Christos Grapas

Academic Portfolio

A.D. 1308
unipg
UNIVERSITÀ DEGLI STUDI
DI PERUGIA

An Overview

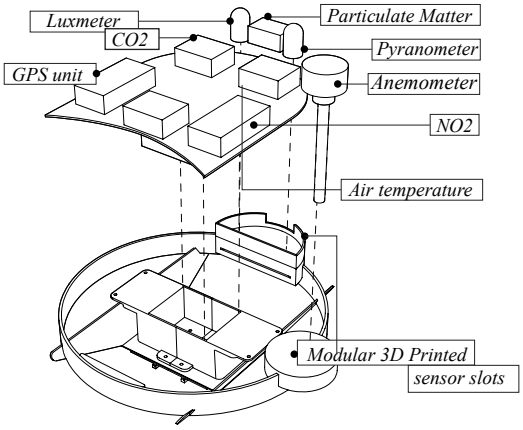
Experimental Monitoring of Transitional Spaces, 2024, Trastevere, Rome, Italy

Christos Grapas is an architect and Marie Skłodowska-Curie early stage researcher completing his PhD through the European "MuSIC" project at the University of Perugia's Environmental Applied Physics Laboratory under the supervision of Professor Anna Laura Pisello. He holds a degree in Architectural Engineering from the National Technical University of Athens and completed postgraduate studies at the Oslo School of Architecture and Design and IAAC Barcelona with industrial scholarship awarded. Previously, he worked as an architectural designer in Austria and Greece, with additional contributions to stage design. His experience includes a position at Coop Himmelb(l)au in Vienna, where he contributed to major projects in Azerbaijan, China, Russia, and Austria.

Vision

Experimenting with More-than-Human Monitoring , 2025, Perugia, Italy (Pilot Design by the Author)

The most urgent architectural questions today are empirical, yet answering them properly requires designers who can move between laboratories and the field without losing design sensitivity in translation. Science and technology should not reduce architecture to data, but make the conversation between measurement and atmosphere honest. Wearable sensing, environmental monitoring, and spatial analytics are not ends in themselves: they are tools for validating what designed space actually does to human bodies, not just how it looks, but how it feels. The goal is to move from diagnostic capacity into locating stress to design capacity: demonstrating that we can design through it.



Goals

An architect, a researcher, an urban technologist, an occasional designer but above all someone who genuinely wants to teach.

Studies & Qualifications

Bachelors & Master's Degree (2014 – 2021)

Architectural Engineering
National Technical University of Athens (NTUA)
Athens, Greece

Grade 9.13 · Ranked 9th out of 150

Master's Degree (2022 – 2023)

Master in City and Technology, Institute for *Advanced Architecture of Catalonia (IaaC)*, *Barcelona, Spain*

Industrial Fellowship · Graduated with Honours

Study Abroad (2018 – 2019)

Oslo School of Architecture and Design (AHO), *Oslo, Norway*

PhD (2023 – 2026)

PhD in Energy and Sustainable Development, University of Perugia

- MSCA Actions, MuSIC Network
- Research Network:

1. RWTH Aachen – Healthy Living Spaces. Supervised by Marcel Schweiker.
2. UCLouvain – Landscape Architecture & Built Environment. Supervised by Maider Llaguno-Munitxa.

Languages

Greek - Native Speaker
English - C2
Italian - B1
German - A1

MuSIC Project

MuSIC (Multisensory Interactions in urban Contexts) is a Marie Skłodowska-Curie Doctoral Network funded by the European Union's Horizon Europe programme. Addressing the gap between single-domain comfort approaches and the multisensory reality of human experience, MuSIC trains early-stage researchers across human physiology, perception, passive building strategies, and self-sensing technologies with the ultimate goal of providing future generations with more liveable and sustainable urban spaces.

Individual Research Project Title:

Human Perception in Outdoor and Transitional Urban Spaces

Duration: 2023 – 2026.

Host Institution: *University of Perugia, Environmental Applied Physics Laboratory (EAPLAB), Italy*

Abstract

Are we designing cities for bodies that don't exist? Urban climate adaptation has long relied on population-averaged thermal models, frameworks built on demographic abstractions rather than the physiological reality of individual humans navigating real streets, under different conditions of time, safety, noise, and air quality. Across three studies, the work builds toward a multisensory human-centred toolset. The first introduces Multisensory Urban Climate Zones (MUCZ), showing that human-driven factors influence outdoor comfort as much as urban morphology. The second reveals that integrated multi-domain models explain up to 43% of physiological stress variance that thermal indices alone miss, and that demographically similar individuals respond to identical microclimates differently. The third introduces urban chronotypes, showing that cooling infrastructure in unsafe areas fails to produce protective behaviour despite intact physiological heat sensing. Together, these studies offer a toolset for validating whether built environment interventions actually reduce stress for the people inhabiting them, moving adaptation toward cities that are experienced, not merely modelled.

Supervisors:

Main: *Prof. Anna Laura Pisello (University of Perugia)*
Co-supervisor: *Ilaria Pigliautile University of Perugia)*
Co-supervisor: *Prof. Marcel Schweiker (RWTH Aachen)*
Co-supervisor: *Dr. Maider Llaguno-Munitxa (UCLouvain)*

Academic Experience

Marie Skłodowska-Curie Doctoral Fellow
Italy, 2023 – 2026
University of Perugia, EAPLAB

Visiting Researcher
Germany, Nov 2024 – Dec 2024
RWTH Aachen, Healthy Living Spaces Lab, supervised by Prof. Marcel Schweiker

Visiting Researcher
Belgium, March 2025 – June 2025
UCLouvain, Landscape Architecture and Built Environment, supervised by Dr. Maider Llaguno-Munitxa

Awards & Distinctions

Marie Curie Debates Winner, Italian Researcher's Night,
2025
Volkswagen Foundation Travel Grant Recipient , International Urban Health Summit,
2025
Inaugural Address representing international doctoral students, University of Perugia, 718th Academic Year Ceremony
2026

Conference Participation

MindBrainBody Symposium, Max Planck School of Cognition
2026, Berlin, Germany

NECTAR Conference '26 Planning for Urban Mobility Transitions in Times of Uncertainty
Technical University of Munich (Pending)
2026, Munich, Germany

52nd National Conference of the Italian Acoustics Association
Perugia, Italy

7th International Conference on Countermeasures to Urban Heat Islands (IC2UHI), Nanjing, China
2026, Nanjing, China

CATE Conference, Comfort at the Extremes
2026, Tucson, Arizona

Practice

Junior Architect, Coop Himmelb(l)au,
Vienna, Austria, 2019 – 2021

Digital fabrication, parametric modelling, interior design, landscape design, visualization and animation across 16 major international projects

Projects included: *Central Bank of Azerbaijan, Science and Technology Museums (Xingtai, Kunshan), International Finance Forum Guangzhou, Qiddiya Arts Complex, Huanggang Port Shenzhen, International Airport Hefei, City Park Graz, Schloss Arenberg Salzburg, Brancusi Museum Romania, Wien Holding Arena, Schillerpark Linz, Museum and Theatre Complex Kemerovo, Sports and Concert Complex Peterburgsky*

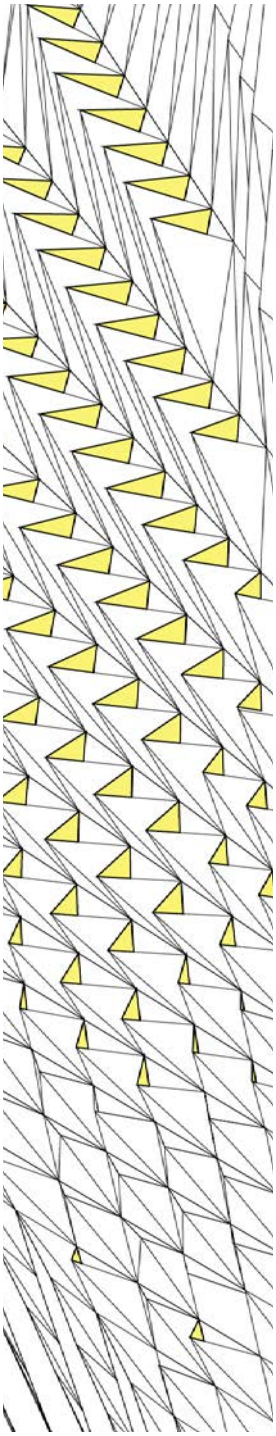
Seminars

Urban Physics Autumn School 2025, *An International Specialised Workshop for PhD students, postdocs and young academic staff.*

October 2025, Golem, Albania
Organisers: Prof. Bert BlockenHeriot-Watt University, UK Prof. Jan Carmeliet
ETH Zurich, Switzerland, Prof. Dominique Derome, Université de Sherbrooke, Canada Prof. Alessio Ricci, IUSS Pavia, Italy

Equipment & Software

Experienced in **deploying synchronized wearable sensing systems** for **physiological and environmental monitoring**, including EDA, heart rate, eye-tracking, CO2, particulate matter, light dosimetry, and acoustic recording across real urban field conditions. Proficient in the full pipeline from data collection to spatial analysis and design visualization, working across **Python, GIS** platforms, parametric design tools (**Grasshopper**), **environmental simulation** software.

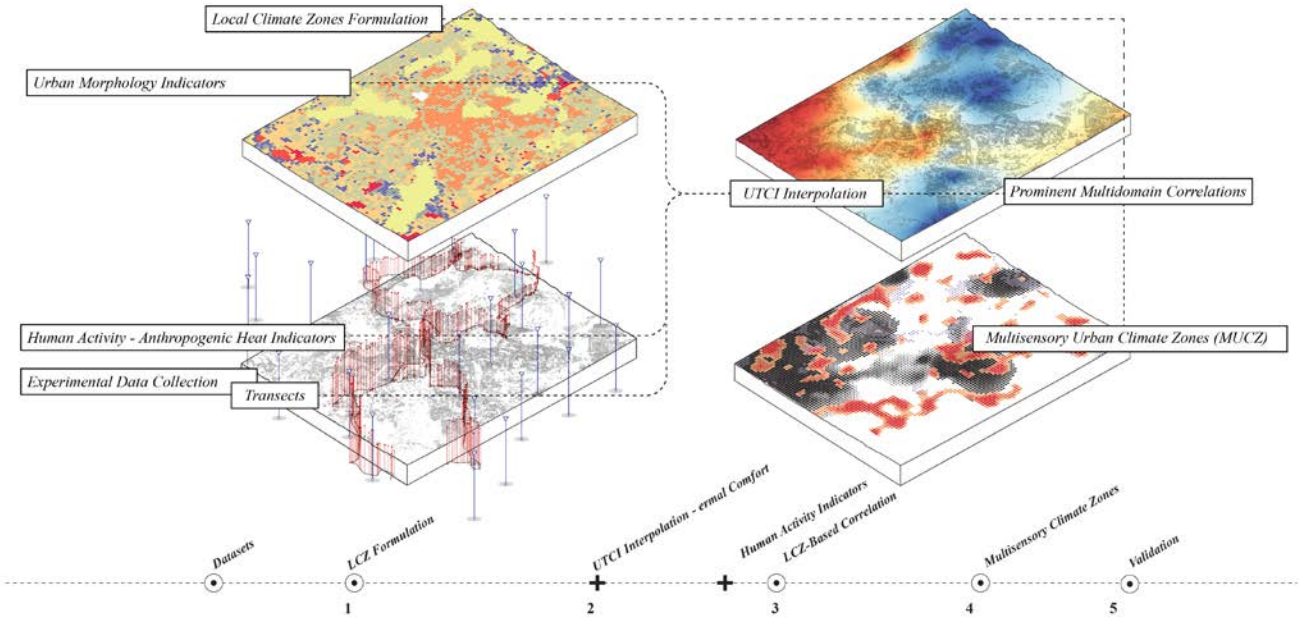


Preliminary design study: parametric slat aperture with gold-angled inner surfaces modulating directional daylight reflection into interior space, Figure by the Author, 2021.

Publication A

25'
EAPLAB

- **Multisensory Urban Climate Zones (MUCZ): A Framework for Mapping Dynamic Multidomain Human Comfort in Complex Urban Fabrics beyond Urban Morphology.**
  Grapas, C., Pisello, A.L., Pigliautile, I., Guattari, C., & De Cristo, E. (2025). Sustainable Cities and Society, 106673. DOI: 10.1016/j.scs.2025.106673



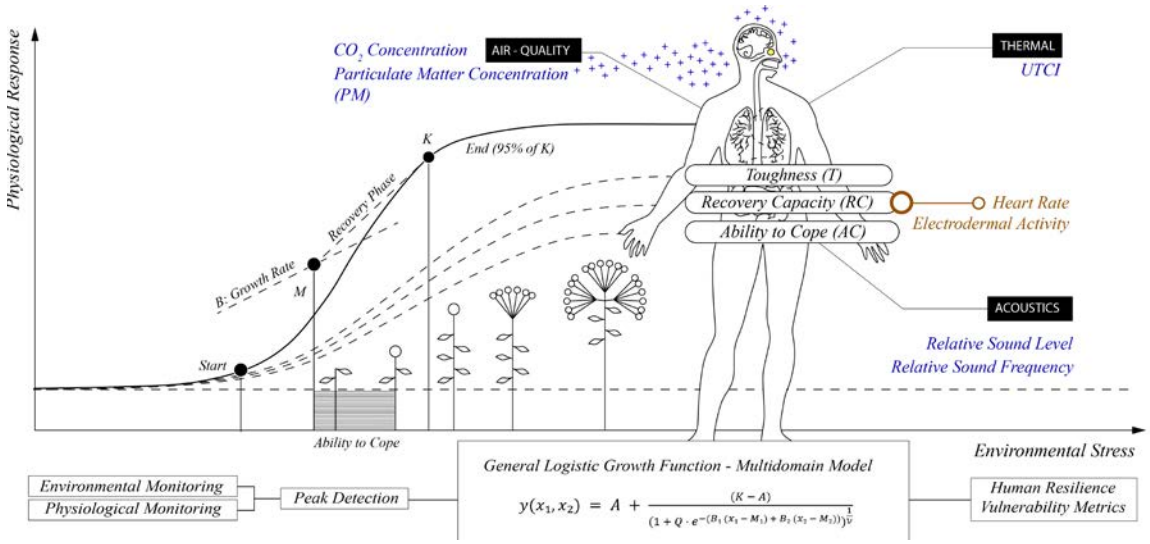
Highlights

Urban areas look very different at 10am versus 5pm — and our comfort frameworks rarely reflect that. Traditional urban climate mapping relies on fixed physical parameters like building height and land cover, missing the dynamic role of human activity. This study introduces Multisensory Urban Climate Zones (MUCZ), a framework that layers real-time air quality, ecological connectivity, and thermal conditions onto existing urban climate maps. Where air pollution and thermal stress converge (correlation r=0.55 in dense urban areas), the framework identifies priority zones for targeted intervention. The result is a mapping tool that captures not just how a city is built, but how it is used — and how that use shapes the comfort of the people moving through it.

Publication B

26'
EAPLAB

- **Do We All Feel the City the Same Way? A Proof-of-Concept Framework Linking Physiological Wellbeing to Neighborhood-Scale Resilience Through Multi-Domain Environmental Sensing**
  Grapas, C., Schweiker, M., Pisello, A.L., Pigliautile, I., Jacoby Cureau, R., (2026). *Building and Environment* *(Minor Revisions)*



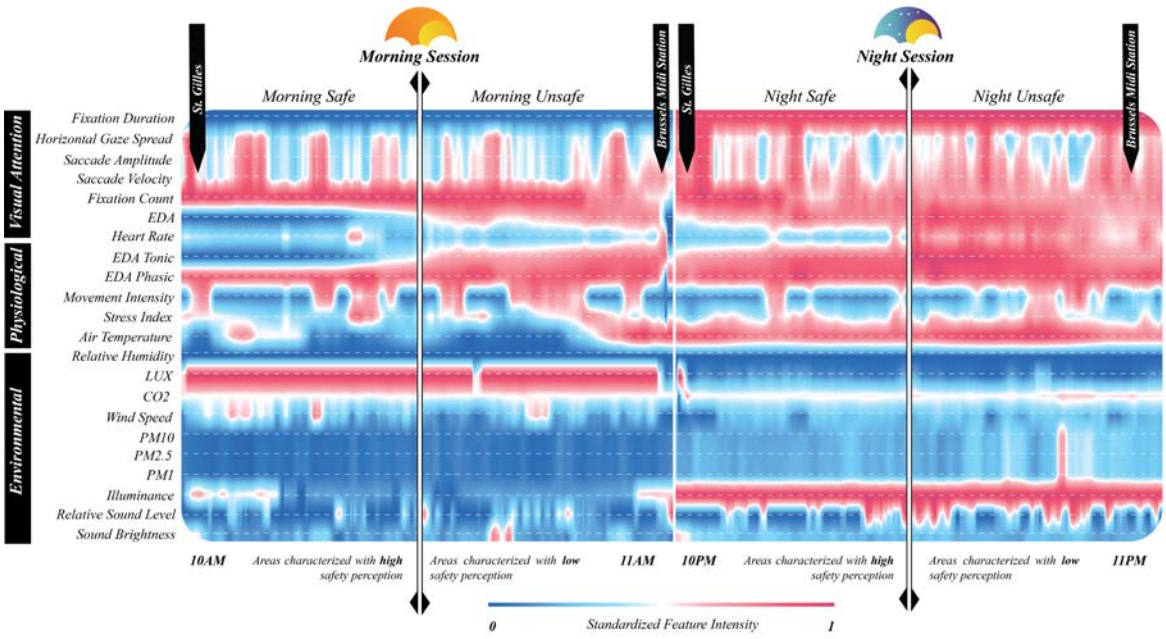
Highlights

We tend to assume that if two people are the same age and in the same place, they experience the same environment. This study shows they do not. Using wearable sensors measuring heart rate and electrodermal activity alongside environmental monitors capturing heat, air quality, and sound, we tracked eight participants through contrasting urban spaces in Rome. When thermal, acoustic, and air quality conditions were modelled together, they explained 43% of individual physiological stress, something temperature alone could not predict. More strikingly, people with similar profiles responded to identical microclimates in markedly different ways, and heat stress was found to amplify sensitivity to pollution and noise rather than act independently. To quantify these differences, a logistic growth model was applied to each participant's physiological data, producing personalised resilience profiles, measuring not just whether someone was stressed, but how quickly they recovered.

Publication C

26'
EAPLAB

- **Urban chronotypes as climate vulnerability indicators: safety-modulated bioclimatic responses and adaptive behaviour across diurnal urban contexts.**
  Grapas, C., Llaguno-Munitxa, M., Pisello, A.L., Irajpour , A., (2026), Urban Climate (Minor Revisions)



Highlights

Are we designing cities for bodies who don't exist? This study followed 18 participants through Brussels across morning and night, in areas residents themselves identified as safe or unsafe. The findings reveal a mechanism that standard climate frameworks miss entirely: in unsafe areas, people physiologically sense thermal stress just as acutely as elsewhere, but fail to translate that awareness into protective behaviour. Safety, it turns out, is not just a social concern: it is a climate adaptation variable. Beyond this, thermal sensitivity was found to increase by 24% during safe nighttime conditions, meaning the same cooling intervention achieves dramatically different outcomes depending on when and where it is deployed. Response timing analysis identified a consistent 14 to 16 minute window required for the body to complete its physiological adaptation, a direct design parameter for transitional spaces and cooling zones. Together these patterns define four urban chronotypes: distinct modes of human bioclimatic response shaped by time of day and perceived safety, revealing when and where climate infrastructure actually works.

Conference Proceedings

- **Multisensory Urban Climate Zones (MUCZ): un nuovo framework per la mappatura del comfort umano multidominio nei tessuti urbani complessi oltre la morfologia urbana**
  Grapas, C., Pisello, A.L., Pigliautile, I., 2025. Urbanistica Informazioni 321, ISTITUTO NAZIONALE DI URBANISTICA, 106673. DOI: 10.62661/ui321-2025-039

- **Day, Night & The Body. Diurnal Shifts in Acoustic Texture Drive Physioogical Arousal Across Urban Senses**
  Grapas, C., Jacoby Cureau, R., Fabiani, C., Pisello, A.L., Llaguno-Munitxa, M., (2026)

- **Thermal image prediction in urban contexts: a data-driven model for pedestrian-level thermal assessment**
  Zarbo, J., Grapas, C., Jacoby Cureau, R., Pisello, A.L., (2026). 7th International Conference on Countermeasures to Urban Heat Islands (IC2UHI), 2026, Nanjing, China.

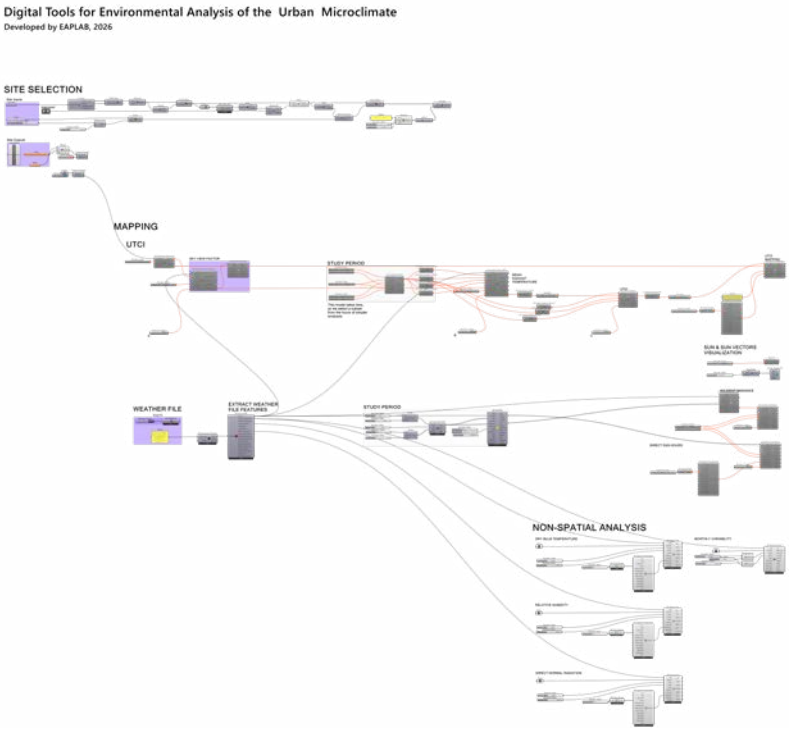
- **Environmental Perception and Urban Context: A Human-Centered Field Study in Italy**
  Jacoby Cureau, R., Grapas, C., Pisello, A.L. CATE Conference, Comfort at Extremes, 2026, Tucson, Arizona

Teaching

- Co-supervision of engineering master students on projects bridging building physics and urban studies, University of Perugia, with Prof. Anna Laura Pisello

- Contribution to teaching preparation of the Chronograms of Architecture workshop, Kanal, Brussels, with Dr. Maider Llaguno-Munitxa

- Grasshopper seminar, Microclimate Course, University of Perugia, in collaboration with Prof. Anna Laura Pisello, Dr. Claudia Fabiani, and Dr. Roberta Cureau



- Guest lecture, "The City of Marvelous Disorder", Master in City and Technology (MaCT), Institute for Advanced Architecture of Catalonia (IaaC), Barcelona, course on Data, Art & The City, led by Leyla Saadi

Acknowledgments: *None of this thinking would exist without Anna Laura Pisello, Marcel Schweiker, and Maider Llaguno-Munitxa. Any paper I have written, and any proposal I will write, carries their parts in it.*

Funded by the European Union

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