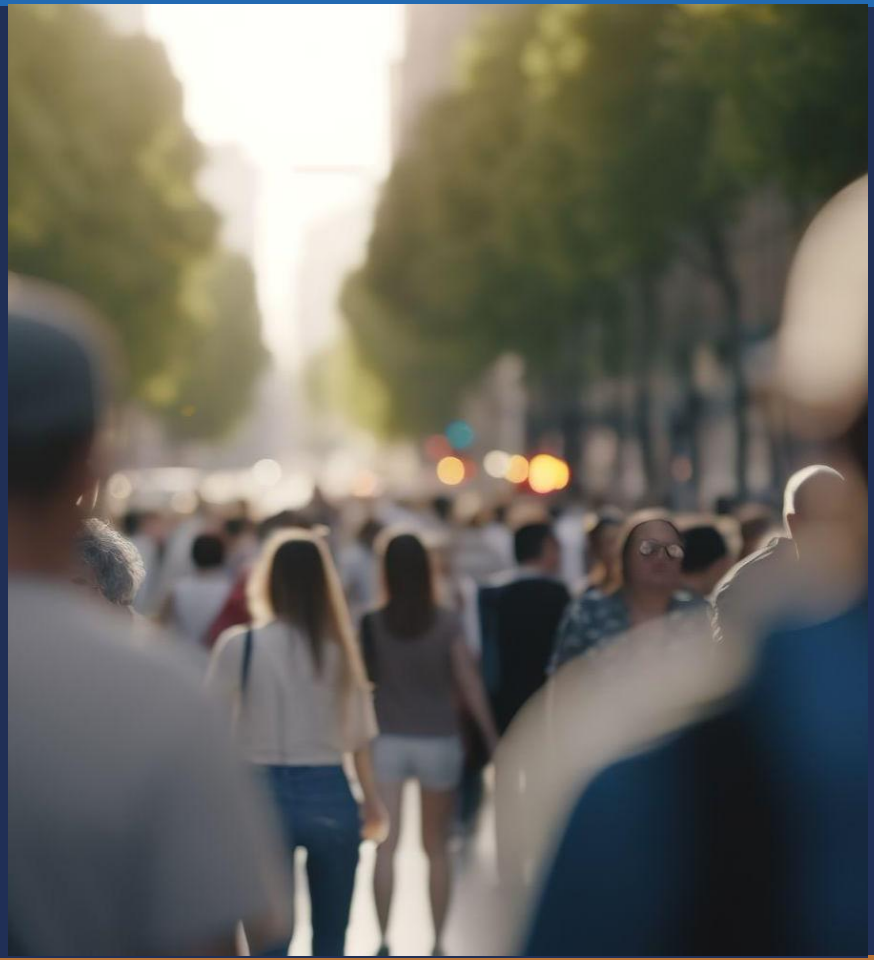
P.I.: Prof. Marilisa D'Amico
Prof. Matteo Turri

GLOSSARIO DELL'INCLUSIONE
The Glossary of Inclusion

Componenti del team di ricerca:
Maria Teresa Carinci
Maria Cristina Degoli
Paolo Ferrante
Michela Giudici
Francesca Marinelli
Giulia Menegon

Dal Progetto all'ecosistema
MUSA: Due anni di innovazione e sostenibilità urbana

9 dicembre 2024
Aula Magna – Università degli Studi di Milano



Perché un *Glossario dell'inclusione*?

per creare un ponte tra il mondo accademico e la società civile

› Esigenza:
veicolare concetti complessi in modo chiaro

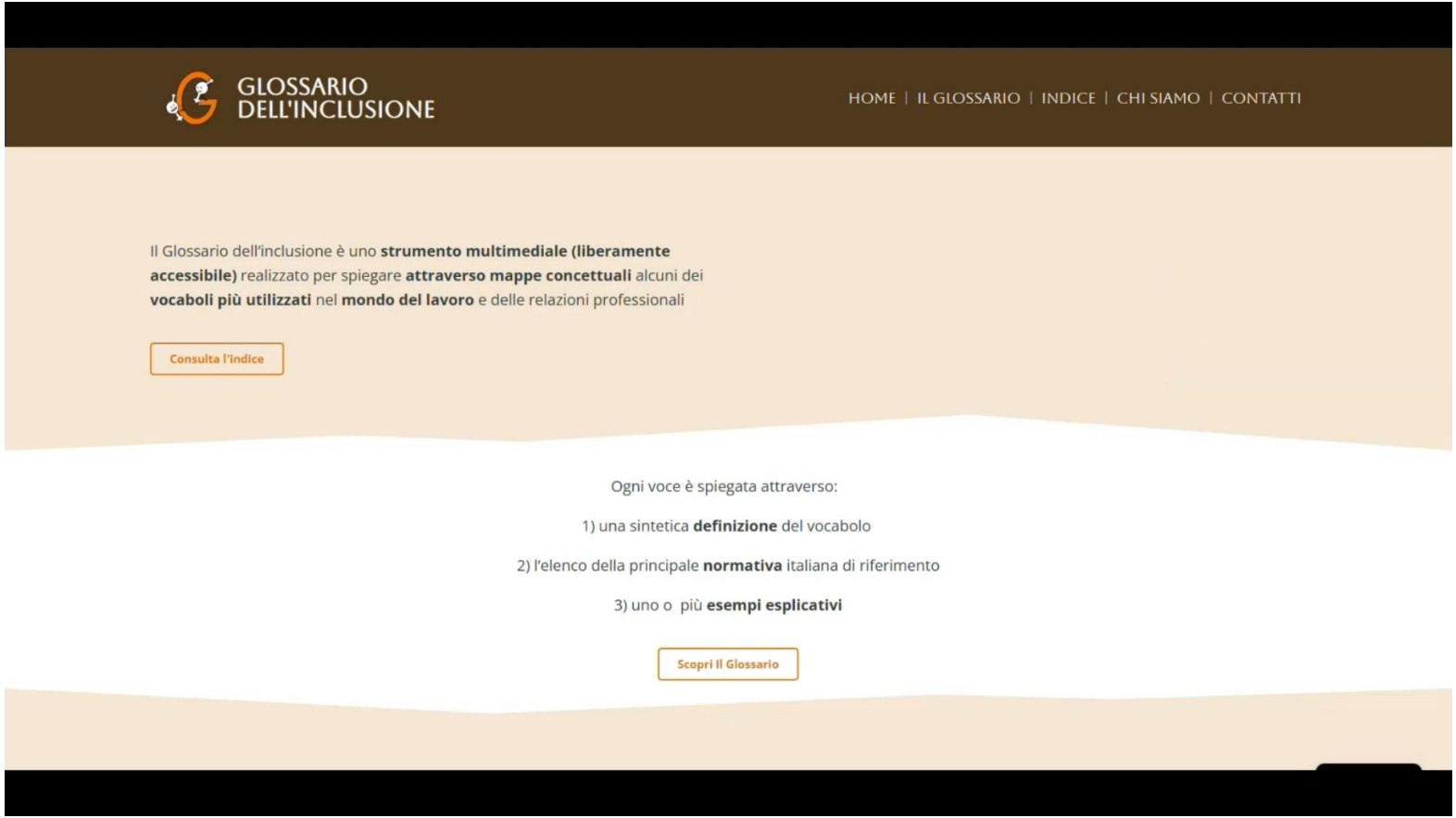
Metodologia di ricerca

Stile comunicativo semplice e innovativo

› Idea:
Utilizzo di mappe concettuali e figure

Progetto

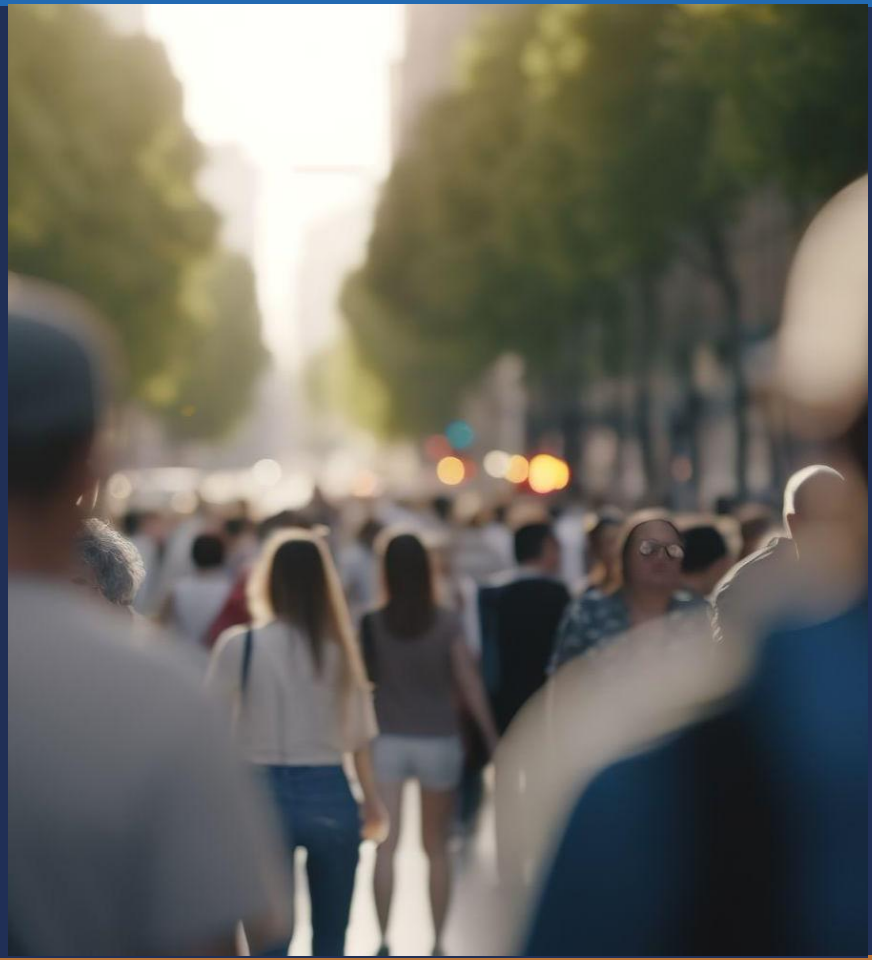
Strumento open-access per una divulgazione scientifica inclusiva


GLOSSARIO DELL'INCLUSIONE
HOME | IL GLOSSARIO | INDICE | CHI SIAMO | CONTATTI
Il Glossario dell'inclusione è uno **strumento multimediale (liberamente accessibile)** realizzato per spiegare **attraverso mappe concettuali** alcuni dei **vocaboli più utilizzati** nel **mondo del lavoro** e delle relazioni professionali
Consulta l'indice
Ogni voce è spiegata attraverso:
1) una sintetica **definizione** del vocabolo
2) l'elenco della principale **normativa** italiana di riferimento
3) uno o più **esempi esplicativi**
Scopri Il Glossario

MUSA **Societies** - Spoke 6

Grazie per l'attenzione!

glossarioinclusione.humanhall@unimi.it



Spoke 5 - WP2: T5.9-10

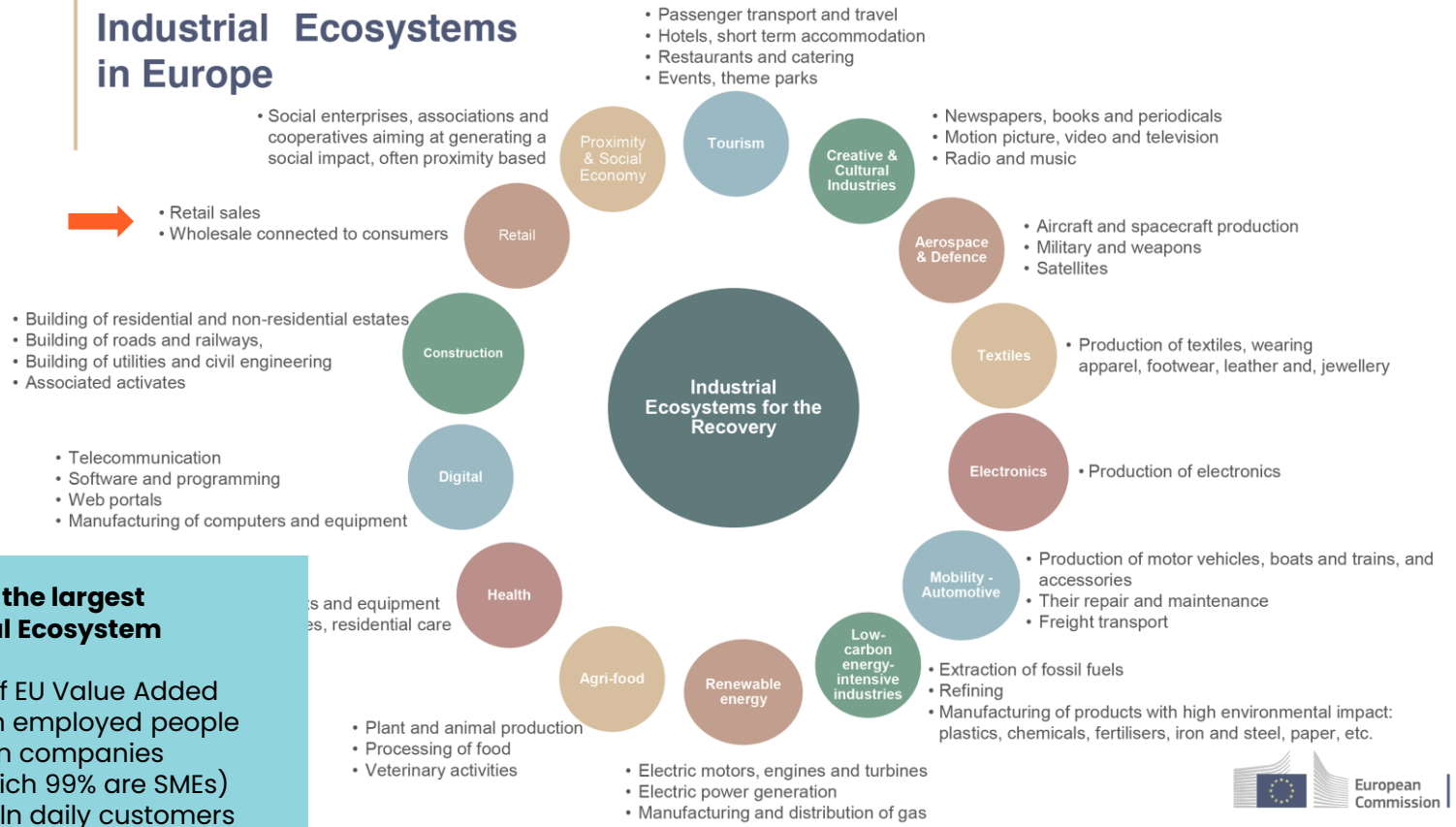
MUSA

Envisioning sustainable retail solutions: from theory to practice through design-driven activities

Politecnico di Milano, Dipartimento di Design
V. Iannilli, A. Spagnoli, T. Elli, F. Bonfim, C. Anceschi

Dec, 9th 2024

Industrial Ecosystems in Europe



Retail as the largest Industrial Ecosystem

- 11.5% of EU Value Added
- 30 mln employed people
- 5.5 mln companies (of which 99% are SMEs)
- 450 mln daily customers

MUSA Spoke 5 - WP2: T5.9-10

What role does retail play in the context of the sustainable transformation?

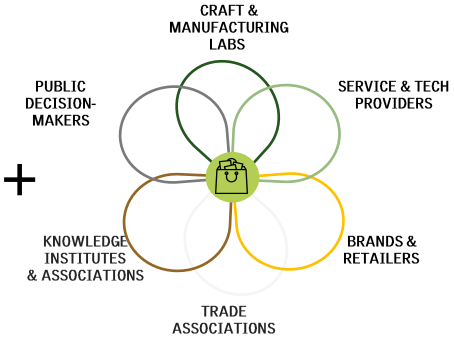
Context of the research

Innovative Consumption Models

+

Retail and Urban Context

+

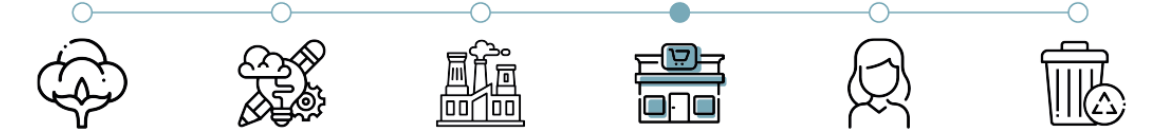


Actors and Decision-makers

=

Sustainable Retail Model

Innovative and Sustainable Design-driven Retail Models



Row Material
sourcing materials

Design
design & prototype

Production
assembly & finishing

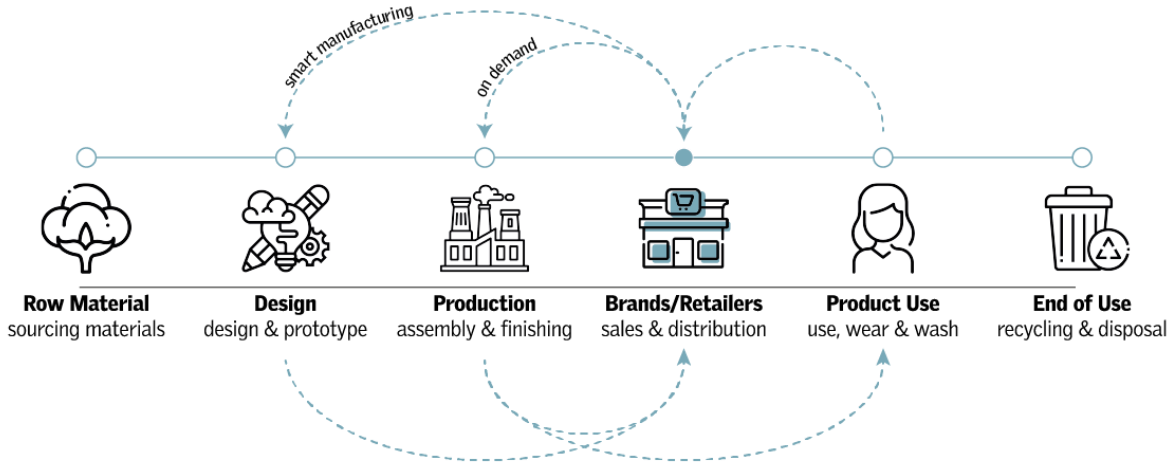
Brands/Retailers
sales & distribution

Product Use
use, wear & wash

End of Use
recycling & disposal

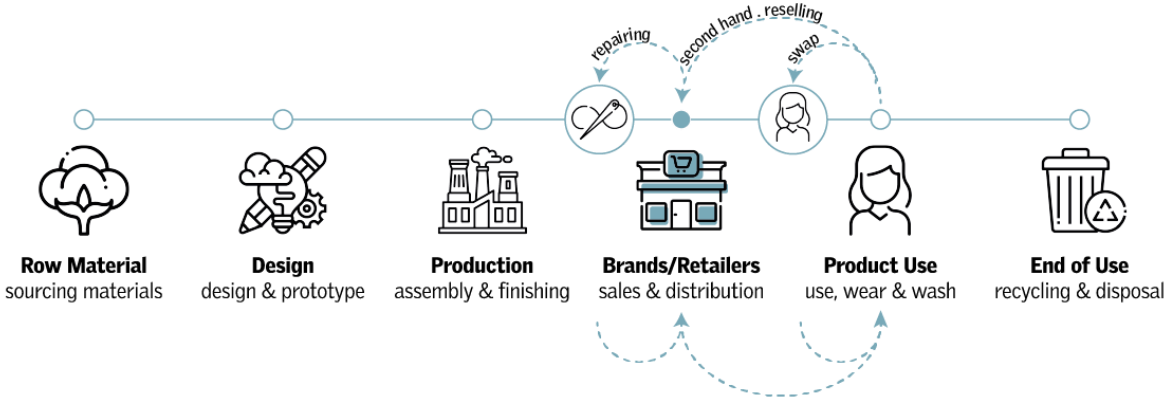
Innovative and Sustainable Design-driven Retail Models

REDUCE



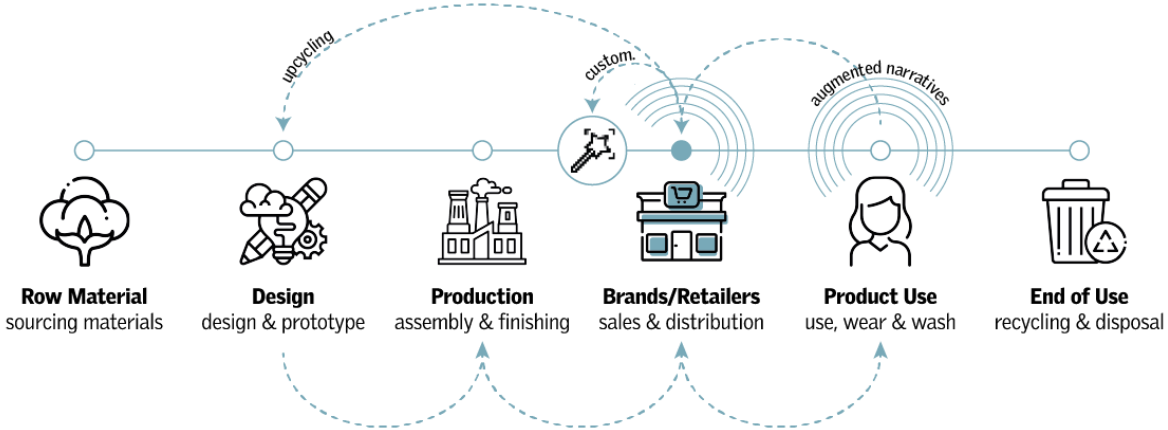
Innovative and Sustainable Design-driven Retail Models

REUSE



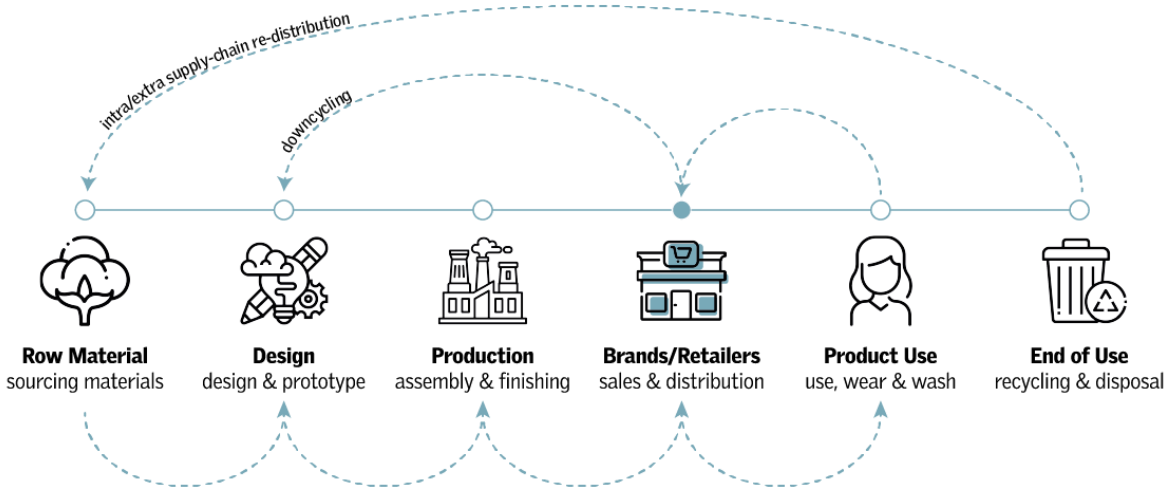
Innovative and Sustainable Design-driven Retail Models

RETHINK



Innovative and Sustainable Design-driven Retail Models

RECYCLE



Developing a model for sustainable retail

Developing a model for Sustainable Retail

Service Templates

Environmental Sustainability

89 solutions oriented to a fashion product or process that support retailers and customers in adopting behaviours oriented to a wiser usage of planet resources

Culture of Sustainability

53 services that support the adoption of more sustainable practices and that nurture awareness or behavioural change

Social Sustainability

16 social initiatives aimed at distributive justice that are directly or indirectly linked to fashion distribution and that can be initiated or supported by retailers.

Services for Environmental Sustainability

Solutions oriented to a fashion product or process that support retailers and customers in adopting behaviours oriented to a wiser usage of planet resources

Reduce

Services aimed at consuming fewer natural resources thanks to a reduction of manufacturing volumes.

Digital Fabrication
Production of tailored garments, or parts of them, thanks to machineries such as 3D printers, textile printers, laser cutters, 3D scanners and other numerical controlled machineries.

Traditional On-demand Production
On-demand production following traditional approaches (i.e., not a recognizable form of digital fabrication), including the creation of tailored products. As a result, many retailers realize reduced-inventory or zero-inventory stores.

Data-driven Retail
Brands that drive the store restock and the production of new items according to the analysis of selling data to prevent over-productions.

Collaborative Consumptions

Solutions that allow individuals and companies to share garments and accessories among multiple users and create occasions for more extensive exploitations of them.

Resale
Services that give garments a new life in the second-hand market or that recover and resell unsold fabrics.

Renting
Services that allow to use garments under the payment of a fee, requiring no property transfer (i.e., no sale/purchase).

Free Transaction Consumptions
Examples for transferring the ownership or borrowing fashion products without entailing a form of payment. The most well-known example is the practice of swapping.

Maintenance (Caring)

Services that prolong life of garments through caring actions and the monitoring of products status and usage.

Repairing
Services for fixing a product or replacing a broken part.

Refurbishing
Services aimed at restoring the original factory condition of fashion products

Digital Organizers
Digital services that allow customers to digitize their garments, monitor their usage, compose looks, and develop a better awareness towards their wardrobes.

Rethink

Services for prolonging the life of garments or their materials via their modification or transformation.

Upcycling
Services aimed at adding value to old or used products performing creative activities that include adding new functions, redesigning, or creating a new item from materials of discarded products.

Creative Mending
Services that, according to customer's needs, fix, adjust or decorate products using different techniques like patching, mending, embroidery, pearling, etc. Products don't acquire new functions.

Recycle

Services that allows the recovering of materials from collected and sorted end-of-life objects. The process can consume large amounts of energy and produce toxic waste.

Collection
Logistic services that use collection points, interactive bins, and reward strategies for gathering discarded products and direct them to a sorting circuit.

Sorting
Services for distinguishing products according to their current state, typology, or material. Processes can be manual or automated

Regeneration (high-grade recycling)
Services aimed at producing materials of the same quality if compared to the end-of-life products from which it is obtained. The process may involve materials of different types, including food, and may require the blend with virgin material.

Downcycling
Obtain materials with lower quality performances to be used in products with lower quality requirements.

Culture of Sustainability

Services that support the adoption of more sustainable practices and that nurture awareness or behavioral change

Resources for Retailers

Methods, tools, and consultancies aimed to increase retailers' knowledge in relation to sustainability

Training
Services for supporting retailers in learning sustainability practices and strategies

Case studies collections
Lists of innovative companies, products, and materials oriented to sustainability.

Assessment Solutions
Frameworks to monitor and evaluate retail impacts and performances, and to identify sustainable development opportunities. They can be surveys or dashboards.

Transparency and Traceability

Strategies that can be adopted by businesses to communicate customers the reliability of their supply chains or their processes.

Supply Chain Disclosure
Services that are aimed at guaranteeing reliability of suppliers and products using solutions that include digital product passports, breakdown of products prices, interactive maps of suppliers, and assessment of suppliers

Transparency and traceability Directories
Collections of certifications or certified suppliers created by foundations, institutions, or other trusted actors

Artisanship and Heritage

Services that help in supporting the market of artisanship and in communicating products or companies' heritage.

Online Directories
Listing of artisans with the digital showcase of their work and approach.

Artisanship online marketplace
Promote and sell artisanal products online, they can be focused on ethnical products.

B2B or B2C hiring platform
Services for hiring artisans according to their expertise.

Events and Physical Marketplaces
On-site promotion of artisanship and urban manufacturing processes and products.

Sensibilization of Customers

Initiatives aimed at improving customers literacy of sustainability.

Guides
Examples of instructions, kits, and digital applications to help consumers to adopt more conscious behaviors.

Communities
Network of consumers gathered by common interests, products typologies, or brands; exist examples of partnerships between repair communities and very well-known brands.

Events
Formats that promote sustainability, including repair events, sustainable fashion shows, and documentary projections.

Courses and workshop
Forms of events with a visible educational goal and are used to engage customers with sustainable practices. Mostly related to handicraft and circularity practices.

Products and Processes Showcase
Physical demonstrations that allow customers to assist to the execution of processes, test products, or inspect materials.

Implementation of Social Sustainability

Social initiatives aimed at distributive justice that are directly or indirectly linked to fashion distribution and that can be initiated or supported by retailers.

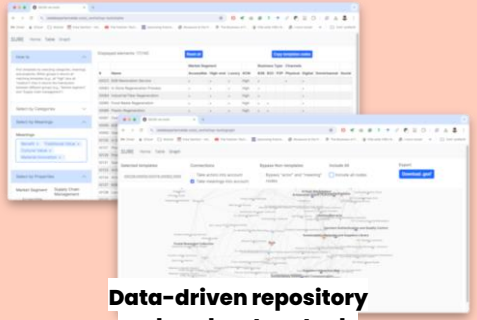
Labour Inclusivity
Inclusion of fragile people into labour activities. The initiatives can be supported by laws (ex legge 381/91) or give access to tax benefits

Socioeconomic Equity
Initiatives to increase socioeconomic equity and give support to fragile people. Can include the borrowing of objects for temporary personal needs and the nurturing of the transversal adoption of sustainable behaviours independently of social class.

Contamination Among Social Groups
Opportunities of contamination and remix of people with different cultures, ages, or needs.

Neighbourhood Engagement
Initiatives that increase the resilience of neighbourhoods by stimulating the activation/creation of local actors and networks.

Fund Raising
Raising money for a social cause.

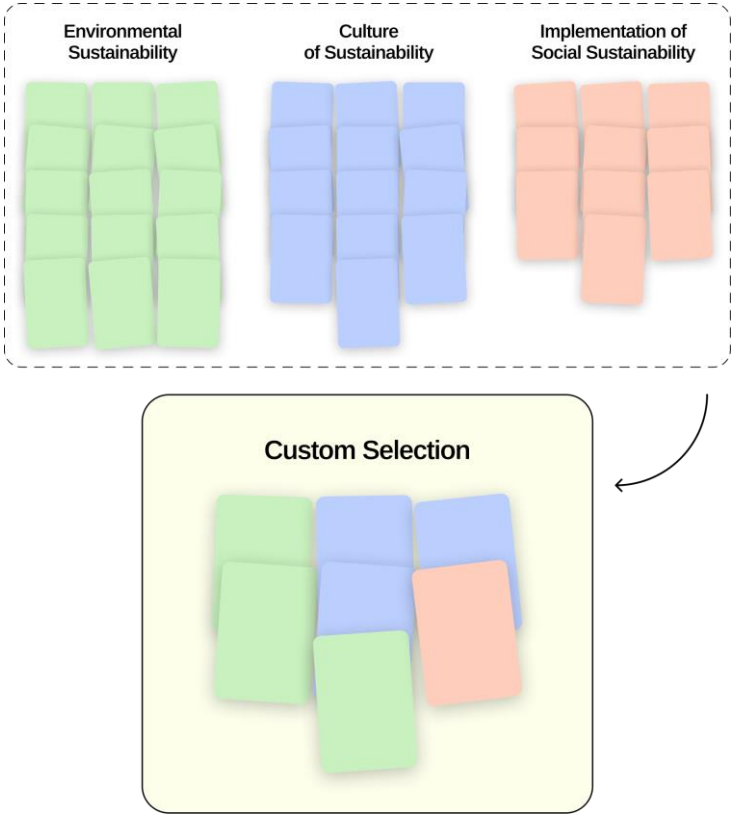


Data-driven repository and exploratory tools

Operating the model for sustainable retail

Operating the model

Supporting brands and retail companies in learning and adopting sustainable initiatives, according to their business models and organizational structures.

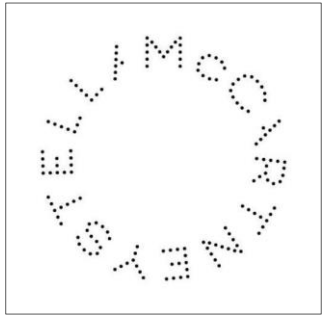


Operating the model

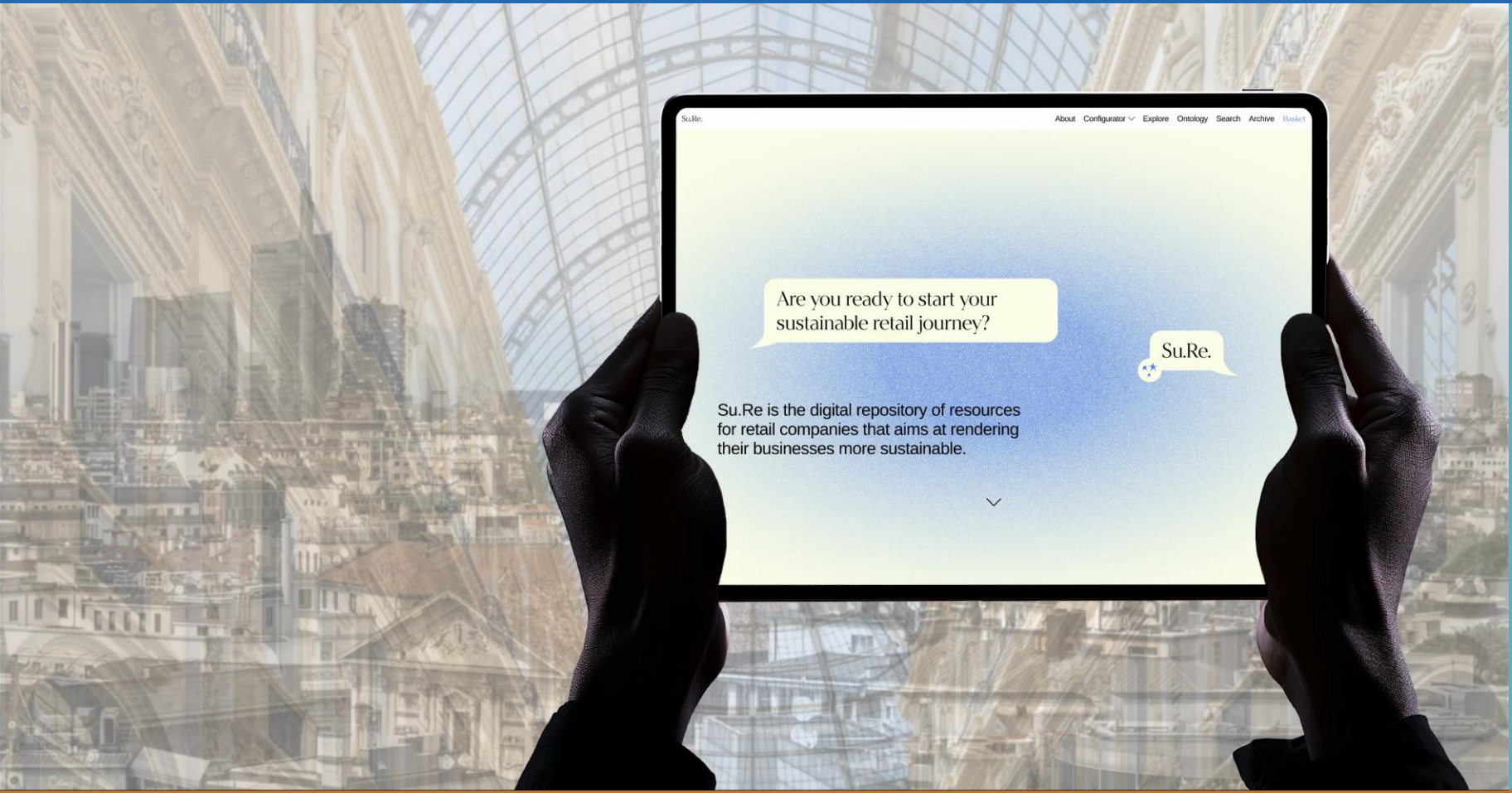
Design of a participatory activity to actively involve brands decision-makers in discussion and strategic envisioning.

Operating the model

Implementation with an excellence among brands of sustainable fashion



Disseminating results: Su.Re Digital Hub


Su.Re.
About
Configurator
Explore
Ontology
Search
Archive
Basket
Are you ready to start your sustainable retail journey?
Su.Re.
Su.Re is the digital repository of resources for retail companies that aims at rendering their businesses more sustainable.

MUSA

MULTILAYERED URBAN SUSTAINABILITY ACTION S.C.A R.L. – MUSA S.C.A R.L.

Spoke 5 -Sustainable fashion, luxury and design

WP2: T5.9-10 Sustainable Design-driven Retail and Service Model

V. Iannilli, A. Spagnoli, T. Elli, F. Bonfim, C. Anceschi

Politecnico di Milano, Dipartimento di Design

9 dicembre 2024

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musascarl.it

MUSA

MULTILAYERED URBAN SUSTAINABILITY ACTION

Ideathon:#RefashioningMilan
Rethinking Milano as the Circular Fashion and Design Capital

09/12/2024 Università degli Studi di Milano - La Statale.

Milan Fashion week September 2023:

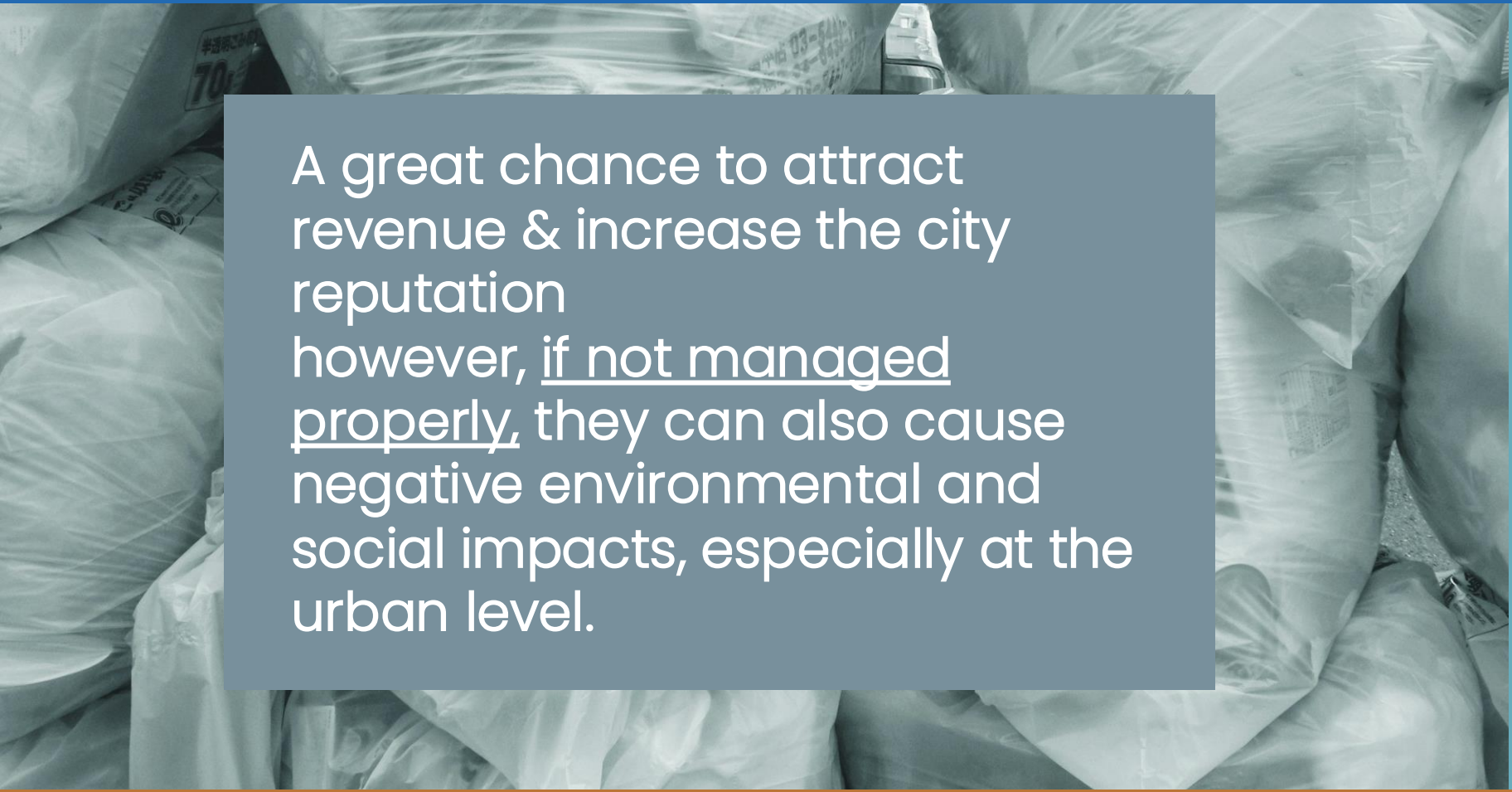
- 67 fashion shows (62 physical and 5 digital)
- 72 presentations
- 33 events
- Hundreds of thousands of people from all around the world

https://www.zoemagazine.net/193589-milan-fashion-week-19-25-september-2023/

Salone del mobile 2023:

- Exposition of 2.000 designers
- 307.418 visitors,
- 1.200 Fuorisalone's events

https://www.lombardiaspeciale.regione.lombardia.it/wps/portal/LS/Home/Approfondimenti/Dettaglio-Approfondimento/2023/edizione-record-per-il-salone-del-mobile



A great chance to attract revenue & increase the city reputation
however, if not managed properly, they can also cause negative environmental and social impacts, especially at the urban level.

With the collaboration of:

Ideathon: #RefashioningMilan

May 10th & 11th, 2024 @ Green Media Lab

PATRONAGE Comune di Milano

QUESTO EVENTO PARTECIPA A MILANO CIVIL WEEK 2024 VIVERE

Ideathon: #RefashioningMilan

01.

What is an Ideathon?

An Ideathon is an event where **teams of students** can share their creative ideas to **solve a problem or innovate a product, process or paradigm**

02.

Participants

The Ideathon is dedicated to **all students form the 4 MUSA Universities** (Bocconi, Politecnico, Bicocca, and Statale)

03.

With the collaboration of:

GIORGIO ARMANI

PATRONAGE
Comune di Milano

04.

Prizes

1. Participation at **Emporio Armani fashion show**
2. Guided tour at **Armani Silos**

Il team di Bocconi – MUSA Spoke 5 x Ideathon 2024

Francesca Romana Rinaldi
Lecturer SDA Bocconi
Director Monitor for Circular Fashion Sustainability Lab

Francesca Boni
Research Assistant
Università Bocconi

Elena Scoccianti
Research Assistant
Università Bocconi

Camilla Carrara
Research Fellow
Università Bocconi

Nicola Ruggiu
Research Assistant
Università Bocconi

Fahimeh Khatami
Junior Assistant Professor
Università Bocconi

Objectives

- **Enabling the dialogue and ideas sharing** between students and private and public companies
- Building the **Mental Mapping of Milan** as a Fashion and Design Capital
- Challenging students to reflect on:
  - **Actions** that the Municipality, Giorgio Armani, and a citizen can **implement to make Milan a Sustainable and Circular Fashion and Design Capital**
  - What a brand and City Administration can do to **organize a fashion or design event** in the city of Milan that is **sustainable, inclusive, engaging to new generations** and that does not cause burden to the city and environment, but that could **bring urban regeneration.**

Ideathon 2024 by steps

A **Individual application**
by April 8th

B **Students selection and Group Creation**
End of April

C **Two-days Ideathon event**
May 10th&11th

Applications requests

The students interested in joining the initiative had to share with their application:

- The top 5 words that come to mind when thinking of Milan (Milan Mental Mapping)
- 3 Suggestions to: Comune di Milano, a leading fashion and design player and citizens **to make Milan a leading sustainable and circular Fashion and Design Capital**

2 videos with suggestions to a brand and Comune di Milano

A

Applications results: Milan Mental Mapping

Top 5 most recurrent concepts

1. Elegance
2. Innovation
3. Luxury
4. Avant-garde
5. Cultural

Space for improvement

1. Pollution
2. Social inequalities
3. Non-inclusive

Applications results: Milan Mental Mapping

Applications results: Suggestions to brands, Comune di Milano & Citizens

Brands: 5 most recurrent suggestions

1. Designing for Durability & Repairability
2. Investing in Innovation & Traceability
3. Adopting Circular Business Models
4. Spreading Education & Awareness Campaign
5. Integrating Sustainable & Circular Materials & Practices in Production

Comune di Milano: 5 most recurrent suggestions

1. Promoting circular Fashion & Design education & research
2. Establishing circular Fashion & Design districts
3. Organizing circular events for consumers
4. Providing incentives for sustainability practices
5. Enhancing infrastructure & services

Citizens: 5 most recurrent suggestions

1. Choosing Second-Hand & Vintage Shopping
2. Supporting Local Designers & Artisanal Fashion
3. Joining Clothing Swaps & Rental Services
4. Focusing on Conscious Consumption & Waste Reduction
5. Fostering Education and Awareness on Circularity

4 Groups with different:

1. Backgrounds
2. Universities
3. Nationalities

B

10th & 11th May: 2 days event

Event details

- 16 Students participants
- 4 Groups with Multidisciplinary background created
- 1 Brief: *How can Giorgio Armani and the City Administration organize a **fashion/design event** in the city of Milan that is **sustainable, inclusive, engaging to new generations and that could bring urban regeneration?**".*

2 days event: in numbers

- **2 Key players of the brief:**

Annibale D'Elia
Director Urban Economy, Fashion and Design Comune di Milano

Rossella Ravagli
Sustainability Director
Giorgio Armani

- **3 Guest speakers:**

Simon Giuliani
Global Marketing Director
Candiani Denim

Matteo Ward
Co-Founder WRAD

Paola Arosio
Head of New Brands and Sustainability projects Camera Nazionale della Moda Italiana

- **5 Coaches:**

Camilla Carrara
Research Fellow
Bocconi University - MUSA

Gianluca Tedaldi
Junior Assistant Professor
Politecnico di Milano

Silvia Gadola
Doctoral Student (PhD)
Politecnico di Milano

Ludovico Dejak
Innovation Specialist B4i
Bocconi University

Silvia Gambi
Founder Solo Moda Sostenibile.

14 Jury Members:

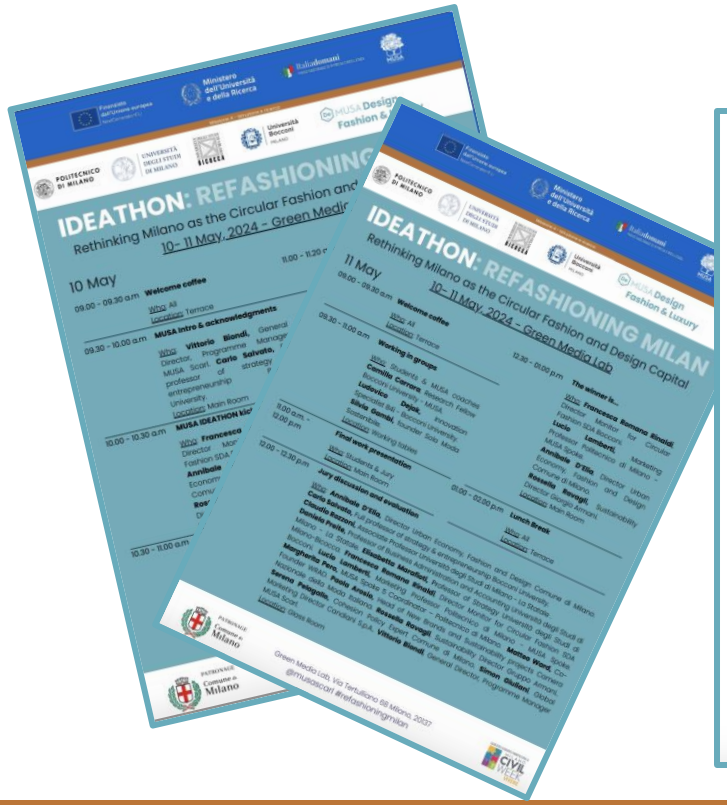
Annibale D'Elia, Director Urban Economy, Fashion and Design Comune di Milano.
Carlo Salvato, Full professor of strategy & entrepreneurship Bocconi University.
Claudio Rozzoni, Associate Professor Università degli Studi di Milano - La Statale.

Daniela Preite, Professor of Business Administration and Accounting Università degli Studi di Milano - La Statale.
Elisabetta Marafioti, Professor of Strategy Università degli Studi di Milano-Bicocca.
Francesca Romana Rinaldi, Director Monitor for Circular Fashion SDA Bocconi.
Lucio Lamberti, Marketing Professor Politecnico di Milano - MUSA Spoke.
Margherita Pero, MUSA Spoke 5 Coordinator – Politecnico di Milano.
Matteo Ward, Co- Founder WRAD.
Paola Arosio, Head of New Brands and Sustainability projects Camera Nazionale della Moda Italiana.
Rossella Ravagli, Sustainability Director Gruppo Armani.
Serena Pelagallo, Cohesion Policy Expert Comune di Milano.
Simon Giuliani, Global Marketing Director Candiani S.p.A..
Vittorio Biondi, General Director, Programme Manager MUSA Scarl.

Communication Strategy focus Italian press

1. Save the date

2. Agenda



3. Post-event press release

Media Coverage

- Fashion Magazine
- Gazzetta di Milano
- TheSpinOff.com
- Hub Style Magazine
- Chi è chi
- MpaStyle.it
- Affaritaliani.it
- Cronacamilano.it
- Icona Clima
- Icona News
- Moda Glamour Italia
- Soldoutservice.com
- Alternativasostenibile.it

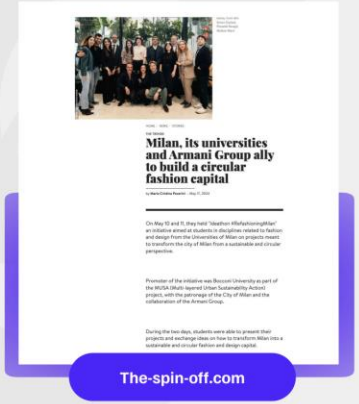
Print

Readership: 17.000

The SPIN OFF Modern. Matters.

https://www.the-spin-off.com/news/stories/The-Trends-How-Milan-wants-to-become-the-capital-of-circular-fashion-18118

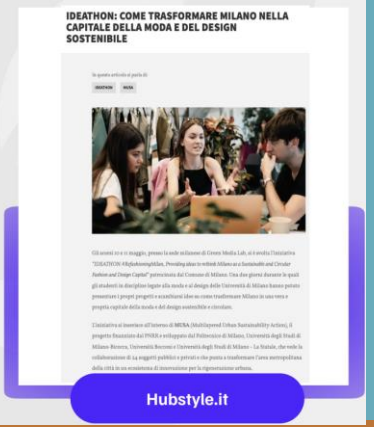
Monthly Unique Visitors: 62.327



HUB STYLE

https://hubstyle.sport-press.it/2024/05/17/ideathon-come-trasformare-milano-nella-capitale-della-moda-e-del-design-sostenibile/

Monthly Unique Visitors: 58.267



The most important review

"MUSA Ideathon has been an incredible two-days event. I deepened my knowledge of fashion & sustainability and I met many like-minded students, who shared my same interests. The group project has been the perfect opportunity to learn how to think out-of-the-box, developing innovative (but feasible!) solutions for a brand-new fashion event. As a member of the winning team, the best part has definitely been the prize: attending the Armani's fashion show has been a unique experience that I will remember forever".

Letizia

What's next?

2025's Edition

Ideathon X 2!

FASHION

DESIGN

Ideathon: #RefashioningMilan 2025

Comune di Milano

SAVE THE DUCK

MUSA Urban

KICK-OFF	ASSESSMENT SUBMISSION	GROUP ANNOUNCEMENT	2-DAYS EVENT
February	Beginning March	Middle March	March 24th & 25th
MUSA Universities start presenting the Ideathon in the classes	Students have to submit their assessment to get the chance to join the 2-days event	Through the evaluation of the assessment, students are selected and divided in groups	Group work on the brief and presentation of their projects + nomination of the winning group

Ideathon: #EcoDesignPlatforms 2025

KICK-OFF	ASSESSMENT SUBMISSION	GROUP ANNOUNCEMENT	8 WEEKS COURSE
February	Beginning March	Middle March	March-May
MUSA Universities start presenting the Ideathon in the classes	Students have to apply to get the chance to join the Passion in Action	Group project is launched and participants are selected and divided in groups	Group work on the brief and presentation of their projects + nomination of the winning group

MUSA

MULTILAYERED URBAN SUSTAINABILITY ACTION S.C.A R.L. – MUSA S.C.A R.L.

Sede legale
Piazza dell'Ateneo Nuovo n. 1, Milano (MI)

Capitale sociale
€ 100.000,00 interamente versato

Codice fiscale e iscrizione al Registro imprese Milano Monza Brianza Lodi n. 12451810969 / Iscritta al REA: MI – 2662385
Costituzione 10/06/2022 - Scadenza 31/12/2050

Codice Progetto ECS 000037
Nome del beneficiario Università di Milano-Bicocca
Titolo del progetto MUSA - Multilayered Urban Sustainability Action

Progetto realizzato/a all'interno del progetto MUSA – Multilayered Urban Sustainability Action, finanziato dall'Unione Europea – NextGenerationE, PNRR Missione 4 Componente 2 Linea di Investimento 1.5: Creazione e rafforzamento degli "ecosistemi dell'innovazione", costruzione di "leader territoriali di R&S"

Project within the MUSA – Multilayered Urban Sustainability Action – project, funded by the European Union – NextGenerationEU, under the National Recovery and Resilience Plan (NRRP) Mission 4 Component 2 Investment Line 1.5: Strenghtening of research structures and creation of R&D "innovation ecosystems", set up of "territorial leaders in R&D"

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IV General Meeting

Ecosistema dell'Innovazione

MUSA

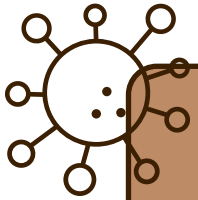
Spoke 1 – Unimi

URBAN REGENERATION: MODELLING THE IMPACT OF BIODIVERSITY ON WEST NILE VIRUS SPREAD

Elisa Fesce - elisa.fesce@unimi.it
Department of Veterinary Medicine and Animal Sciences, Università degli Studi di Milano

PI: Prof. Nicola Ferrari

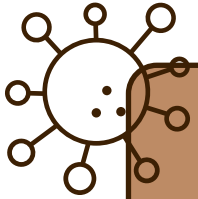
West Nile disease



Flavivirus of the family of Flaviviridae
(∋ Zika virus, dengue virus, and yellow fever virus):

- Single-stranded RNA virus
- Causes West Nile diseases

West Nile disease



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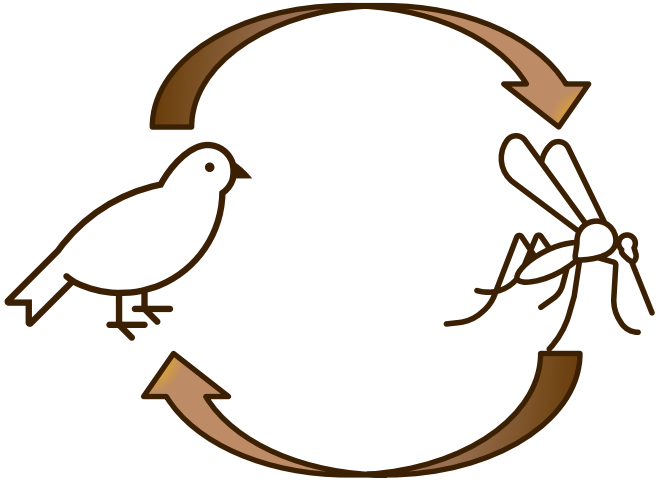
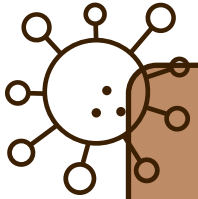


West Nile disease



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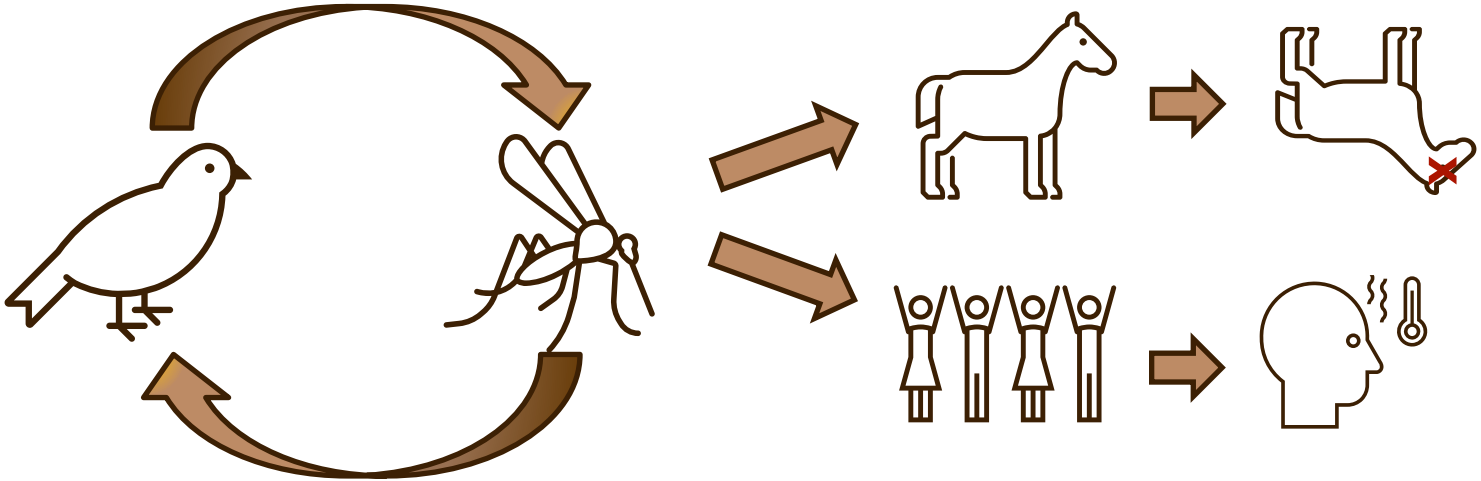
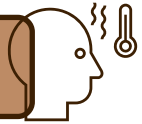


Why West Nile disease?

Why West Nile disease?

Sanitary relevance
due to human infections



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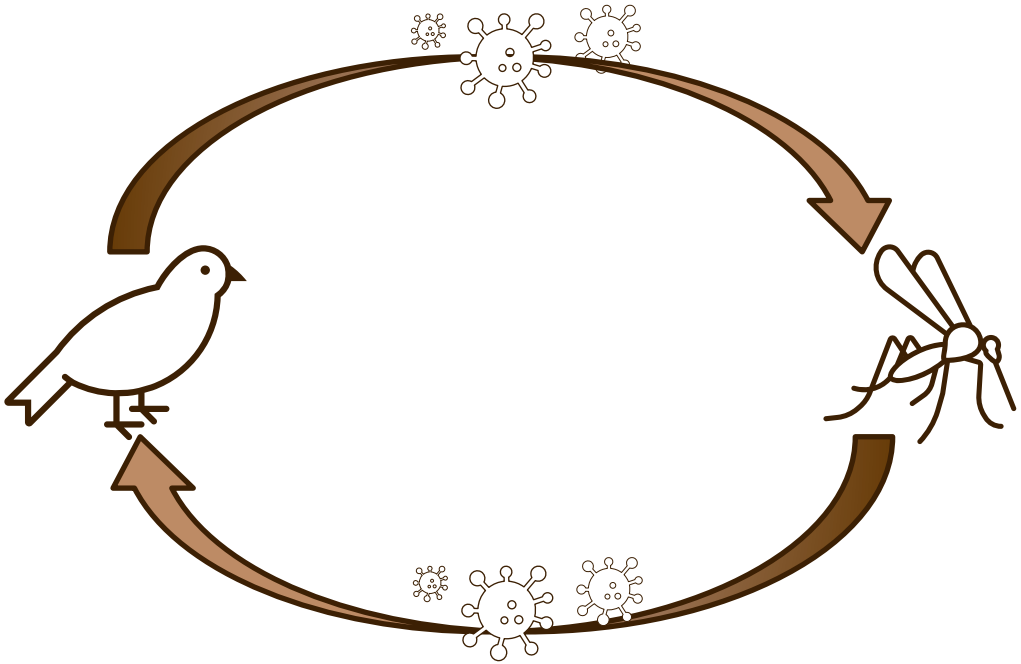

- Ubiquitous species
- Urban context

- Ubiquitous species
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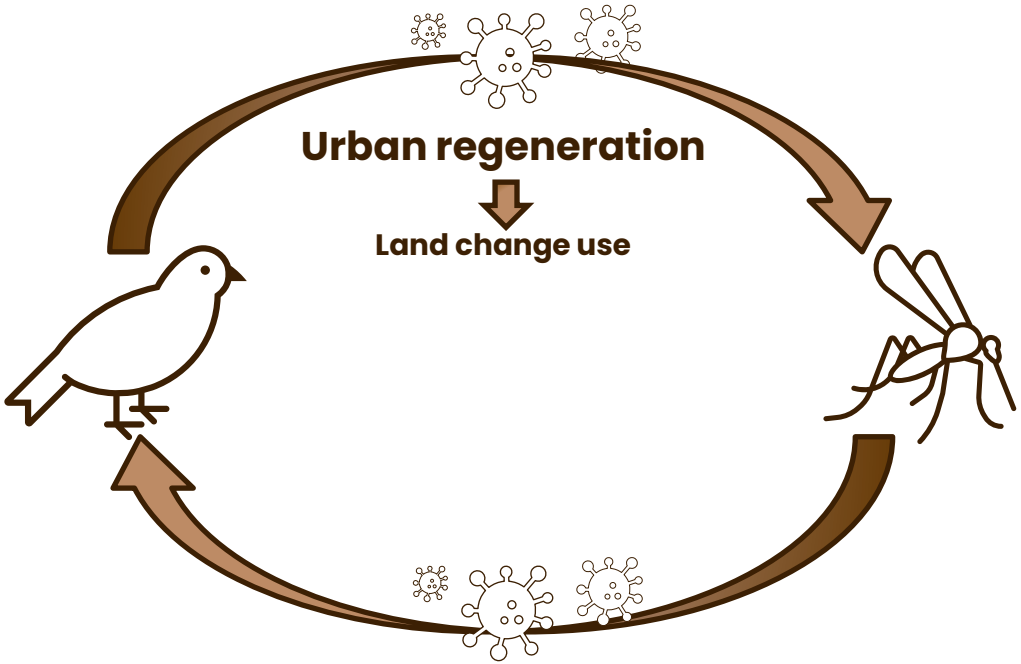

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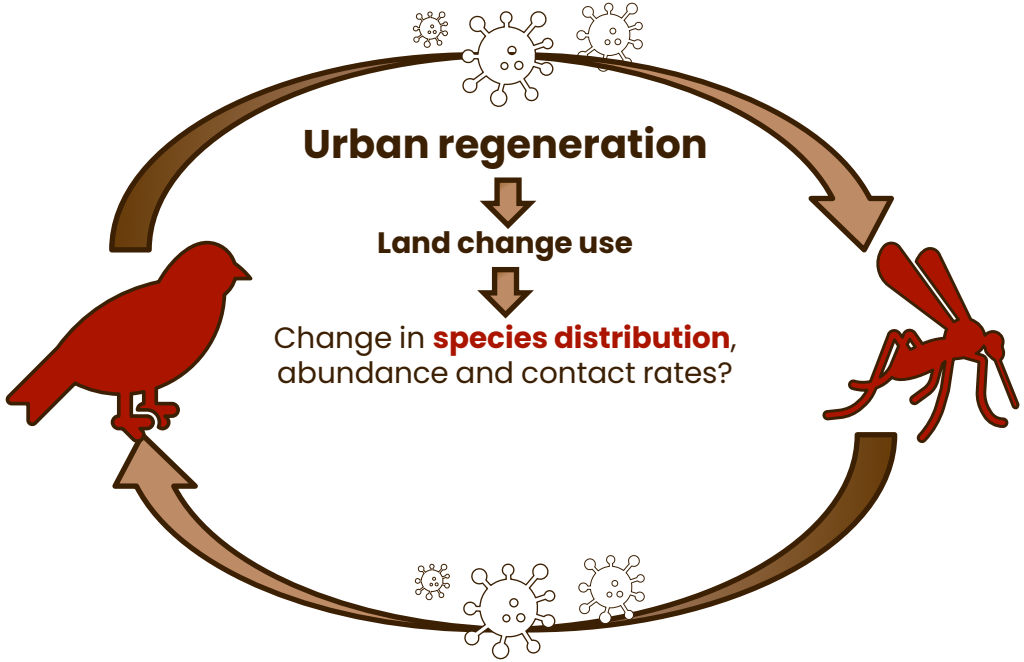

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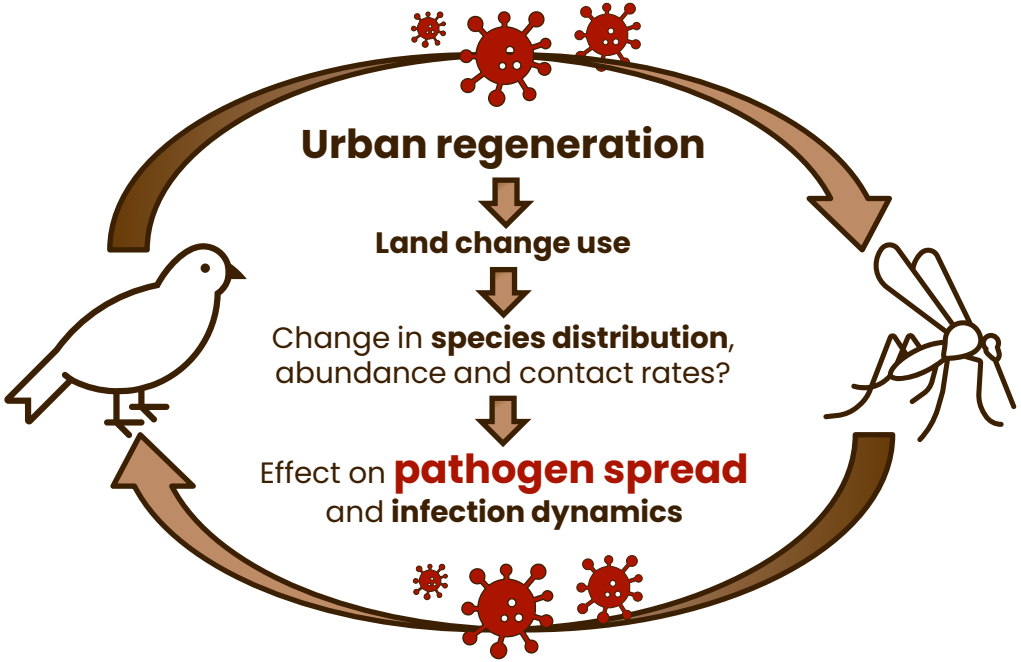

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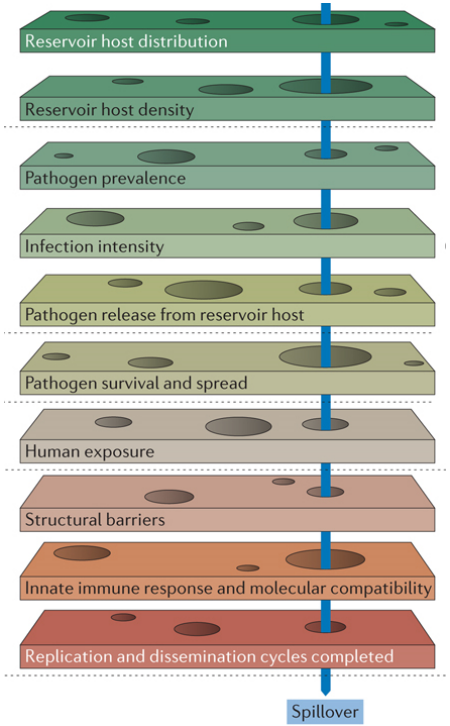
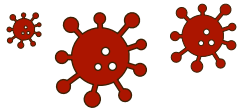
Pathogen spread

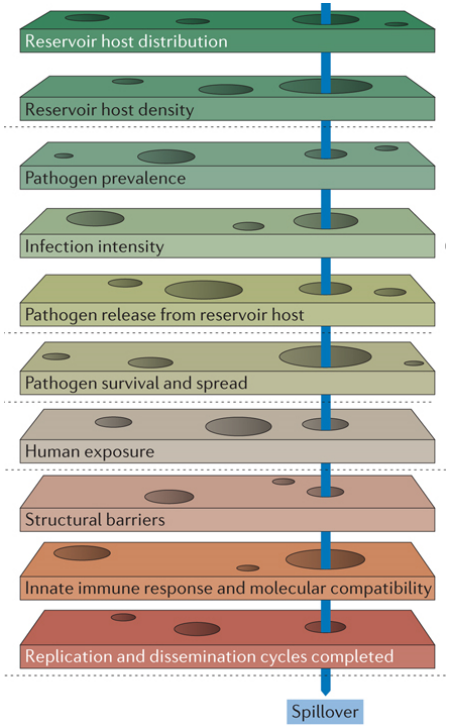




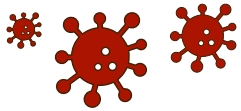
Pathogen spread
as a multilayered process

Plowright et al., 2017

Pathogen spread



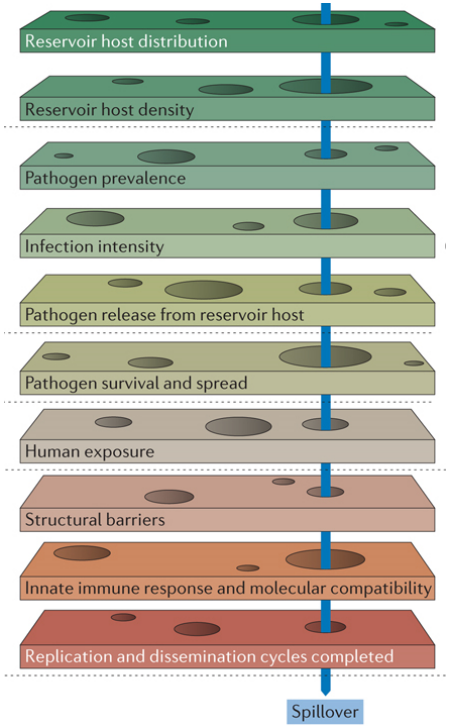
Plowright et al., 2017



Pathogen spread
as a multilayered process

Multidisciplinary approach

Pathogen spread

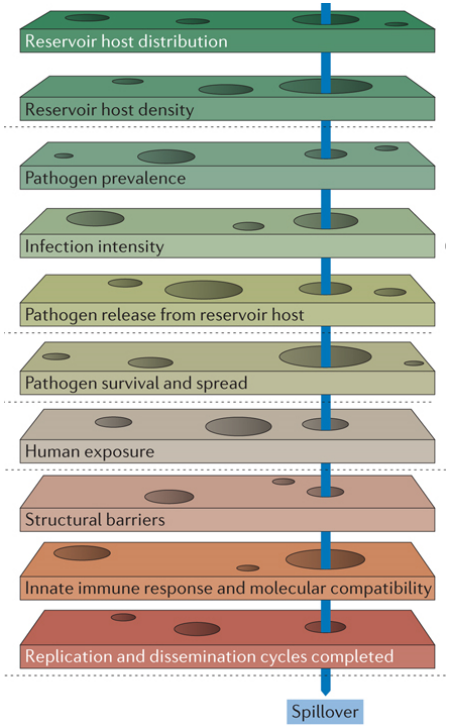


Plowright et al., 2017

Data collection

Modelling

Pathogen spread

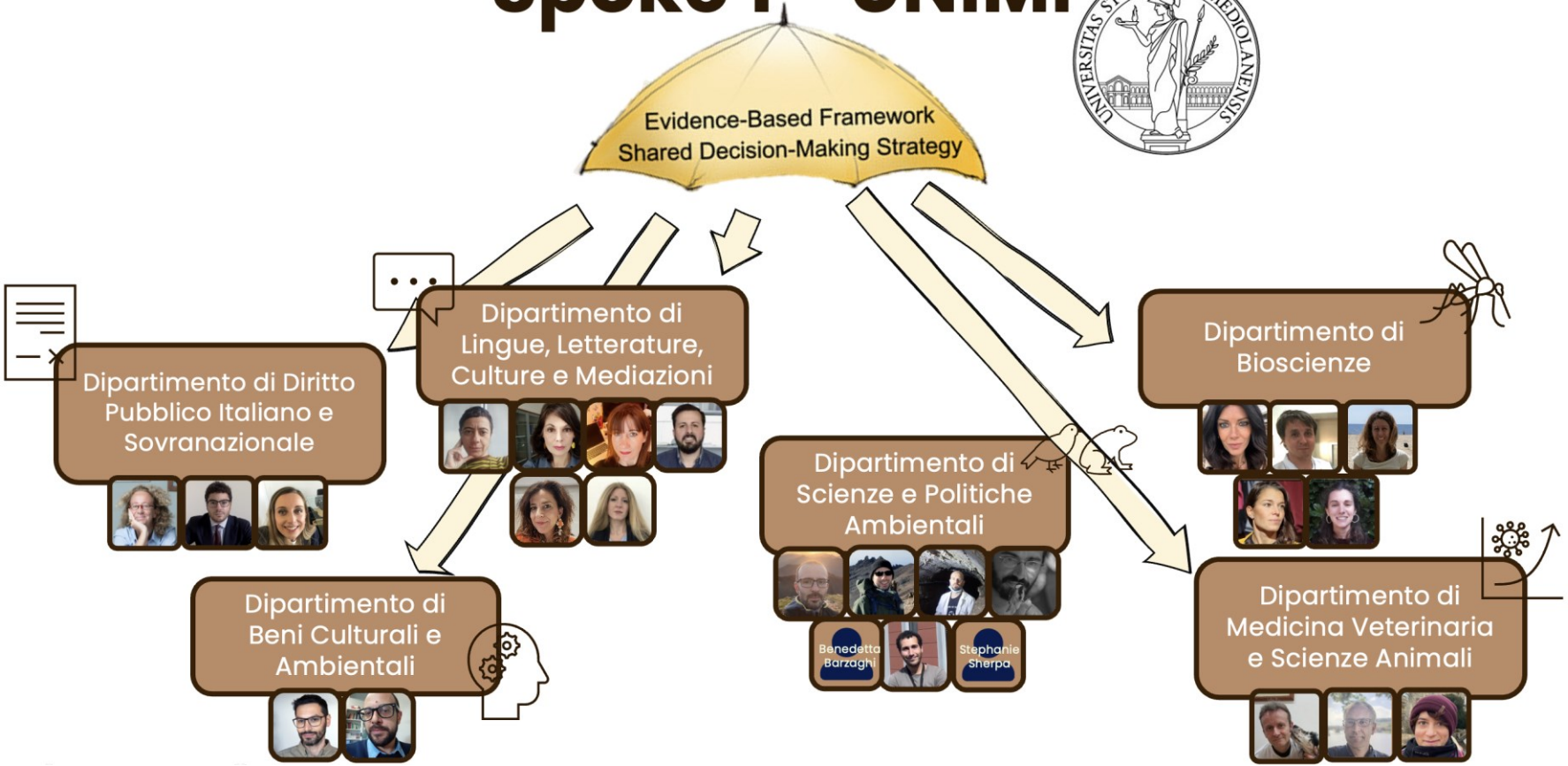


Plowright et al., 2017

Data collection

Modelling

Spoke 1 - UNIMI



Spoke 1 - UNIMI

Dipartimento di Diritto Pubblico Italiano e Sovranazionale

Collaborative contracts as model frameworks to govern sustainable **regeneration** projects in large metropolitan area

Dipartimento di Lingue, Letterature, Culture e Mediazioni

Describing and assessing the **social construction** and effects of urban **regeneration** through **discourse**

Dipartimento di Bioscienze

Monitoring **Mosquitoes**: biodiversity, spread and role as bio-indicators of urban sustainability

Dipartimento di Beni Culturali e Ambientali

Phygital tools to assess the **psychological** effects of **urban** environments and support **participatory** design

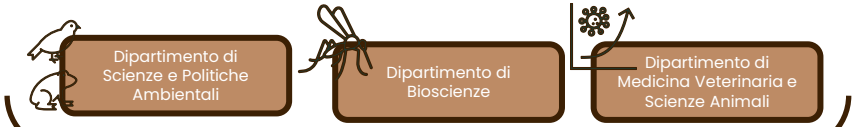
Dipartimento di Scienze e Politiche Ambientali

Mapping urban **avian diversity** through citizen science initiatives (GuardaMi) and assessing **freshwater biodiversity** and its services

Dipartimento di Medicina Veterinaria e Scienze Animali

Innovative **models** to understand and prevent vector-borne **infections**.

Spoke 1 - UNIMI



Collaborative pathways for embedding **social** regeneration into **legal** frameworks

Exploring the **wildlife** and **environmental** dimensions of urban biodiversity (animals, vector and pathogens)

Integration of **data collection**, mechanistic **modelling**, and **legal frameworks** to understand the dynamics of biological processes and develop

effective policy proposals.

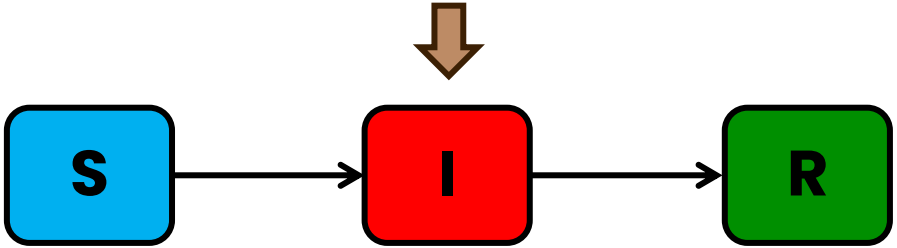
Spoke 1 - UNIMI

Epidemiological investigation using mathematical modelling

- Dynamics of the infection
- Vector-borne infections
- West Nile virus

Modelling WNV

Compartmental models based on systems of differential equations



Modelling WNV

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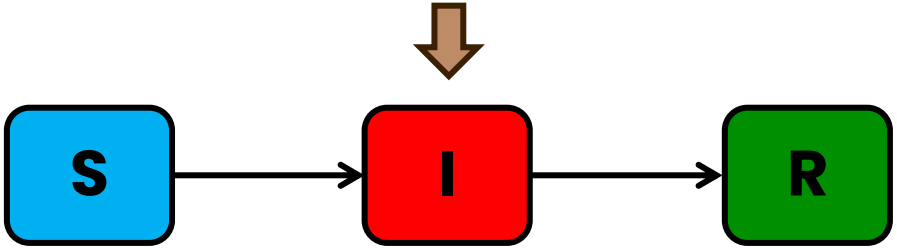
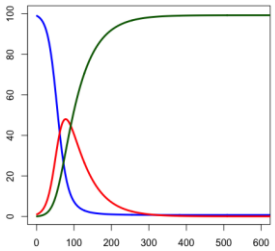
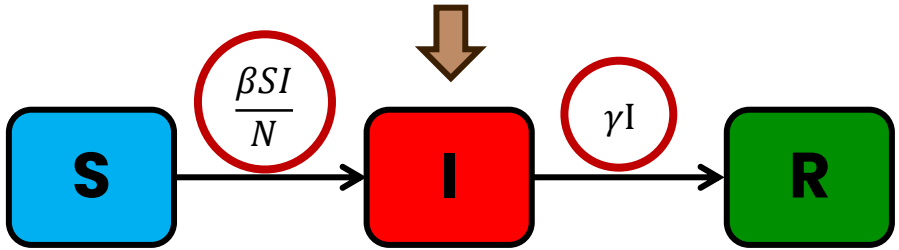


Simulate the **change in the number** of individuals (compartments) over **time**



Modelling WNV

Compartmental models based on systems of differential equations

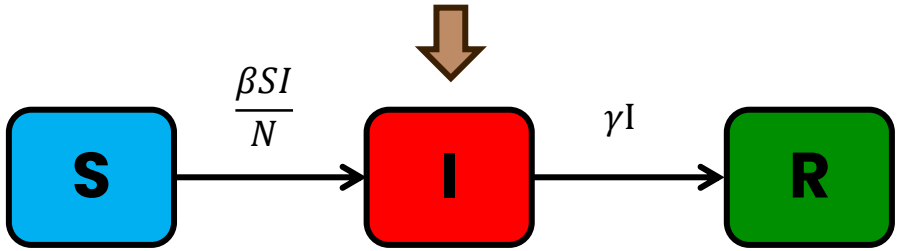


Simulate the **change in the number** of individuals (compartments) over **time**

- **Mechanisms of infection**

Modelling WNV

Compartmental models based on systems of differential equations

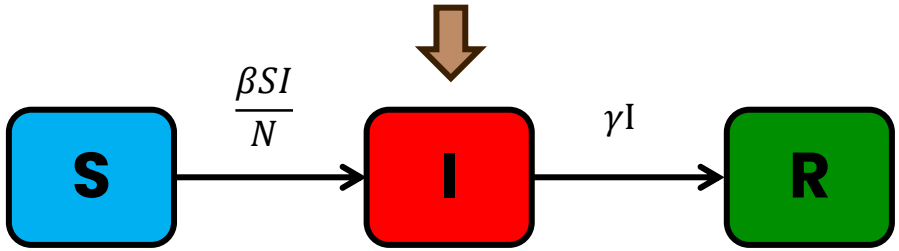


Simulate the **change in the number** of individuals (compartments) over **time**

- **Mechanisms of infection**
- **A-priori**

Modelling WNV

Compartmental models based on systems of differential equations

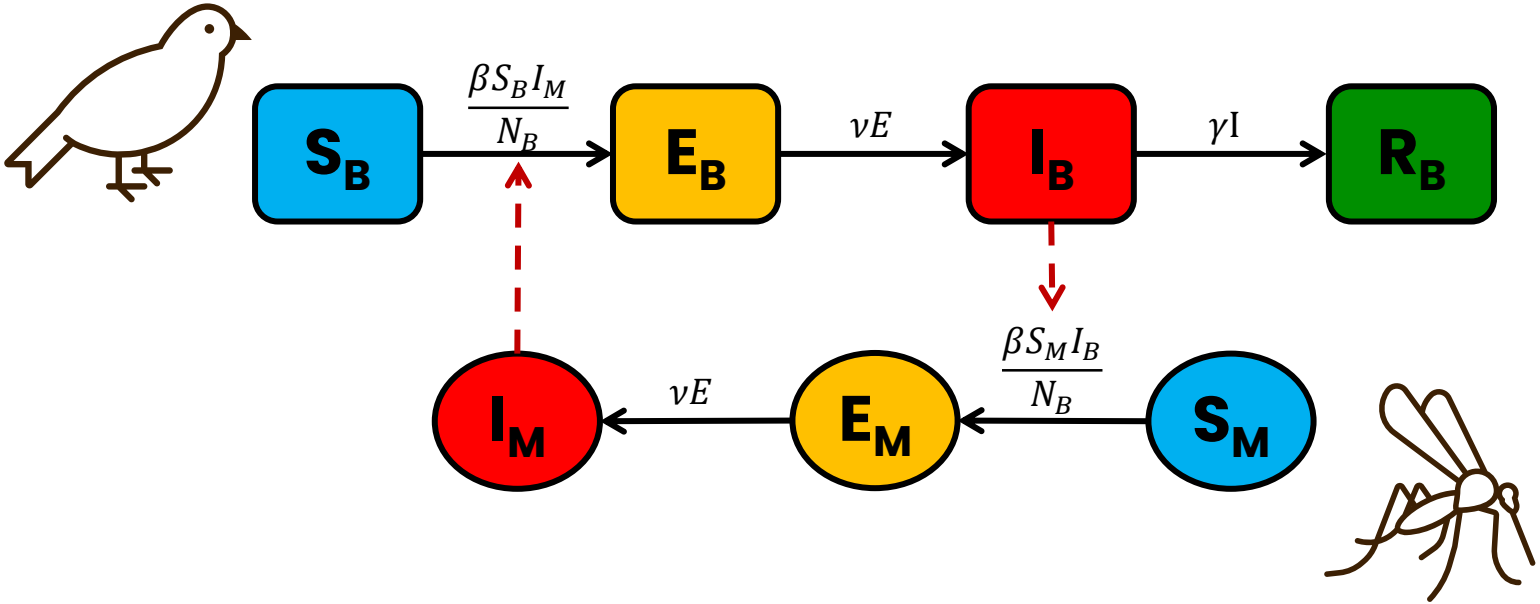


Simulate the **change in the number** of individuals (compartments) over **time**

- **Mechanisms of infection**
- **A-priori**
- **What if** scenarios

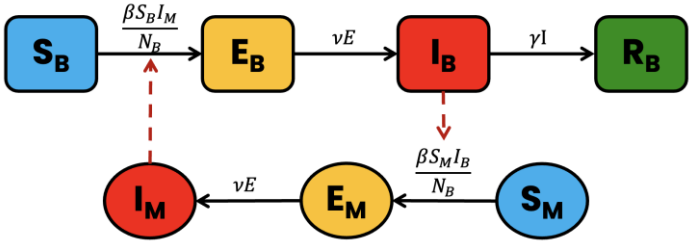
Modelling WNV

Compartmental models based on systems of differential equations



Modelling WNV

Compartmental models based on systems of differential equations



$$M'_S(t) = \omega(t) - \left(b \cdot p \cdot p_{BM} \cdot \frac{B_{Ia}(t) + B_{Ij}(t)}{B_T(t)} + \mu_M\right) \cdot M_s(t)$$

$$M'_E(t) = b \cdot p \cdot p_{BM} \cdot \frac{B_{Ia}(t) + B_{Ij}(t)}{B_T(t)} \cdot M_s(t) - (\theta_M + \mu_M) \cdot M_E(t)$$

$$M'_I(t) = \theta_M \cdot M_E(t) - \mu_M \cdot M_I(t)$$

$$B'_{Sa}(t) = -\left(b \cdot p_{MB} \cdot \frac{M_I(t)}{B_T(t)} + \mu_B\right) \cdot B_{Sa}(t)$$

$$B'_{Ea}(t) = b \cdot p_{MB} \cdot \frac{M_I(t)}{B_T(t)} \cdot B_{Sa}(t) - (\mu_B + \theta_B) \cdot B_{Ea}$$

$$B'_{Ia}(t) = \theta_B \cdot B_{Ea} - (\mu_B + \nu_B) \cdot B_{Ia}$$

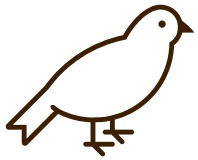
$$B'_{Ra}(t) = \nu_B \cdot B_{Ia} - \mu_B \cdot B_{Ra}$$

$$B'_{Sj}(t) = \gamma \cdot B_a - \left(b \cdot p_{MB} \cdot \frac{M_I(t)}{B_T(t)} + \mu_{Bj}\right) \cdot B_{Sj}(t)$$

$$B'_{Ej}(t) = b \cdot p_{MB} \cdot \frac{M_I(t)}{B_T(t)} \cdot B_{Sj}(t) - (\mu_{Bj} + \theta_B) \cdot B_{Ej}$$

$$B'_{Ij}(t) = \theta_B \cdot B_{Ej} - (\mu_{Bj} + \nu_B) \cdot B_{Ij}$$

$$B'_{Rj}(t) = \nu_B \cdot B_{Ij} - \mu_{Bj} \cdot B_{Rj}$$



Modelling WNV

Epidemiological processes

Is there any process in WNV spread whose effect we are underestimating?

- Duration of the infection in birds
- Competence of birds
- Susceptibility of birds
- Mosquito biting rate

Avian community

What is the effect of demographic parameters of birds?

- Hatching date
- Synchrony of hatchings
- Number of eggs

Interventions

How can we prevent the spread of the infection?

- Elimination of mosquitoes
- Reduction of the number of competent birds

Vector community

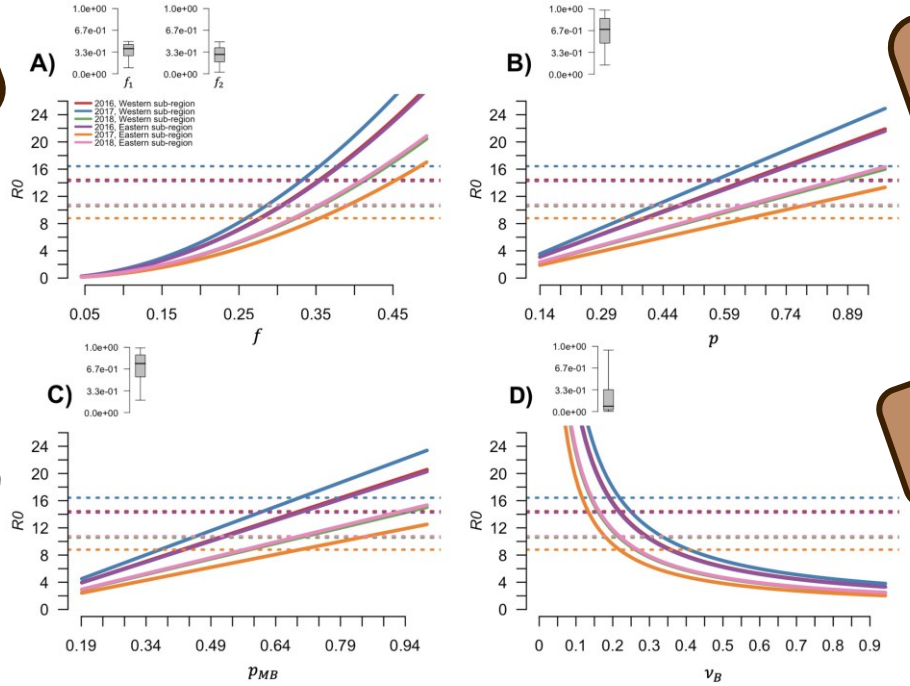
What is the role of different mosquito species?

Epidemiological processes

Is there any processes of WNV spread whose effects we are unterestimating?

Mosquito biting rate on birds

Birds' competence for WNV



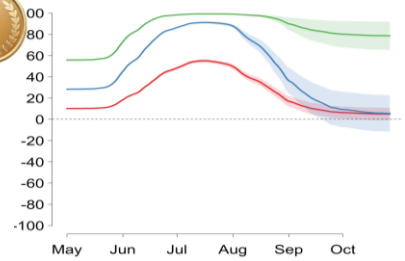
Birds' susceptibility to WNV

Duration of the infectious period

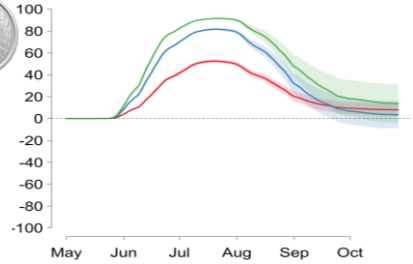
Interventions

How can we prevent the spread of the infection?

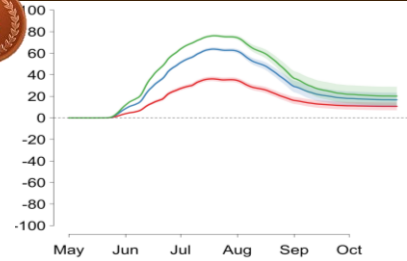
Reduction of mosquito breeding sites



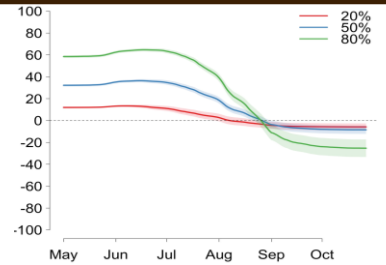
Elimination of eggs and larvae



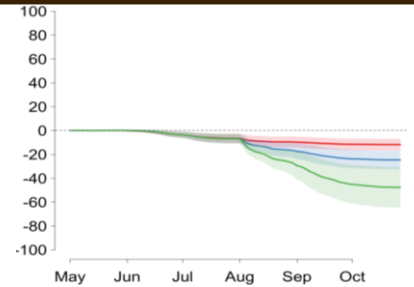
Elimination of adult mosquitoes



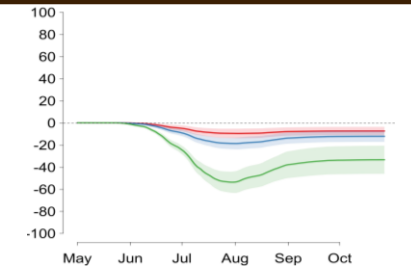
Elimination of overwintering mosquitoes



Removal of competent birds



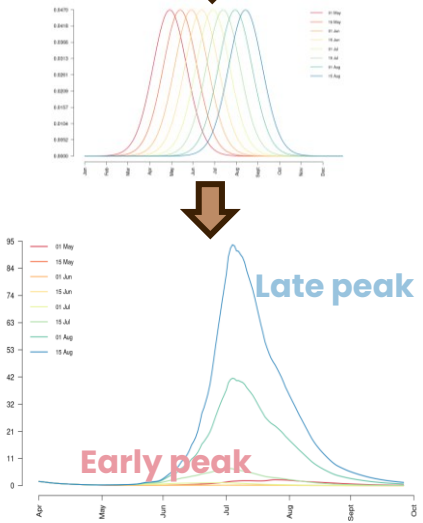
Removal of birds' breeding sites



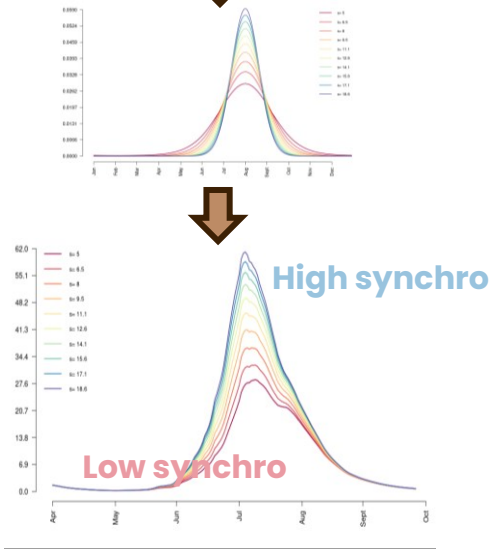
Avian community

What is the effect of demographic parameters of birds?

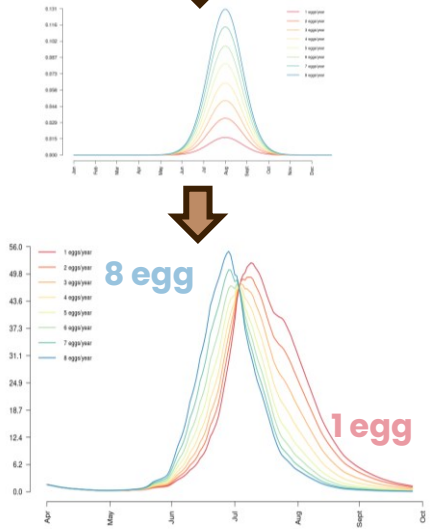
Hatching date



Synchrony of hatchings



Mean number of eggs/year



Vector community

What is the role of different mosquito species?

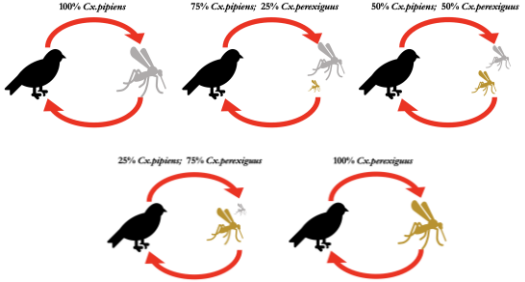
Culex pipiens

Several mosquito species involved in WNV spread:
- Different habitat preference
- Different feeding habits
- Different competence for WNV

Culex perexiguus

In silico testing of 15 scenarios

5 different compositions of the vector-community

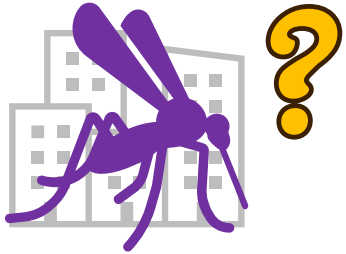


3 different mosquito biting rates on birds

Vector community

What is the role of different mosquito species?

Culex pipiens



Aedes albopictus

Designing sustainable cities

One-Health approach in urban ecosystem rehabilitation: an **evidence-based** framework for **designing sustainable cities**

iScience

CellPress
OPEN ACCESS

Perspective

The One Health approach in urban ecosystem rehabilitation: An evidence-based framework for designing sustainable cities

Antonia Bruno,[1,4] Irene Arnoldi,[2] Benedetta Barzaghi,[2] Marco Boffi,[2] Maurizio Casiraghi,[1] Beatrice Colombo,[1] Patrizia Di Gennaro,[1] Sara Epis,[2] Federica Facciotti,[1] Nicola Ferrari,[1] Elisa Fesce,[2] Gentile Francesco Ficetola,[3] Sara Fumagalli,[1] Andrea Galimberti,[1] Giulia Ghislieri,[1] Werther Guidi Nissim,[1] Luca Mainardi,[2] Raoul Manenti,[3] Valeria Messina,[1] Agata Negri,[1] Emily Palm,[1] Barbara Ester Adele Piga,[1] Nicola Rainisio,[1] Nicola Tommasi,[1] and Massimo Labra[1]

SUMMARY

Rapid urbanization has led to negative, and sometimes unintended, consequences on biodiversity and human health. While cities offer numerous advantages in meeting the basic needs of a growing population, they also pose less apparent and longer-term health costs. To address the multifaceted impacts of urbanization, an evidence-based design framework for establishing mitigation and regeneration actions is essential. Via a "One Health" approach, this perspective provides recommendations and strategies for the urban ecosystem rehabilitation of future cities, placing biodiversity and ecosystem services at the core of designing healthy and sustainable urban spaces. The framework we propose is based on a Hub and Spoke model to integrate diverse perspectives from public and private sectors and declined in a six-building-blocks structure. This will ensure that efforts are sustainable, health-centered, socially inclusive, and grounded in high-quality data, reinforcing the essential connection between healthy environments and thriving communities.

Designing sustainable cities

One-Health approach in urban ecosystem rehabilitation: an **evidence-based** framework for **designing sustainable cities**

Università degli studi di Milano Statale


iScience

CellPress
OPEN ACCESS

Perspective

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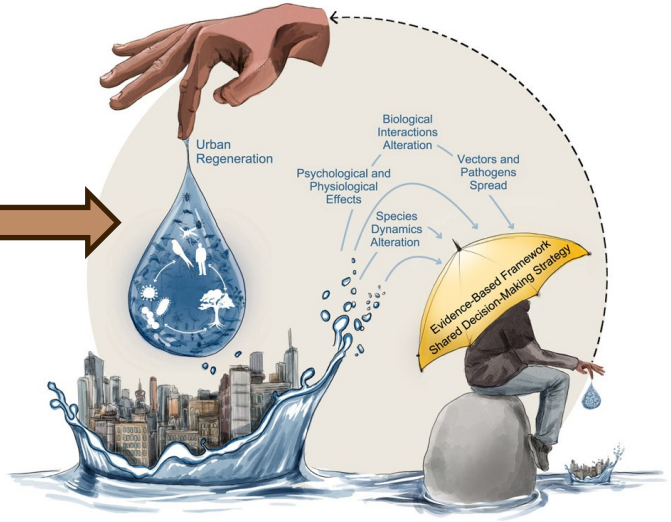
Università degli studi di Milano Bicocca

Politecnico di Milano

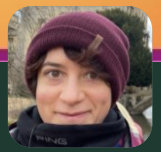


Credit to **Giulia Ghisleni** (unimib) for image creation

Bruno et al, iScience 2024, https://doi.org/10.1016/j.isci.2024.110959

Thank you!!

elisa.fesce@unimi.it



nicola.ferrari@unimi.it

MUSA

UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI LINGUE, LETTERATURE, CULTURE E MEDIAZIONE

UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI BIOSCIENZE

UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI BENI CULTURALI E AMBIENTALI

UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI DIRITTO PUBBLICO ITALIANO E SOVRANAZIONALE

UNIVERSITAS STUDIORUM MEDIOLANENSIS

divas

Wildlife Health Lab

MUSA Urban

Urban regeneration & City of tomorrow

MUSA Data

Monitoring of maternal and fetal well-being during pregnancy:

towards a wearable and telehealth system with AI based solutions and biosignal analysis

Spoke 2 – Healthcare services

Giulio Steyde, PhD candidate.

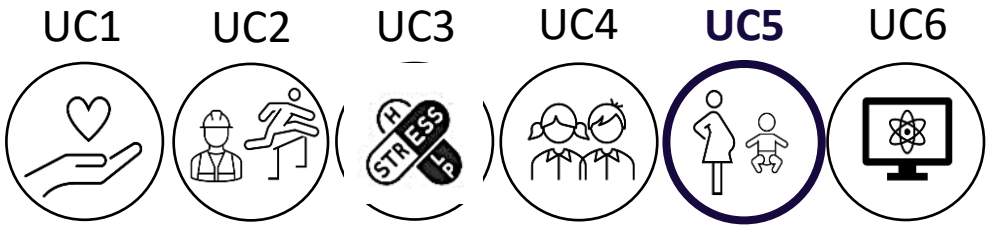
Starting Date: Feb. 2023

Track: Bioengineering - Polimi

POLITECNICO MILANO 1863

MUSA spoke 2 –WP4

- Task 4.1 Use-Cases (UC) definition
- **Task 4.2 Wearable technology**
- Task 4.3 M-health platform design
- **Task 4.4 Data analysis**
- Task 4.5 Co-design of innovative solutions



UC5

Promotion of well-being in pregnancy using AI methods and wearable devices

MUSA spoke 2 –WP4

- Task 4.1 Use-Cases (UC) definition
- **Task 4.2 Wearable technology**
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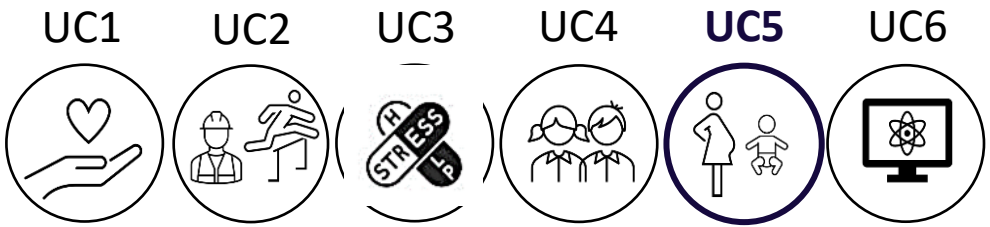


UC5

Promotion of well-being in pregnancy using AI methods and wearable devices

Maternal Monitoring: analysis of heart rate variability in pregnancy during sleep

Mendez MO, Bianchi AM, et al. "Multifractal analysis of heart rate variability in pregnancy during sleep." Front Cardiovasc Med. 2024 Aug 6;11

Fetal Monitoring: Non-invasive assessment of fetal well-being

PhD Student: **Giulio Steyde**
Supervisor: Maria Gabriella Signorini

Pregnancy is a physiological process, but is also a very delicate moment

- Several complications can threaten the fetal and maternal **well-being**

Effective fetal **monitoring** is crucial

- early detect risky conditions and intervene when necessary, reducing risks

Recent developments in **wearable devices**

- allow for unobtrusive **monitoring at home**

Methodologies based on **Artificial Intelligence**

- **automatic analysis of big amount of data** is now possible

Fetal heart rate variability (fHRV) marker of fetal well-being.

In practice the only available functional information on fetal neurodevelopment

It can be used to:

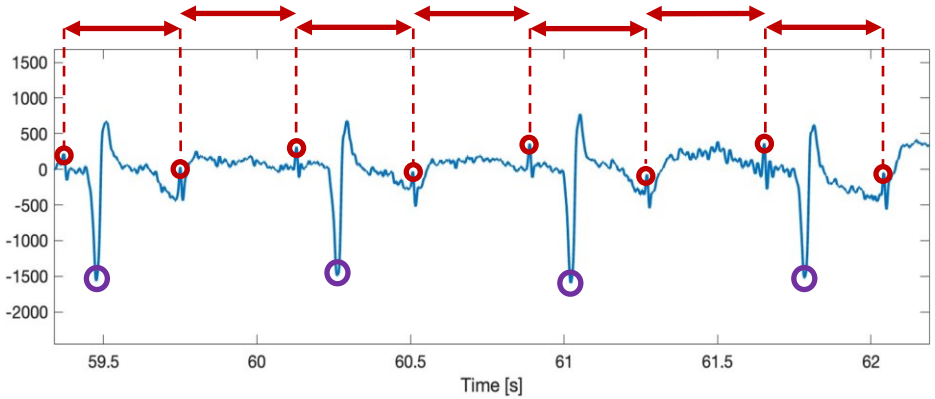
- Asses fetal behaviour (active/quiet, awake/asleep)
- Detect conditions of risk (hypoxia, growth restriction)

The fetal HRV can be reliably recorded with wearables at home

 effective monitoring for long periods of time and at different stages of pregnancy

Market analysis of available solutions and comparison with clinical-grade devices

Task 4.2 Wearable technology

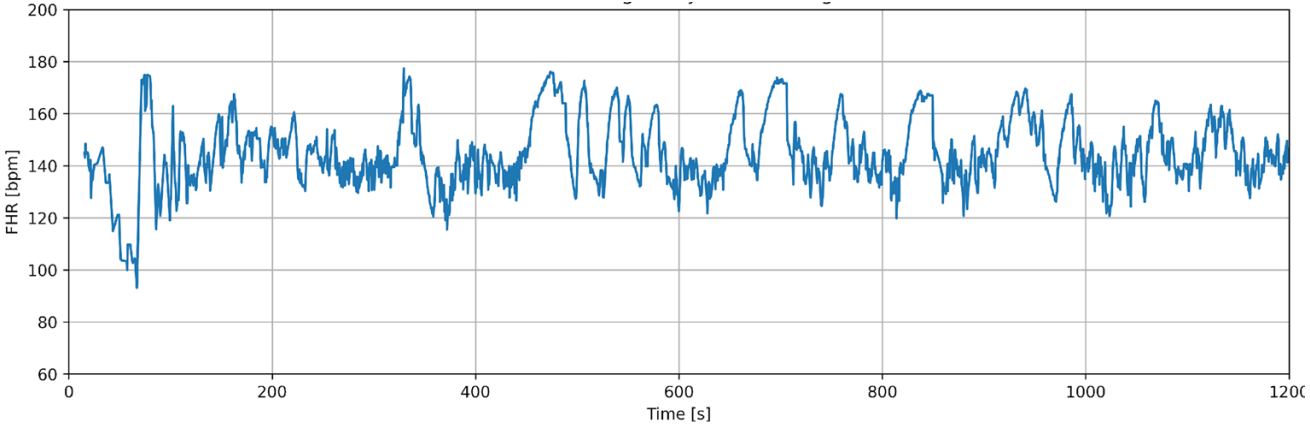


An healthy heart is not a metronome

Cardiac variability (HRV) is the series of the time distance between consecutive heartbeats.

The presence of HRV reflects the modulation of the nervous system on the heart.

The fetal HRV presents typical patterns which can be analyzed «by eye» or **automatically**

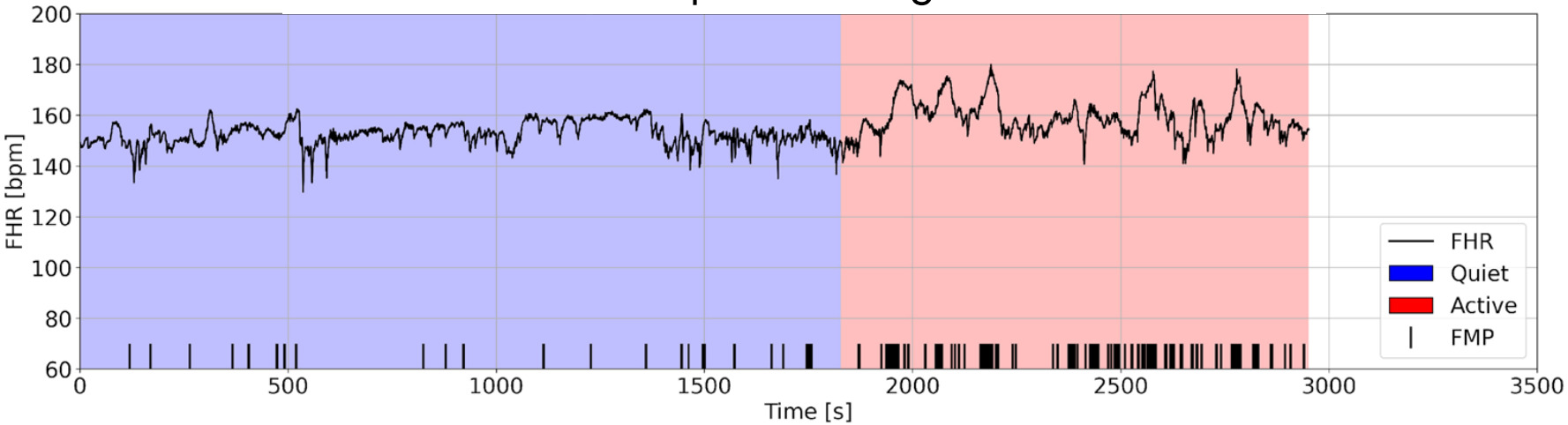


Develop novel methodologies for analysis and interpretation of fetal and maternal biomarkers for promoting wellbeing and health in the perinatal period

Focus	Fetal Heart Rate Variability analysis
Strategy	Advanced Signal Processing techniques and Explainable Artificial Intelligence
Data Source	NAPAMI: a novel very big and growing (N = 24491) annotated dataset of cardiotocographic recordings
Perspectiv e	Implementation on wearable devices

Results should be generalizable to FHR aquired with wearable devices that can be used at home

Example of FHR signals:



Fetal heart rate (FHR) patters are indicative of the underlying fetal **behavioral state**.

- They are one of the very first manifestations of behavior and **neurodevelopment**
- A healthy fetus cycles among behavioral states
- Monitoring the cycling of behavioral states is fundamental in assessing fetal **well-being**

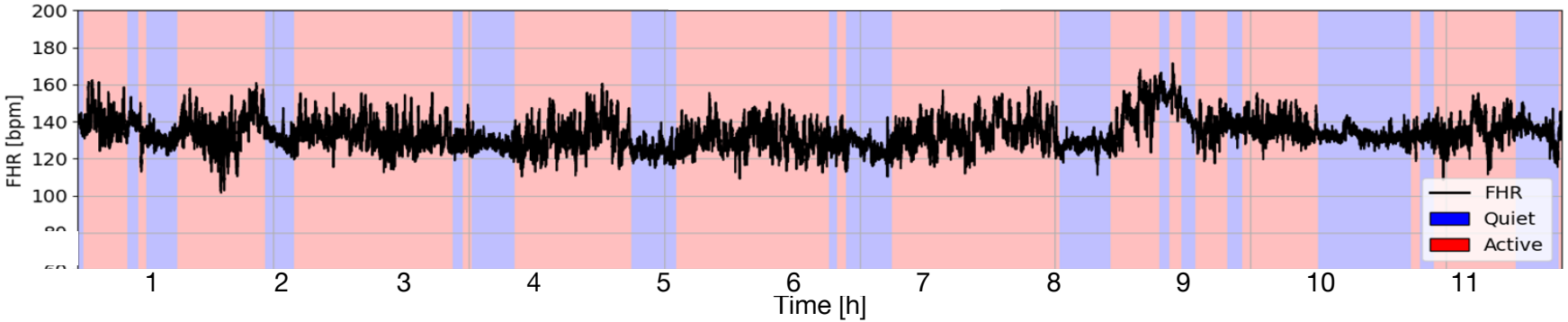
Automatic identification of FHR patterns helpful in the continuous assessment of fetal well-being

Task 4.4 Data analysis

We trained a **Deep Neural Network (DNN)** using our database recorded in clinic and annotated by expert clinicians to automatically **recognize fetal behavioural states.** Accuracy: 88%

G. Steyde, et al., "A semi-Supervised Deep Learning Approach to Automate the Identification of Fetal Behavioral States in Fetal Heart Rate Tracings," 2024 MeMeA, Eindhoven, Netherlands, 2024

And applied the DNN on signals aquired at home with wearable devices



Ongoing collaborations

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK

TU/e Technische Universiteit Eindhoven University of Technology

Intra Uterine Growth Restriction (IUGR)

A fetus that fails to reach their potential growth

- Incidence around 10%
- Increased perinatal mortality and morbidity
- IUGR goes often undetected
  - ⇒ **early detection** is crucial

Use of the fetal HRV as a form of **screening for Intrauterine Growth Restriction** using Artifical Intelligence

A **Deep Neural Network** (ResNet architecture) was trained to recognize fetal HRV signals of IUGR-affected fetuses and those originating from healthy fetuses.

The training set includes **~10.000 subjects**

Promising results ⇒ **80% of balanced accuracy in test**.

G. Steyde, L. Subitoni, E. Spairani, G. Magenes and M. G. Signorini, "- Siamese Neural Networks for IUGR Identification in Cardiotocographic Recordings," 2024 CinC, Karlsruhe, Germany, 2024

Distribution to population for **well-being monitoring** in pregnancy

Implementation on **wearable devices** that can be used at home

Exploit data to develop methodologies for **automatic data analysis**

Collection and organization of **large amounts of data**

MUSA **Data**

Haptic and Virtual Models for Surgical Training and Personalized Medicine

Lorenzo Migliorini

AGING OF POPULATION and increase in pathologies.

HIGH DEMAND FOR EXPERIENCED SURGEONS and insufficient qualified medical staff.

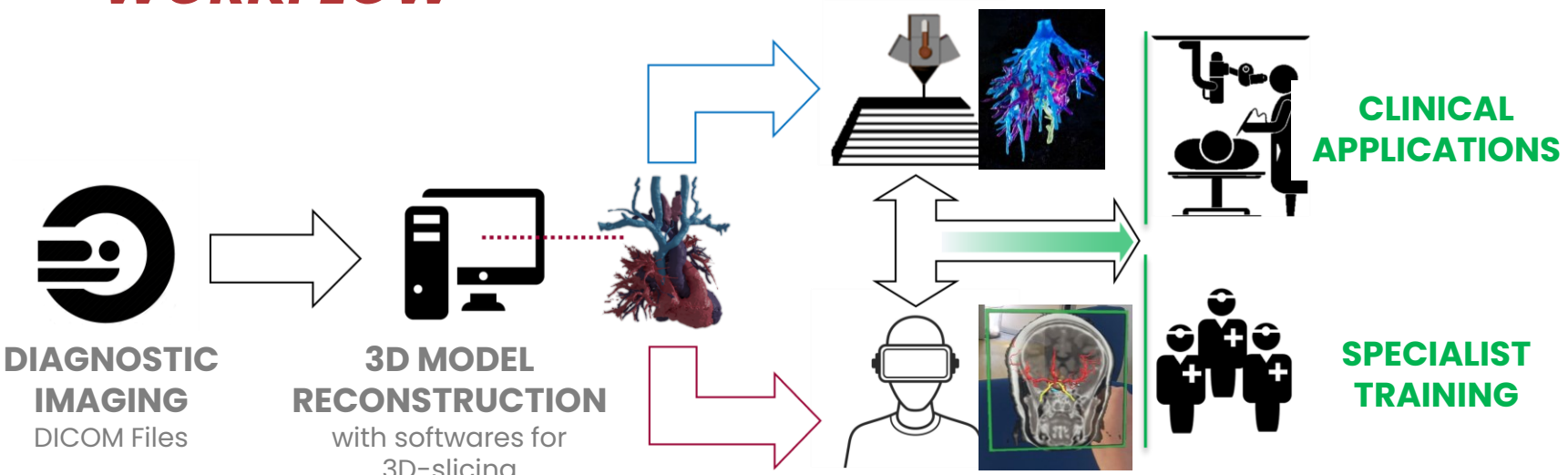
HIGH COSTS and **LEGAL ISSUES** related to operating room.

PSYCHOLOGICAL PRESSURE related to learning on real patients.

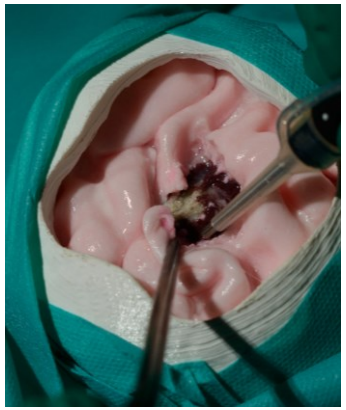
- Simulation platforms for **personalized medicine** & **specialized surgical training**.
- Combination of **extended reality** and **tissue-mimicking physical models**.
- Monitored environment, free of risks and easily accessible in presence and remotely.
- Collection, sharing and employment of diagnostic, anatomical and functional data.

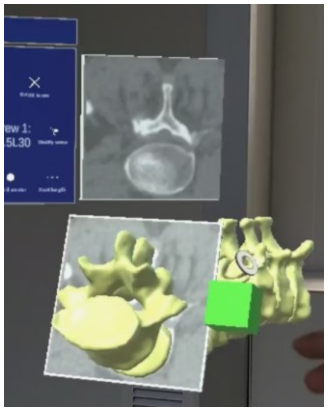
SURGICAL SIMULATIONS
with physical and digital phantoms

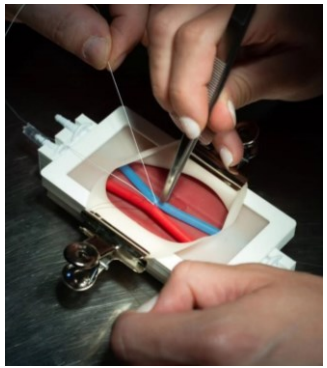
WORKFLOW

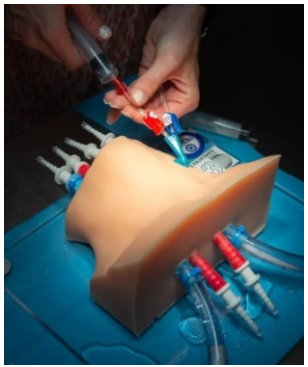

PRINTED
PHYSICAL MODEL
Soft materials, haptic and echogenic
CLINICAL
APPLICATIONS
SPECIALIST
TRAINING
DIAGNOSTIC
IMAGING
DICOM Files
3D MODEL
RECONSTRUCTION
with softwares for
3D-slicing
EXTENDED REALITY
Virtual, augmented, user-friendly

SPECIALIST TRAINING









8 Practical Training Courses in 2022
26 Practical Training Courses in 2023

Specialties:

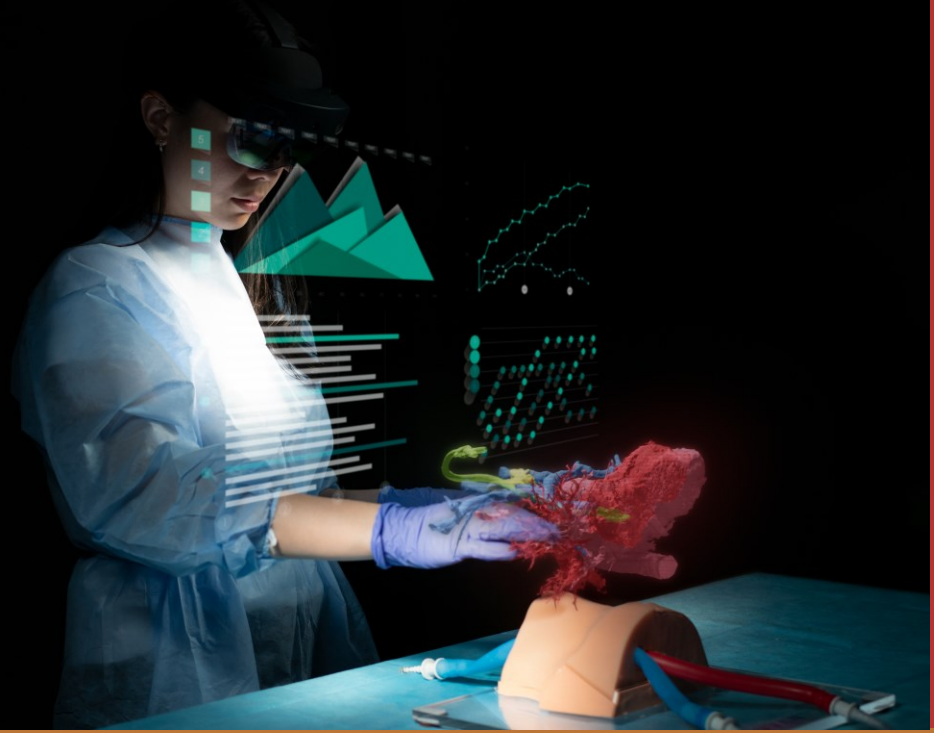
Nephrology
Neurosurgery
Pediatric Surgery
Emergency Surgery
Hepatobiliary Surgery
Microsurgery
Vascular Surgery
Basic Surgical Techniques

Trained students: 250

RECENT ADVANCEMENTS

1. From surgery to **ELECTROSURGERY**

2. **INTERCONNECTED** and **ACTIVE PHYGITAL PHANTOMS**



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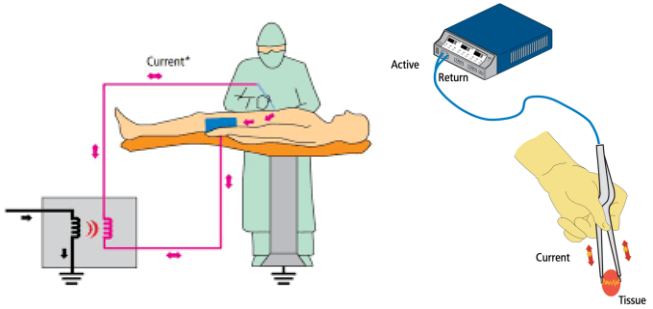
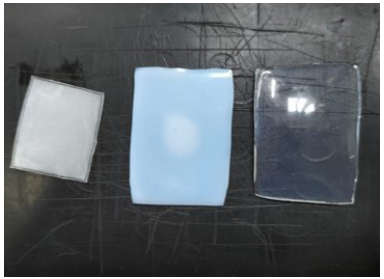
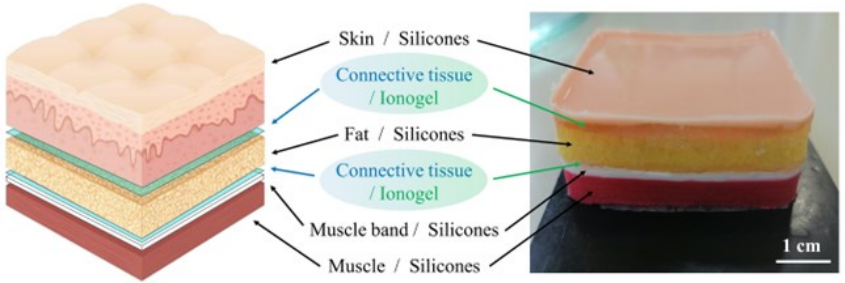


SOFT CONDUCTIVE GELS
Tissue-mimicking and electro-sensitive.



CASE EXAMPLE
Electro-cutting of connective tissues in the skin stratification

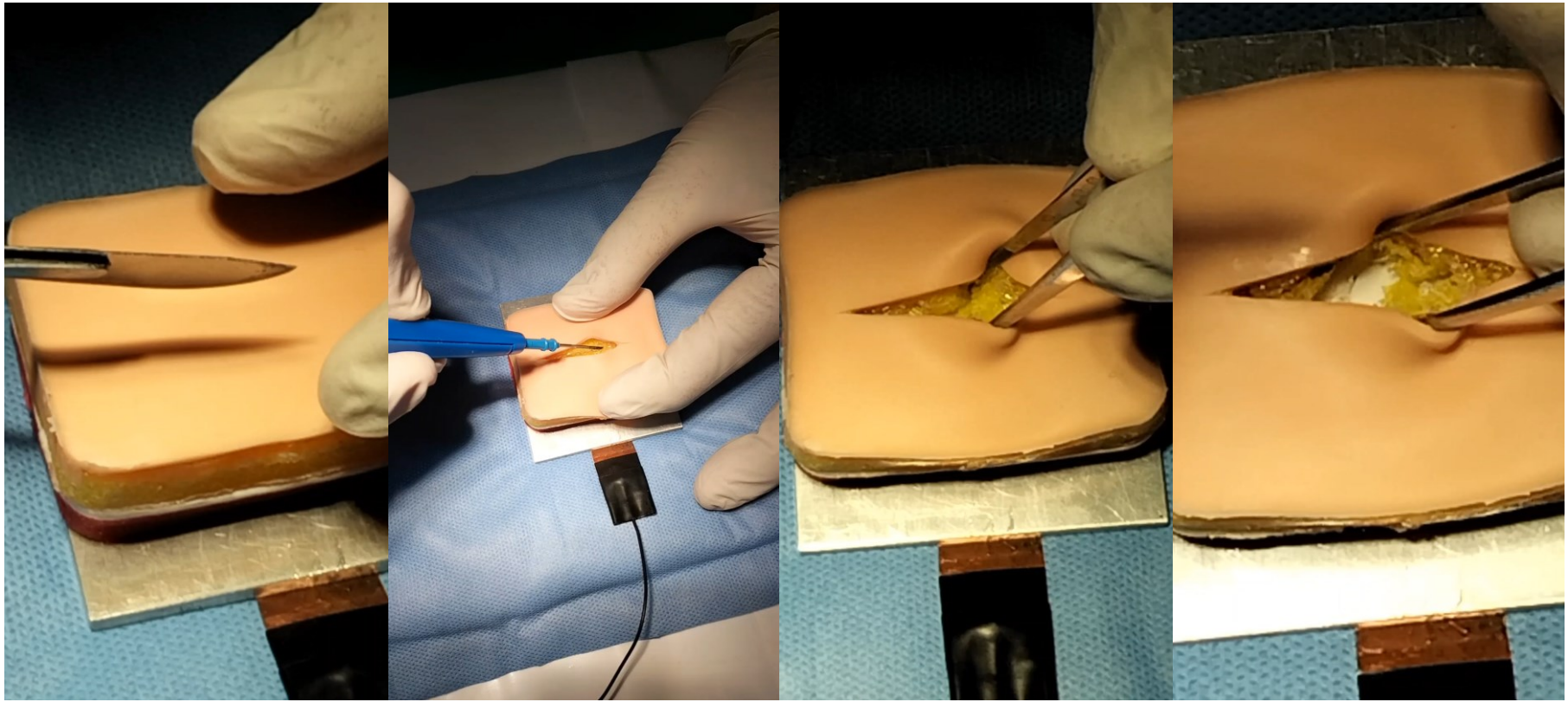


COLD SCALPEL

ELECTRIC SCALPEL

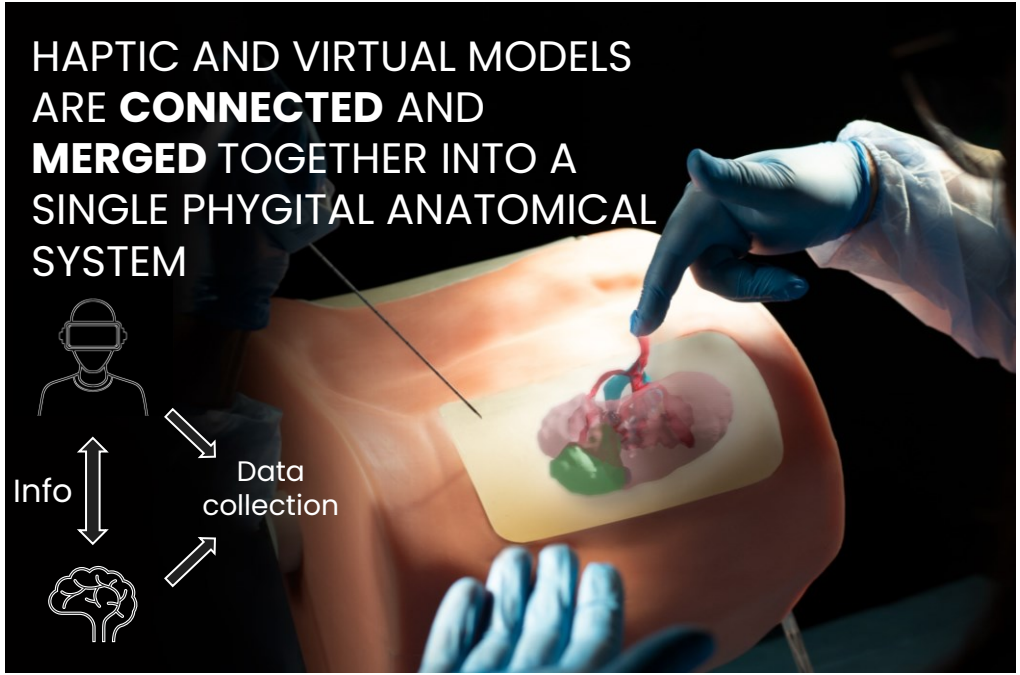
Migliorini et al., Adv. Mater. Interfaces 2024, 10.1002/admi.202400246

1) Cold scalpel | 2) **Electric** scalpel | 3) Cold surgery | 4) **Electric** scalpel



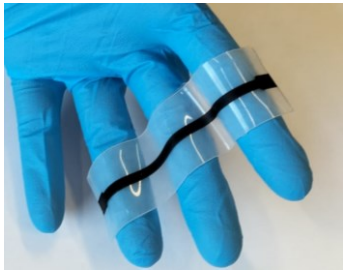
Migliorini et al., Adv. Mater. Interfaces 2024, 10.1002/admi.202400246

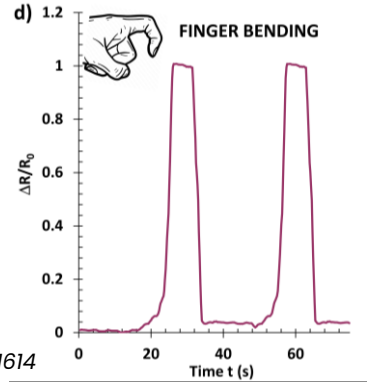
2) Active & interconnected **PHYGITAL PHANTOMS**



3D PRINTED SOFT SENSORS

Electro-active, tissue-mimicking, resilient.
Es. Strain/pressure sensors





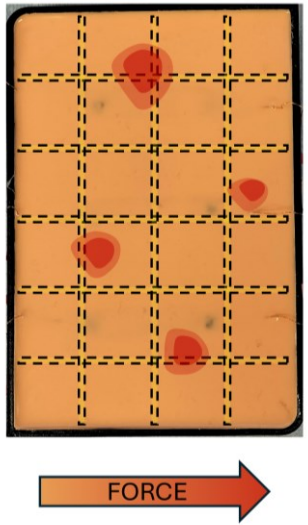
- Polymer-metal nanocomposites
- Conductive ionogels

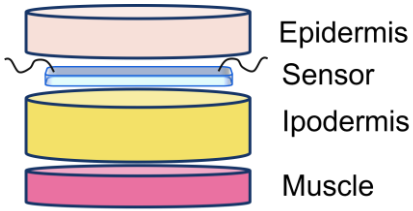
Migliorini et al., ACS Appl. Nano Mater. 2023, 10.1021/acsanm.3c01614

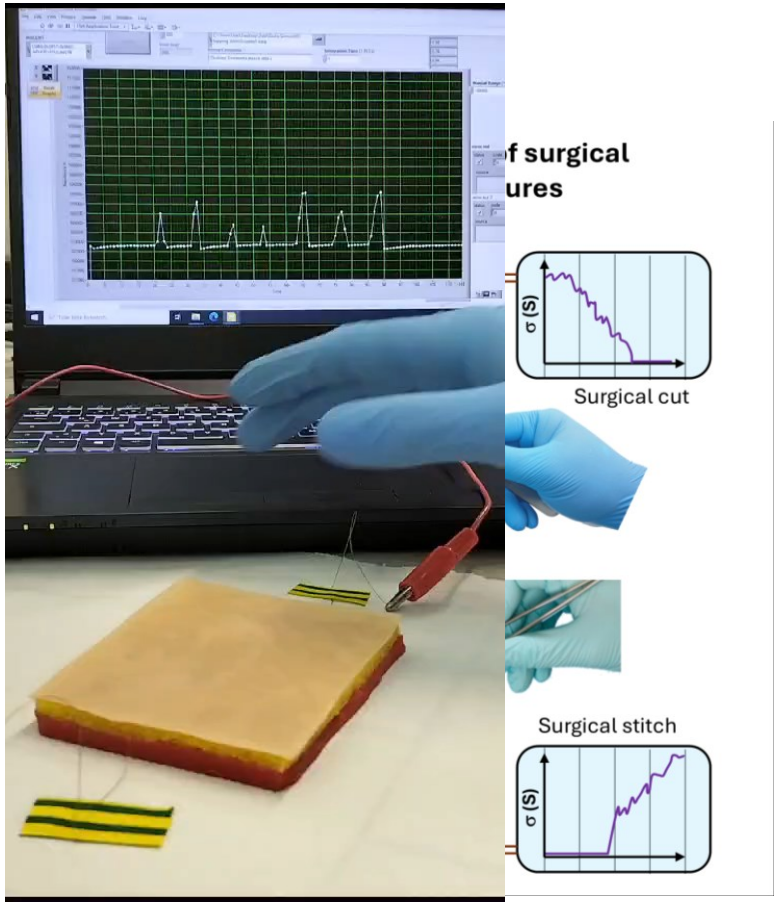
2) From passive to **ACTIVE phantoms**

A) Sensitive artificial skin

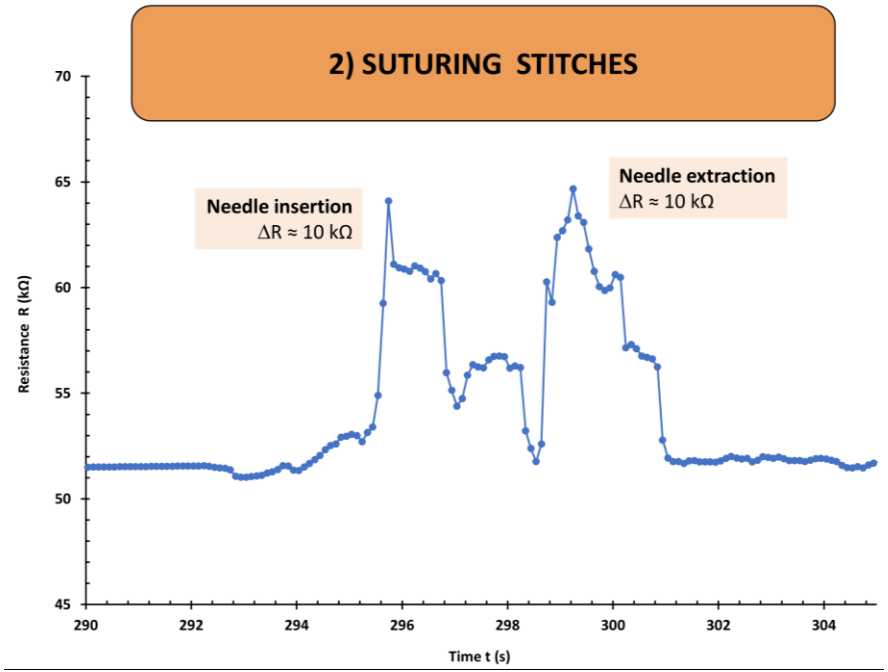
A sensor grid would allow the detection of the applied force's entity and position







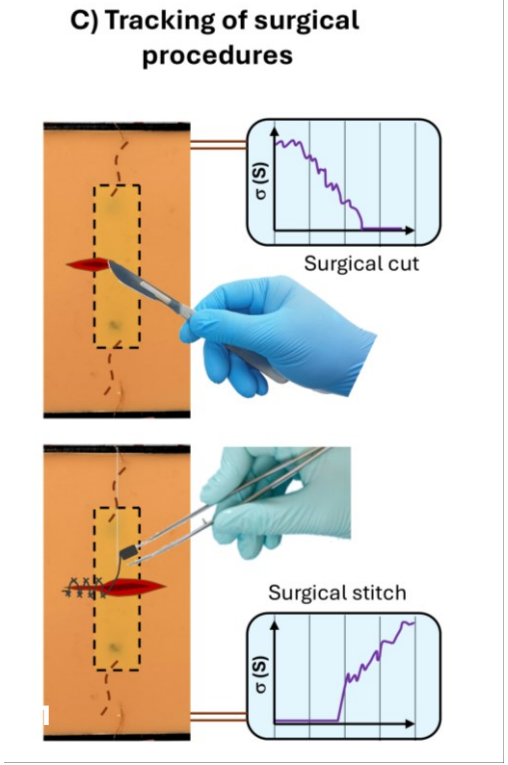
2) From passive to **ACTIVE phantoms**



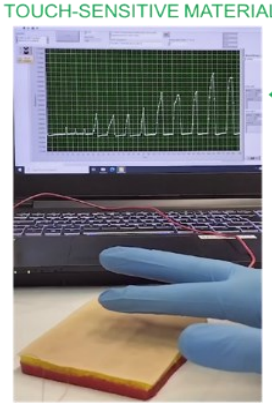
Collection of several tracks

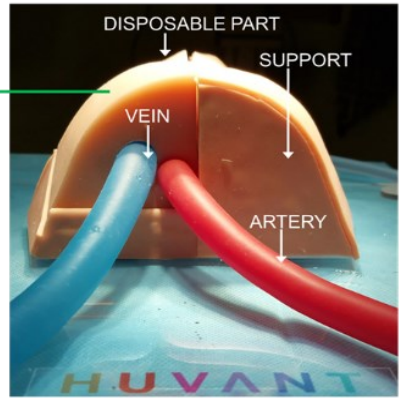
⇩

Comparison
Evaluation
Integration



ACTIVE HAPTIC SIMULATOR



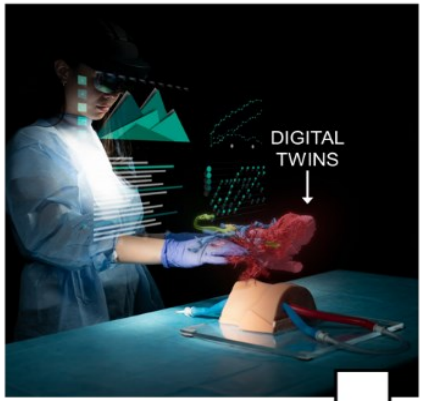


+

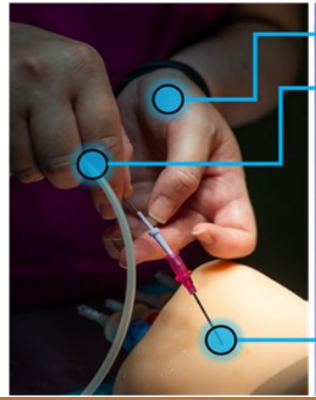
AUGMENTED REALITY (AR)

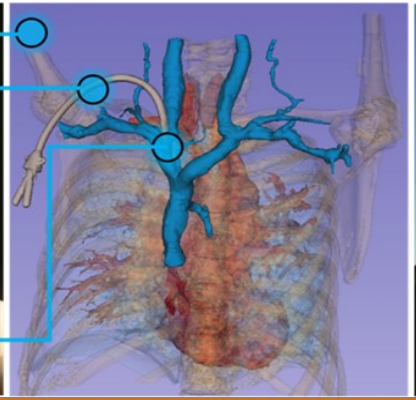
=

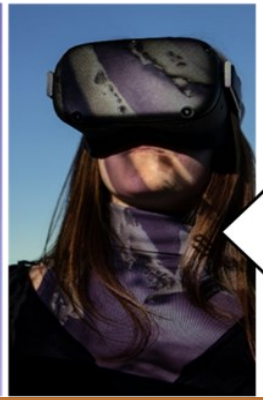
EXTENDED REALITY (XR)



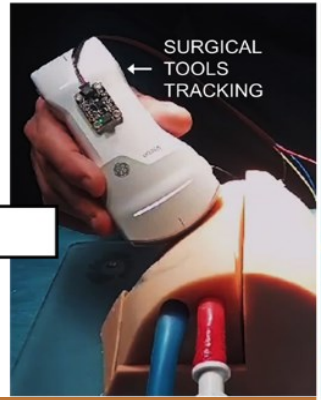
PROCEDURE VIRTUALIZATION and DATA RECORDING

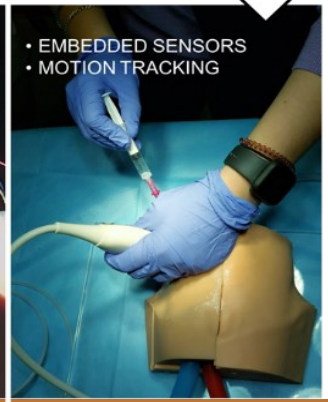






REAL-TIME TRACKING





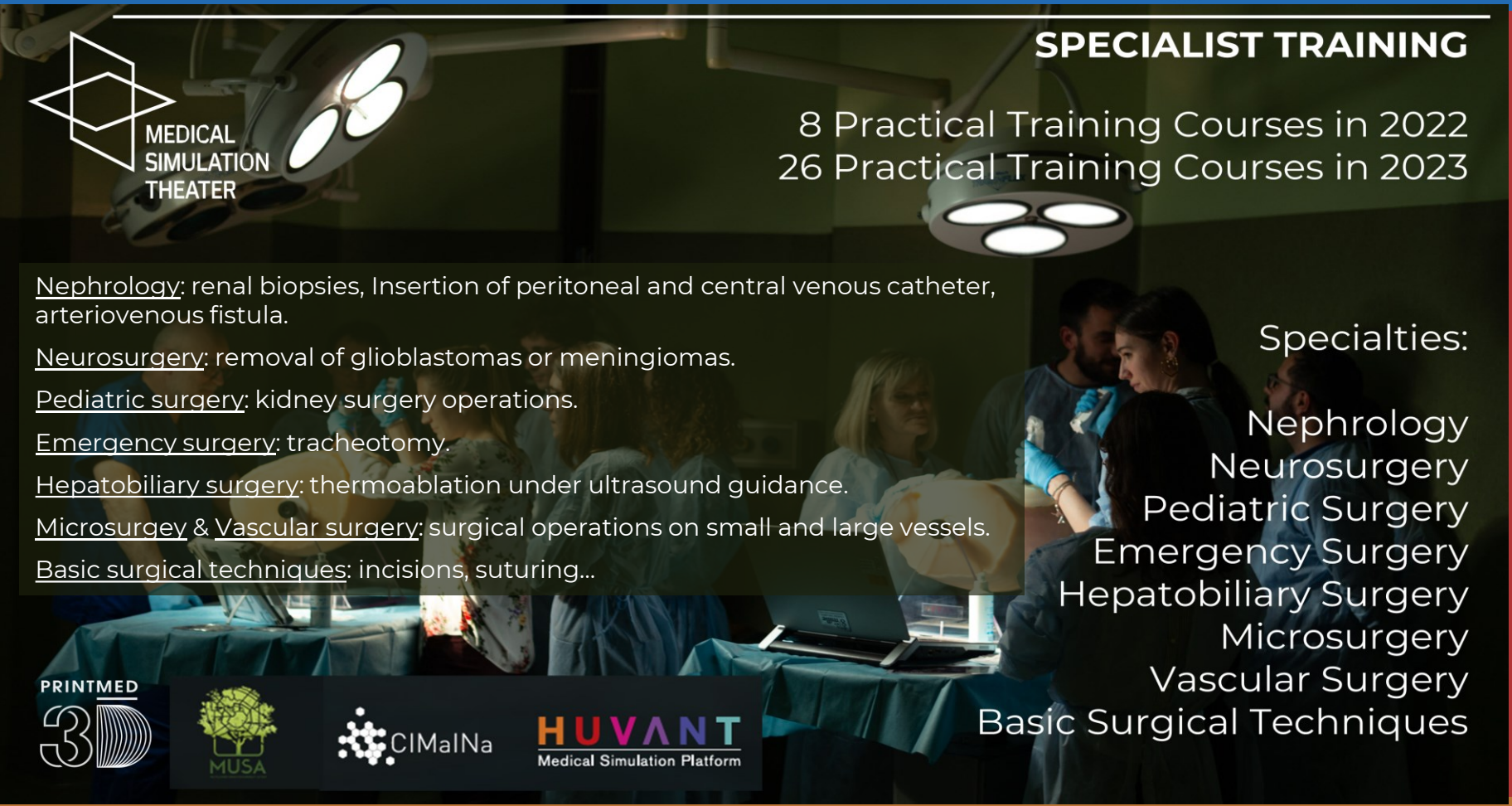
MUSA **Data**

Haptic and Virtual Models for Surgical Training and Personalized Medicine

Lorenzo Migliorini

SPOKE 2

Ernesto Damiani
Gian Vincenzo Zuccotti



MEDICAL SIMULATION THEATER

SPECIALIST TRAINING

8 Practical Training Courses in 2022
26 Practical Training Courses in 2023

Nephrology: renal biopsies, Insertion of peritoneal and central venous catheter, arteriovenous fistula.

Neurosurgery: removal of glioblastomas or meningiomas.

Pediatric surgery: kidney surgery operations.

Emergency surgery: tracheotomy.

Hepatobiliary surgery: thermoablation under ultrasound guidance.

Microsurgey & Vascular surgery: surgical operations on small and large vessels.

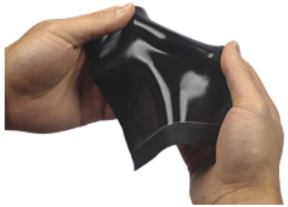
Basic surgical techniques: incisions, suturing...

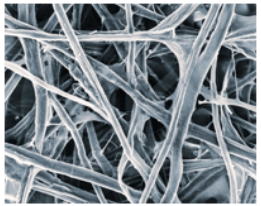
Specialties:

Nephrology
Neurosurgery
Pediatric Surgery
Emergency Surgery
Hepatobiliary Surgery
Microsurgery
Vascular Surgery
Basic Surgical Techniques

PRINTMED 3D
MUSA
CIMaINa
HUVANT Medical Simulation Platform

Strain and Temperature Soft Sensors





1

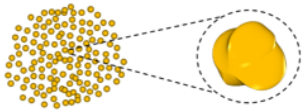
POLYMERIC MATERIALS
Soft mechanical properties
Stretchable, flexible, compliant

2a

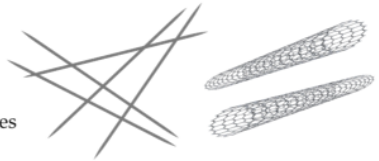
CONDUCTIVE NANOSPECIES
Electronic conduction

CONDUCTIVE NANOCOMPOSITES

0 D
Spheric NPs
Nanodots
Clusters



1 D
Nanoneedles
Nanowires
Carbon Nanotubes

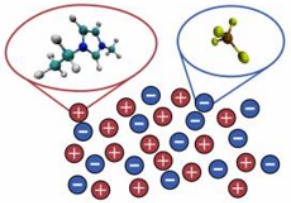


2 D
Nanoplates
Nanosheets
Graphene

3) LIQUID ELECTROLYTES: Ionic conduction

2b

CONDUCTIVE GELS



MUSA

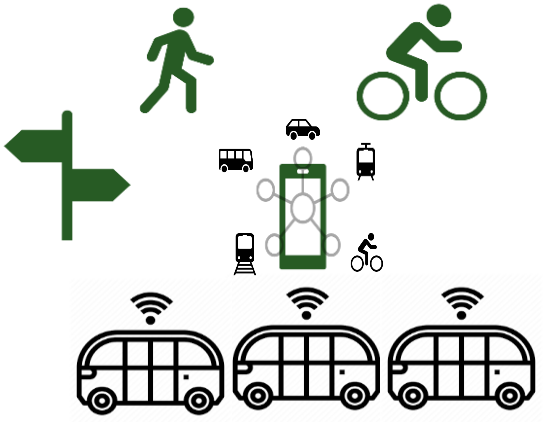
Towards a sustainable and inclusive mobility ecosystem

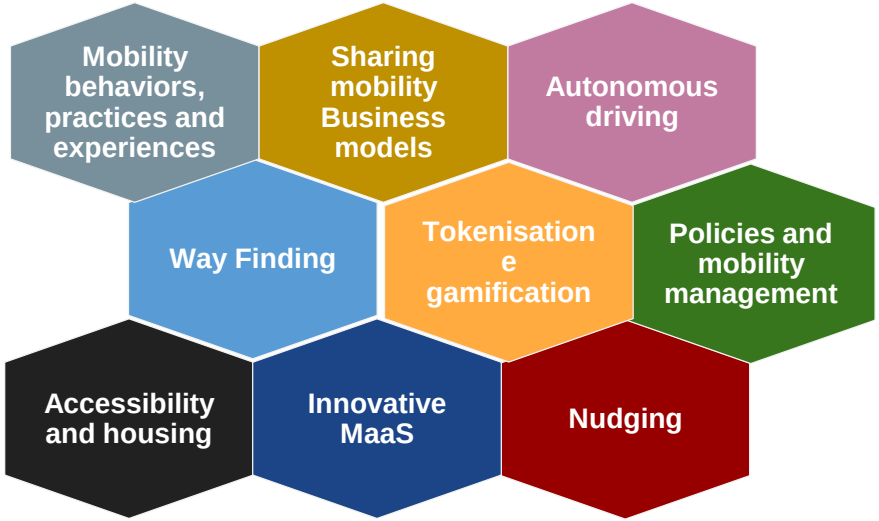
Tools and intervention strategies at the neighbourhood scale

Oscar Azzimonti
oscar.azzimonti@unimib.it

MUSA: sustainable mobility for urban regeneration

MUSA aims to develop and improve sustainable, active and inclusive mobility at the neighborhood level through research, educational, technological and infrastructural interventions, while providing new opportunities for socio-economic and territorial development.





A transdisciplinary effort

- 5 University Departments
- 1 district-based Company
- More than 10 district-based companies Mobility Managers
- Regional, municipal and district administrative bodies
- Students and citizens

UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

Department of Sociology and Social Research

Department of Informatics, Systems and Communication

Department of Business and Law

Department of Human Sciences for Education

Department of Psychology

Bocconi

PIRELLI

Comune di Milano

Regione Lombardia

MEET me TONIGHT

GENERAZIONI
Educazione Sostenibilità Giustizia Sociale

The district ID Card: a picture of Bicocca's mobility system

01.

Daily flows and district mobile populations

02.

Modal split

03.

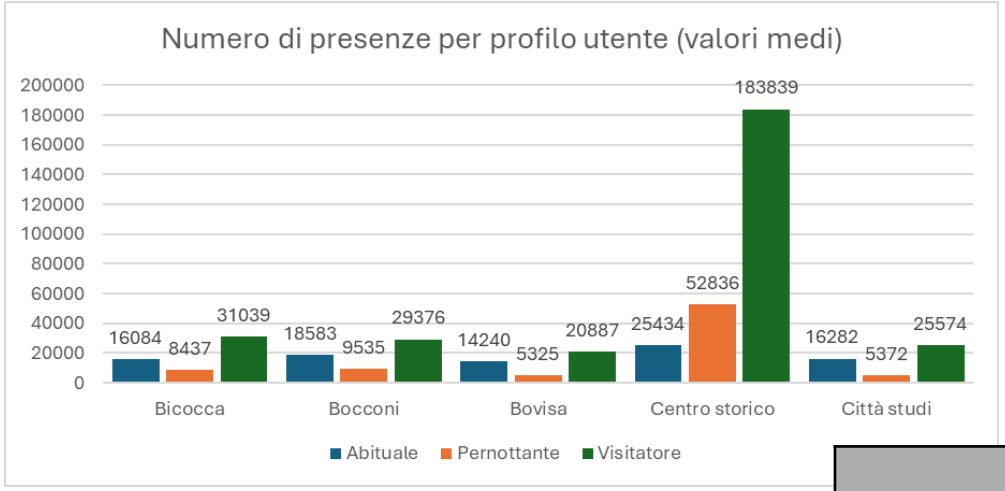
Vehicular traffic and safety in the neighborhood

04.

Mobility experiences in the neighbourhood

tomtom

How many people visit Bicocca every day?



Source: Vodafone Motion Analytica, 2023

- Bicocca is the university district with the highest number of daily visitors in Milan.

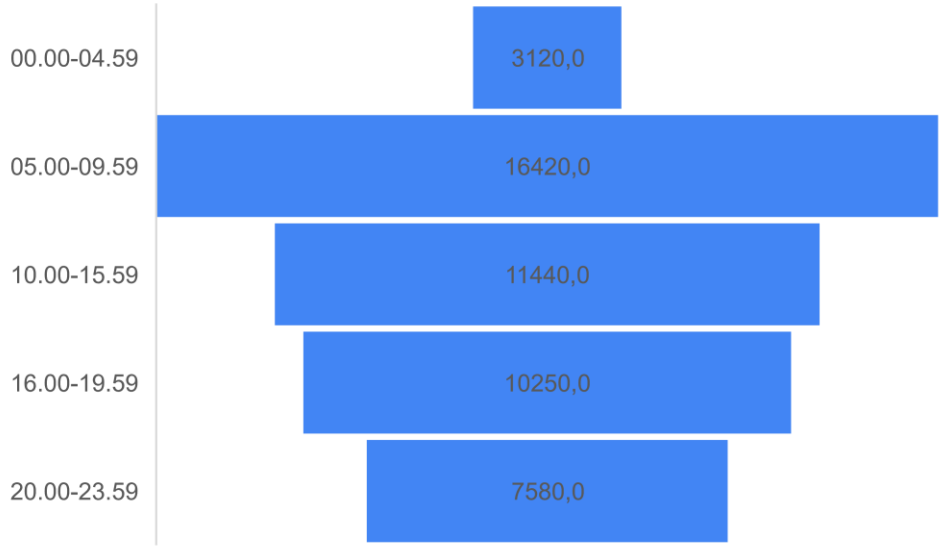
- Daily attendance in the district counts as twice as much than the number of residents.

Area	Visitors/residents	Overnight visitors/residents	Visitors+overnight visitors/residents
Bicocca	1.93	0.52	2.45
Bocconi	1.58	0.51	2.09
Bovisa	1.47	0.37	1.84
City center	7.23	2.08	9.31
Città studi	1.57	0.33	1.90
Milano	1.52	0.45	1.97

How many daily trips to Bicocca?

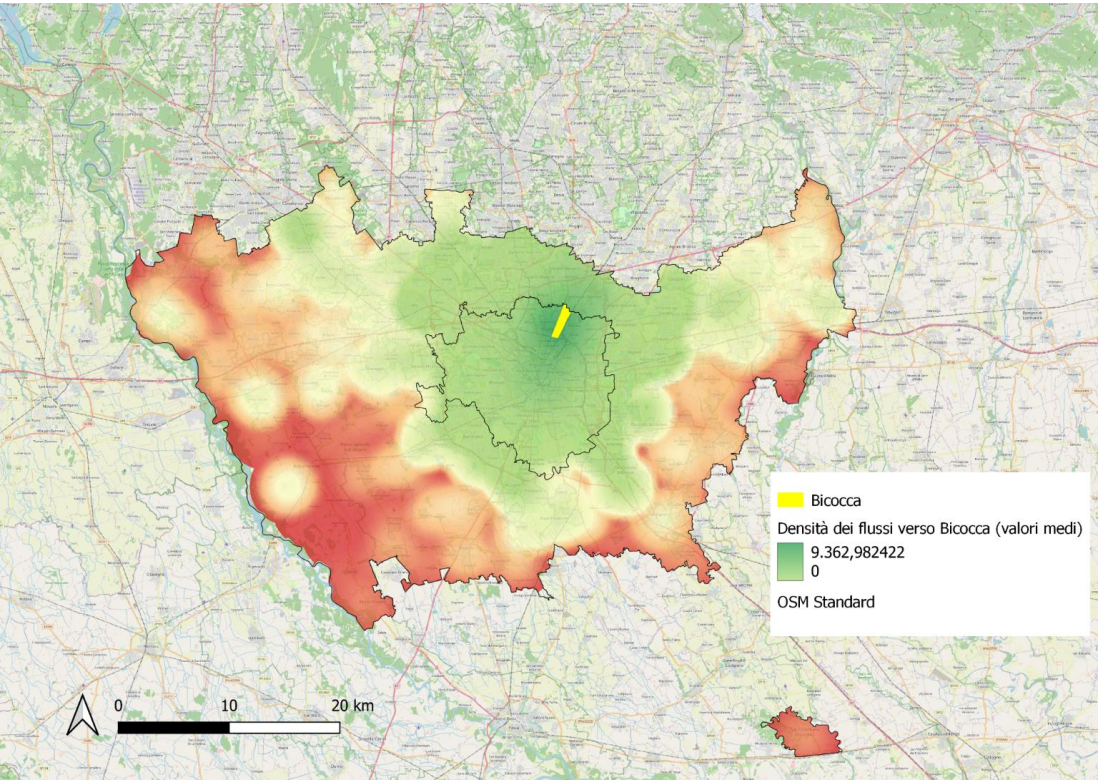
- The average number of daily trips to Bicocca on **weekdays** is **53,381**
- The average daily number of trips on public holidays on days to Bicocca is 38,256.

- The time slot in which trips to Bicocca are most numerous is from **05 to 09:59**: **16,400 trips, 20,700 during workdays.**



Source: Vodafone Motion Analytica, 2023

Where do these trips come from?



- The origin of the flows towards the Bicocca district is mainly located in the area north of Milan and the Metropolitan City.
- The density values of flows departing for Bicocca are higher in the neighboring municipalities (Sesto San Giovanni, Cinisello…), but remain high throughout the strip north of Milan from Rho (to the east) to Gorgonzola (to the west).

Source: Vodafone Motion Analytica, 2023

How is the experience of walking in Bicocca?

The walkability index offers a quantitative measure of an area's pedestrian-friendliness. It considers several factors that influence the quality of walking within the neighborhood, grouped in 4 key dimensions:

- **Quality of urban infrastructure,**
- **Comfort,**
- **Safety,**
- **Accessibility.**

«But it seems to me to be a neighborhood that is closed in on itself. (...)When you're here you walk, however it doesn't seem to me so much connected to other neighborhoods.»

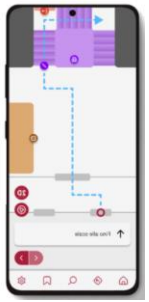
«Bicocca changes completely once the students leave and it becomes almost unlivable, especially on weekends... There have been multiple incidents where the police had to be called due to disruptive behavior around the Carrefour in Piazza Trivulziana.»

«I also find Bicocca very livable and beautiful just in a small area, however as soon as I get out of the university I am a little afraid to walk»

Conclusions: policies and innovative solutions for a better mobility

Mobility management and District Home-Work Travel Plan

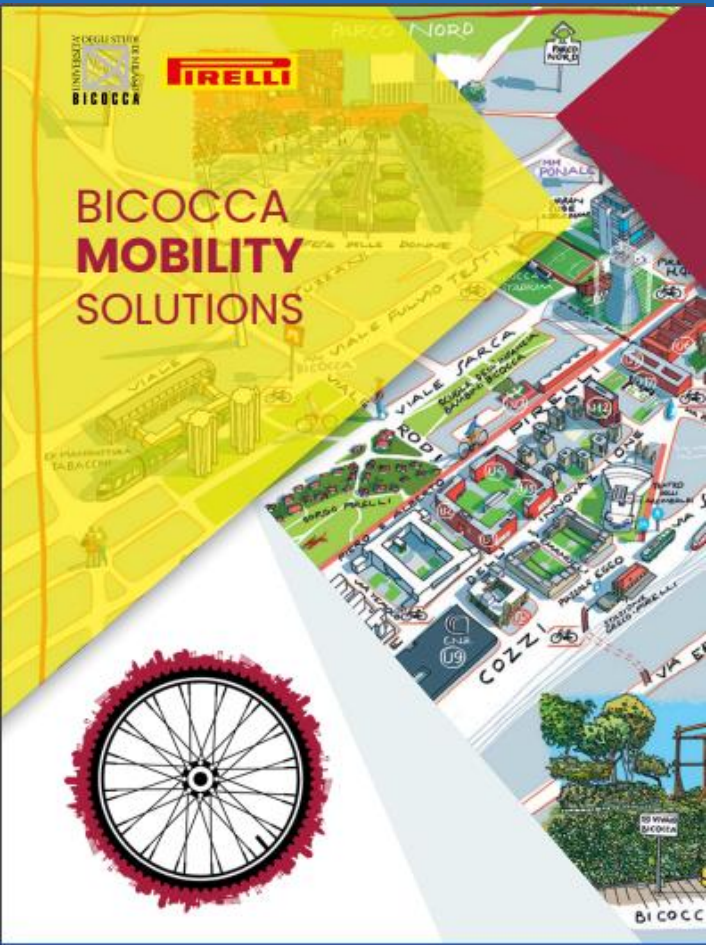
Neighbourhood Pedestrian Plan



Open access web application for routing and innovative accessible signage

Corporate bike-sharing service open to the neighborhood

University experimentation of nudge interventions to encourage sustainable mobility behaviors



- Accessibility and walkability analysis.
- Home to work/school/university mobility plans.
- Training activities on Mobility Management.
- Nudging techniques in the field of sustainability.
- Gamification solutions that contribute to the transition to the use of sustainable means of mobility.
- Sustainable mobility sharing services for the community.

Scan here for more info!

MUSA

Thank you!

Oscar Azzimonti
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University of Milan-Bicocca

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Finanziato dall'Unione europea NextGenerationEU
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UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA
UNIVERSITÀ DEGLI STUDI DI MILANO
FONDAZIONE BRUNO KESSLER
RCS MEDIAGROUP

Platform "FEL4School"

Financial Education Lab (FEL)

Alessia Sconti
Bocconi University

FEL FINANCIAL EDUCATION LAB: Mission

Il Financial Education Lab (FEL) si propone di promuovere l'educazione finanziaria come pilastro fondamentale dell'educazione civica, supportando le comunità, e in particolare le Scuole, ad accrescere la capacità di diffondere l'educazione finanziaria in autonomia, rendendo gli studenti consapevoli e capaci di affrontare le sfide economiche della società contemporanea.

QR code to get access FEL – Financial Education Lab

FEL FINANCIAL EDUCATION LAB: Objectives

Through an inclusive and collaborative approach, FEL aims to:

•Engage students, teachers, schools, businesses, and communities in the creation of accessible yet rigorous and high-quality educational materials.

•Provide tools and skills to support schools in financial education, empowering teachers to independently deliver the content.

•Promote financial education that has a tangible impact on families and communities, fostering economic and social well-being.

•Support the spread of financial literacy as a tool to reduce inequalities and strengthen the resilience of future generations.

FEL is committed to being a reference point in financial education, helping schools (transform) students into ambassadors of financial literacy for the benefit of all individuals, local communities, and our country.

FEL FINANCIAL EDUCATION LAB: project pillars

- **FEL e-learning**: the distance learning platform offering advanced courses for teachers and basic courses for everyone.
- **Forum:** events for debate and discussion with direct participation from students and the involvement. FEL experts, teachers, and Bocconi students
- **FEL Special Seminar:** in-depth seminars and dialogue with experts bridging the gap between schools and the outside world.
- **Finanza in ascolto:** a financial education podcast for everyone, covering current topics.
- **FEL Competition**: the Financial Education Games for high school students, who will compete in group challenges, with certificates awarded at the final FEL Forum.

FEL e-learning Platform X 2:

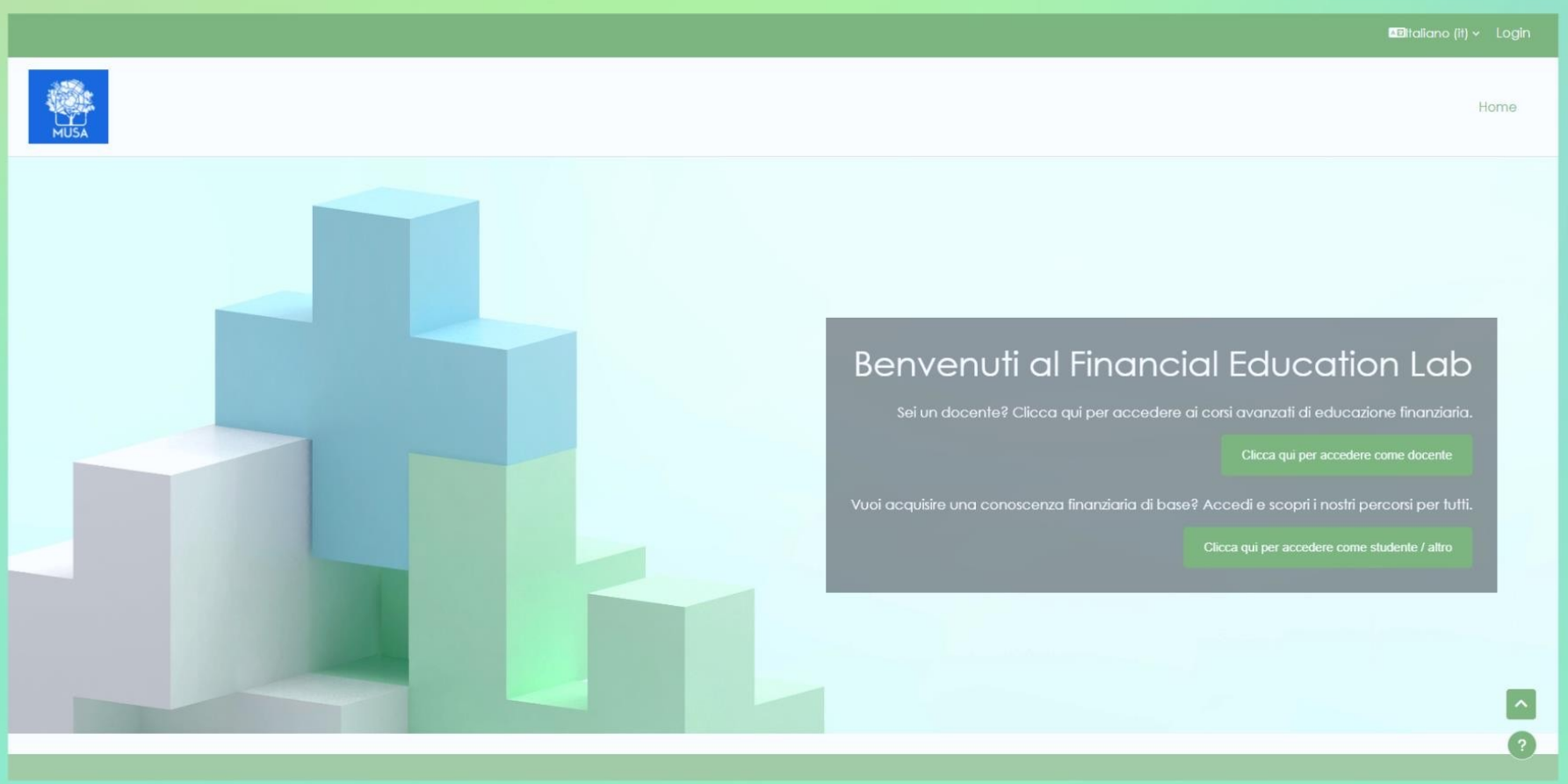
1 advanced course for teachers

1 course for students and everyone

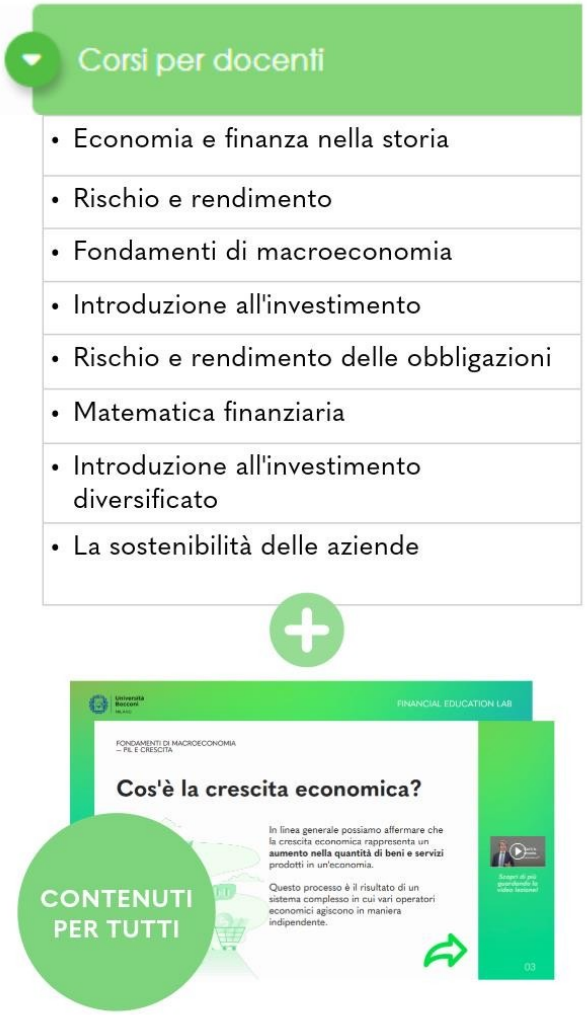
8 courses already available on the FEL-e-learning platform...

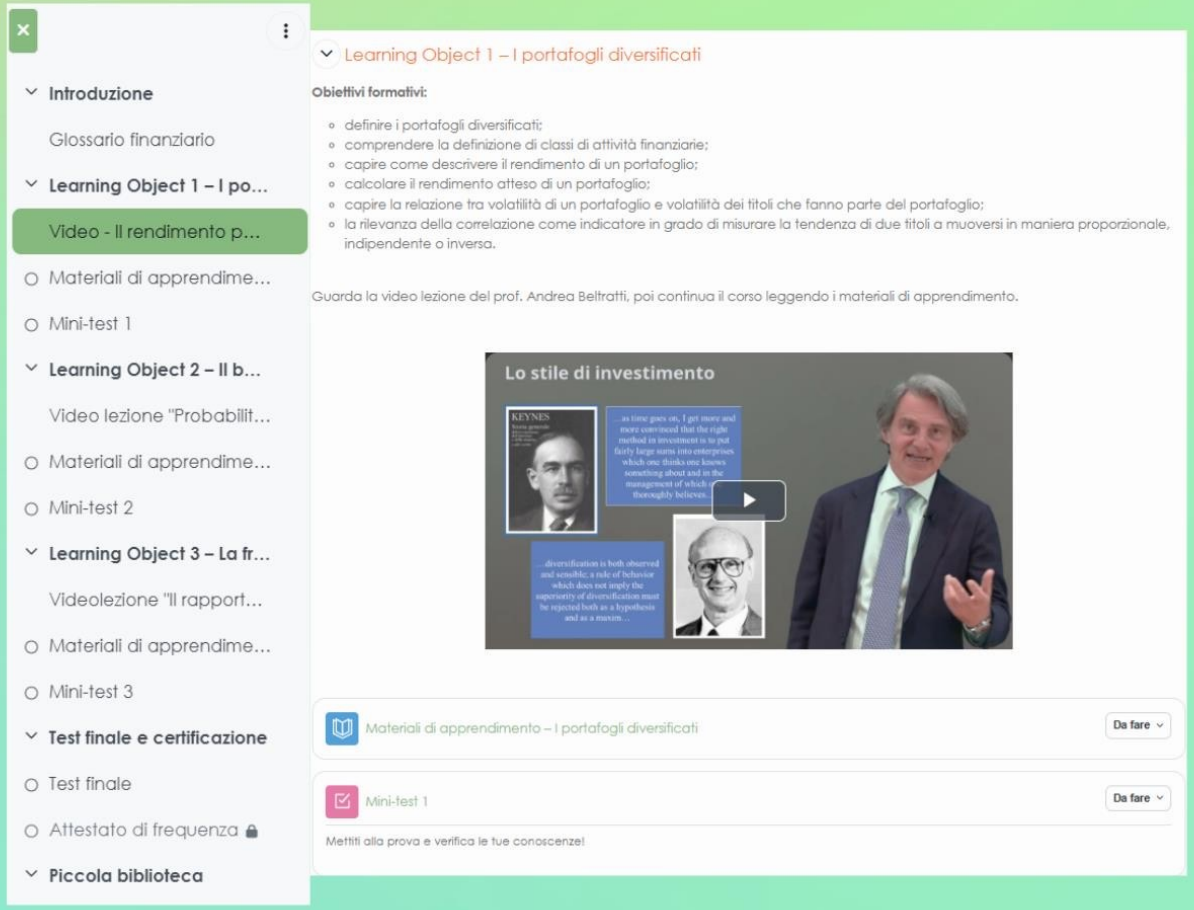
2 courses on Financial Planning and Bond Yields available in mid-December.

PIATTAFORMA FEL (EDUFINLAB.COM)



- ✓ Each course consists of a presentation, an essentia "building block" to establish a solid foundation in financial education.
- ✓ The interactive presentations include direct links to Edufin videos, which allow further exploration of the topics covered.
- ✓ Supplementary materials for deeper insights are available in the "Small Library" and the "Glossary," resources that are applicable across all the courses offered.





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Are investors willing to learn about sustainable finance? Experimental evidence from Italy

Joint work with Andrea Beltratti, Alessia Bezzecchi e Francesco Saita

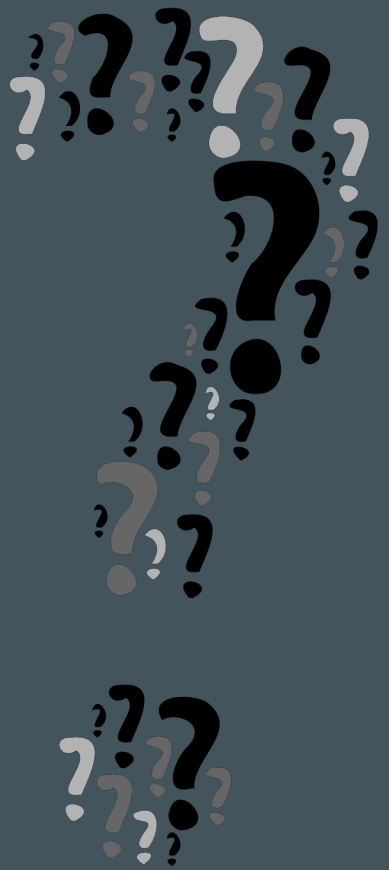
Alessia Sconti
Bocconi University

About 1 in 2 Italian householders had never heard about ESG (BVA Doxa, 2022)

While people should know more, we also need to provide the tools...

Research Questions

- does a short human video motivate people to acquire more information?
- does a short AI video motivate people to acquire more information?
- Is there more tendency for value investors to watch RRESG and for valueS people to watch ESGSUST?
- Is there cross interest that is value people watch ESGSUST and valueS people watch RRESG first?
- How are previous issues affected by financial literacy?



Motivation

A growing body of literature on financial literacy suggests that financial education works and is economically beneficial (Kaiser et al., 2022), but much less is known about how to provide **sustainable financial literacy** or its effects on behavior.

Bloomberg data suggests that global investments in ESG ETFs have grown exponentially: they amounted to $600 billion in 2023, compared to $100 billion in 2019.

In 2022, the MiFID II questionnaire introduced mandatory questions about investors' ESG preferences, emphasizing the importance of this specific knowledge for making informed financial decisions.

Our contribution

In this paper, we aim to contribute to the literature by examining the differential impact of being exposed to a **short video** in which the instructor is a human versus one guided by artificial intelligence in motivating people to acquire more information and the role of financial literacy.

Research design*

Representative sample (n=8000)

Stratified randomization of individuals by gender, age, region (central, northeast, northwest, southern Italy + islands), investors type (no investors, investors)

Control group (n=2666)

Treatment group (n=5334)

Chat-GPT video (n=2667)

Bocconi Professor video (n=2667)

*Pre-registered

Finanziato dall'Unione europea NextGenerationEU
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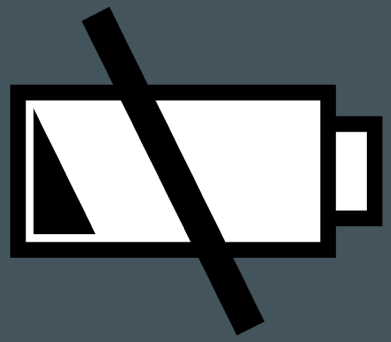
Università Bocconi MILANO

Expected results



Low ESG literacy

Higher ESG literacy

women, financially literate, investors, those with higher climate change awareness, and younger individuals.

We expect treated individuals to be more willing to click on links to additional sustainable finance resources, compared to the control group, with heterogenous effects for gender, social background and financial knowledge.

It may be a cost-effective intervention to inform researchers and policymakers.

Finanziato dall'Unione europea
NextGenerationEU

Ministero dell'Università e della Ricerca

Italiadomani
PIANO NAZIONALE DI RIPRESA E RESILIENZA

MUSA

Università Bocconi
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Thank you for your attention!

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Social and Migratory Transitions. The Role of the University in the Experience of Legal Clinics

Ludovica Oliva

BOCCONI LEGAL CLINICS

In 2019, the **Bocconi University School of Law** launched the legal clinics project to offer to the community its legal resources and expertise:

- **Rights and Vulnerability**: legal desk in the heart of the San Siro/Selinunte neighborhood
- **UASI (Ukraine – Support and Information)**: provides legal advice to refugees (Ukrainian and not), NGOs and Italian institutions dealing with asylum access
- **Rights in Prison**: legal desks at Bollate and San Vittore prisons
- **(B4I - Startup and Innovation**: legal support desk for innovative startups in collaboration with law firms)
- **(Tradelab - Global trade and investment rules**: provides legal advice to government agencies, NGOs, SMEs on issue related to international trade law - in English)

LEGAL CLINICS PROJECT

- An experimental **academic course** designed to offer assistance on legal matters through legal desks, directly accessible to those seeking support
- **Commitment** for students of one semester or one year
- Open to **Law students** and **LLM European Business and Social Law**
- **Selection process**
- **Recognition** of 6 **credits** as optional activity
- Valuable experience for **students:** engaging method of **learning by doing**, **real cases**, from law in books to law in actions

LEGAL CLINICS PROJECT

- Valuable vehicle for recognizing and accessing rights within territorial contexts characterized by **structural** vulnerability and marginalization (prison or fragile neighborhoods in Milan) or **functional** vulnerability intrinsic to immigrant status

- **Multidisciplinary** approach

- **Specific training**: Bocconi professors, ASGI, EMDR Association

- Acquisition of ***soft skills***: direct interaction with individuals seeking support, often in extremely vulnerable conditions (prisoners, migrants, minors, abused women, etc.)

- **Network and relationships with professionals**: law firms (Lexia, Bacab), lawyers (Margherita Calvi, Luisa Francioli), prison staff (educators, psychologists)

- **Advocacy**: Consulates, Milan Municipality, Lombardy Region, *ATS Lombardia*, *Aler Milano*, schools, *Polostart*, *Questura* and *Prefettura*, *WeMi*, *CPIA*, *Capac*, *Garante dei detenuti*, *Uepe*

LEGAL CLINICS AND THIRD MISSION

Full compliance with the **Third Mission** of the University and **social responsibility**:

- University activities for the benefit of **students** and the **community**
- Promotion of **social cohesion**
- **Support** and **orientation** of vulnerable individuals
- Education and awareness-raising for students involved in **social responsibility**
- Field enhancement of **teaching** and **research** products
- **Interaction** with the local **community** and making the University's resources and expertise available to the community

A.Y.	APPLICATIONS RECEIVED	STUDENTS ADMITTED	PARTICIPATING STUDENTS
2023 – 2024	167 + 26 master	71 + 11 master	71 + 11 master
2022 – 2023	166	81	81
2021 – 2022	114	54	54
2020 – 2021	141	40	40
2019 – 2020	59	34	34

A.Y. 2023 – 2024	APPLICATIONS RECEIVED	STUDENTS ADMITTED	PARTICIPATING STUDENTS
Rights in Prison	63 + 1 master	18	18
Rights and Vulnerabilities	19	16	16
UASI	13	12	9

RIGHTS AND VULNERABILITIES CLINIC

San Siro district – the context:

- Place run by the Milan Politecnico in the heart of a public housing complex
- Relatively central position but regarded as a kind of **inner-city suburb**
- **Marginalization** and **negative stigma**
- Tough life conditions (the elderly often living alone, people with mental health problems, unemployment and families at risk of poverty)

The context and the nature of ***street law clinic*** encourage **action-research**, direct student **involvement**, and ***advocacy***

RIGHTS AND VULNERABILITIES CLINIC

<u>Rights and Vulnerabilities Clinic:</u>

Active from November 2019
Open every **Thursday** (9.30 - 17.30) at Spazio Off Campus San Siro located at Via Gigante 5
→ **street law clinic**

Team: Professor Melissa Miedico, Professor Paola Mariani, Maria Dellagiacoma, Ludovica Oliva, Lucia Ventura

Collaboration: Milan Politecnico, Statale and Bicocca Universities, Progetto Qubì, COOPI

Students (2019 – November 2024): 85

Duration: 12 months

RIGHTS AND VULNERABILITIES CLINIC

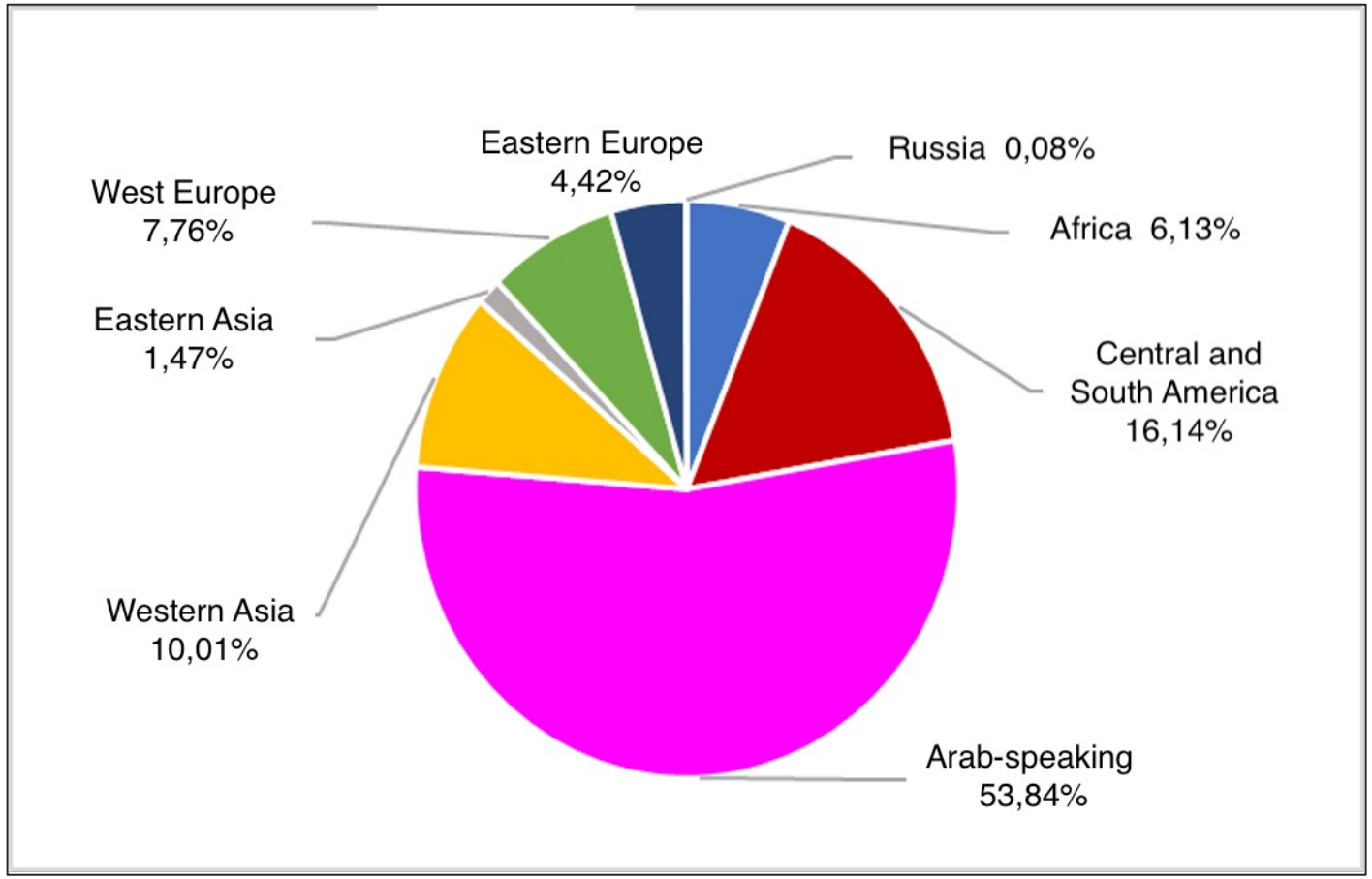
Activities:

- **Interviews** with spontaneously accessing persons
- **Study** and **research** of the legal issue, drafting acts, petitions, opinions
- Weekly **reunion** with students

Subjects covered:

- Immigration law
- Criminal law
- Criminal law procedure
- Family law
- Civil law

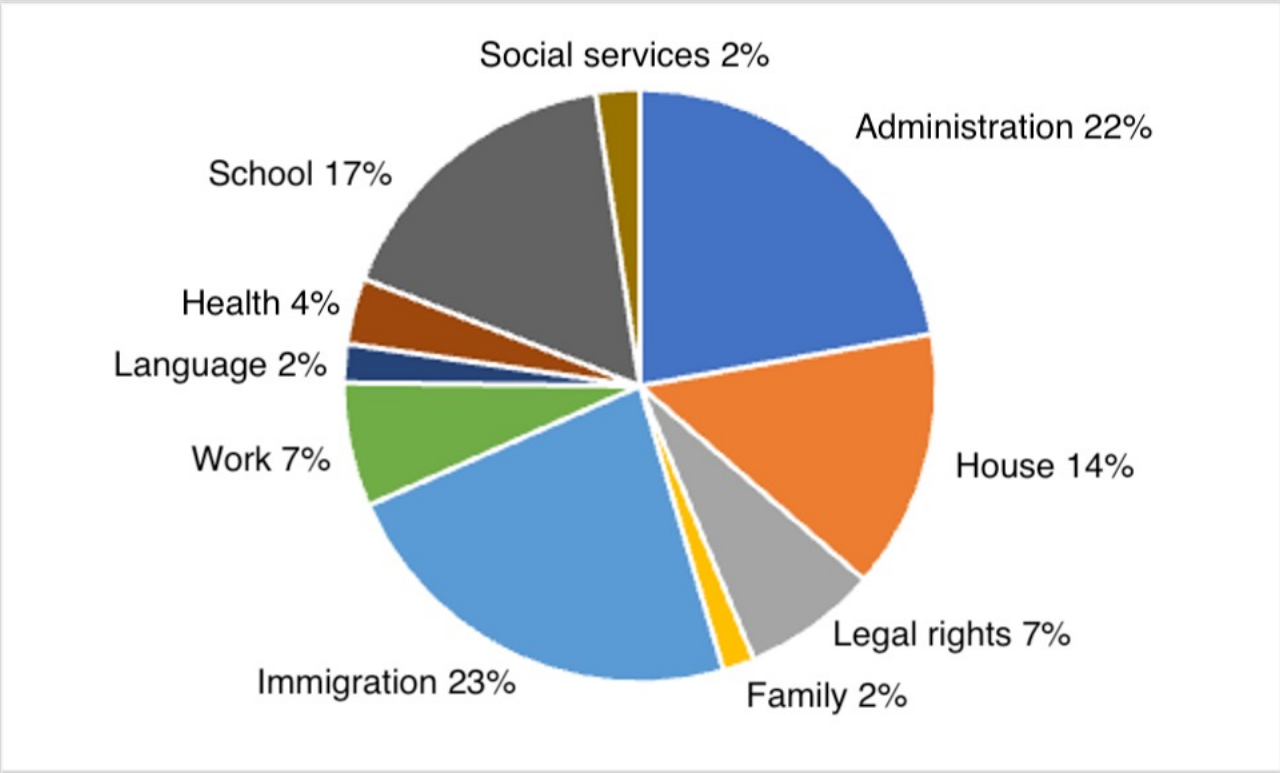
RIGHTS AND VULNERABILITIES CLINIC



Country	%Tot
Egypt	31%
Morocco	15%
Peru	10%
Sri Lanka	9,7%
Italy	7,4%
Senegal	2,5%
Nigeria	2,3%
Tunisia	2%
El Salvador	1,7%
Romania	1,6%
Ukraine	1,5%
Ecuador	1,3%
Philippines	1,2%

The demographic composition of the neighborhood impacts the most frequently discussed topics and the issues presented by those accessing the clinic

From Nov 2019 to Nov 2024 #640 people supported with #1,391 individual accesses



In their clinical experience, students learn that even issues that, at first sight, unrelated to law in a strict sense are inherently tied to access to justice and the recognition of applicants' rights

LEGAL CLINICS AS A TRANSFORMATIVE AND COMMUNITY CAPACITY BUILDING TOOL

FAMI Project (2023)
Bocconi, Politecnico, and Bicocca Universities
+ Prefettura di Milano and partner three Third Sector entities

Project's goals:

- To develop a **model of active citizenship** within the San Siro neighbourhood through **innovative intervention paths**
- To enhance the **intervention capacity** of public and private entities, professionally active in the area, to analyse and intervene in territorial dynamics (**capacity building**)

LEGAL CLINICS AS A TRANSFORMATIVE AND COMMUNITY CAPACITY BUILDING TOOL

A selected group of women residents was actively involved in a pilot project designed to impart skills on basic legal issues related to **access to rights**, targeting individuals identified as potential leaders and community mediators (**community leader**)

<u>Twofold purpose:</u>

- Enable them to **assist residents** by directing them towards the relevant resources and services
- **Dialogue with institutions and bodies,** by taking on the role of community mediators

THE PILOT PROJECT

I. Identification of **target group** and **selection process**: 11 women involed

II. The **training sessions** (9 meetings):
- **Empowerment**, building leadership, community managament and community engagement tools (e.g. using a whatsapp group for sharing)
- Discussion of **relevant topics**
- Involvement of institutional and association rapresentatives
- Creation of a **guide for community mediators**

UASI LEGAL CLINIC

Legal clinic run by **BLEST** (the Bocconi Lab for European Studies)
Active from March 2022

Team: Professor Eleanor Spaventa, Professor Paola Mariani, Marco Gerbaudo, Ludovica Oliva, a social media manager and a translator for Ukrainian and Russian languages

Collaboration: NGO Intersos, Coordinamento Ucraino Italia Association, ASGI

Students (March 2022 – November 2024): 25

Duration: 12 months

Website and social network (Facebook, Instagram, Linkedin, X)

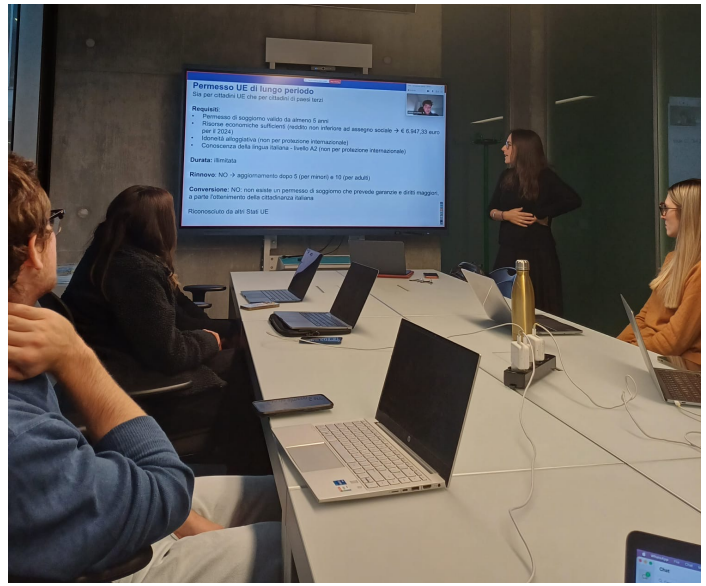
UASI LEGAL CLINIC

Activities:

- **Information guides** and **blogposts**
- **Training** and **legal desks**
- Collaboration with **lawyers** (e.g. drafting appeals, legal research, preparing applicants for interviews for international protection)
- Internal **training** on immigration law issues
- Bi-weekly **reunions** with students

Subjects covered:

- Immigration law
- EU law
- International law
- Administrative law



UASI LEGAL CLINIC

16 Information guides translated in Italian, Ukrainian and Russian:

- Temporary Protection
- Arrival in Italy
- Documents
- Minors
- First Reception: where to eat and sleep
- Women Victims of Violence
- Support and Financial Inclusion
- Services and Language Courses
- Health
- Work and Employment
- Education
- Recognition of Foreign Diplomas in Italy
- Housing
- Forms of Protection and Residence Permits In italy
- Psychological support
- Residence

UASI LEGAL CLINIC

4 Blogpost translated in Italian, Ukrainian and Russian:

- When a deadline can limit a right: the issue of travel with Temporary Protection
- A year of UASI
- A year of war in Ukraine
- Russia's Mobilization - How the call to arms is causing a new migration flow

16 Training and Legal Desks

NETWORK AND MAIN EVENTS

- 23/24 November 2023: participation to the **National Legal Clinics Conference** at University of Turin
- January and February 2024: four meetings with **EMDR Association Italy**
- 12 March 2024: **visit** to the the legal clinics (San Vittore, San Siro and Bollate) by the Rector and board of Bocconi University, the Rector of the Bicocca University, and the Rector and Board of Politecnico
- 22/24 July 2024: participation at Amsterdam Law School to the **annual international conference** of ENCLE and IJCLE