Sensory Data Dialogues: A Somaesthetic Exploration of Bordeaux through Five Senses

Fiona Bell
Department of Computer Science
University of New Mexico
Albuquerque, New Mexico, USA
fbell1@unm.edu

Karen Anne Cochrane
University of Waterloo
Waterloo, Ontario, Canada
karen.cochrane@uwaterloo.ca

Alice C Haynes
Interaction Design
KTH Royal Institute of Technology
Stockholm, Sweden
ahaynes@kth.se

Courtney N. Reed
Institute for Digital Technologies
Loughborough University London
London, United Kingdom
c.n.reed@lboro.ac.uk

Alexandra Teixeira Riggs
Digital Media
Georgia Institute of Technology
Atlanta, Georgia, USA
ariggs8@gatech.edu

Marion Koelle
OFFIS - Institute for Information Technology
Oldenburg, Germany
marionkoelle@googlemail.com

Laia Turmo Vidal
Media Technology and Interaction Design
KTH Royal Institute of Technology
Stockholm, Sweden
laiatv@kth.se

L. Vineetha Rallabandi
Sensorimotor Interaction
Max Planck Institute for Informatics,
Saarland Informatics Campus
Saarbrücken, Germany
s8larall@stud.uni-saarland.de

Abstract

The design of interactive systems and digital artefacts often makes use of digital or analog sensory data as a way to "capture" human senses and sensory experiences. Yet, designing for and with sensory data is complex because of our unique, embodied ways of making sense of our somatosensory experiences. Sensory data does not have one prescribed meaning for everyone. We propose a one-day Studio at TEI to start a dialogue about work with sensory data and its representation of human sensory experience. Specifically, we propose a guided walk and series of sensory explorations in Bordeaux to contemplate the interplay between first-person somatosensory experiences and streams of site-specific data from various sensors. By walking and noticing together, this Studio invites participants to engage in a process of creative reflection on their felt experiences, their connection to their surroundings, and their stance within or outside the design community.

CCS Concepts

• **Human-centered computing** → **Interaction design**.

Keywords

sensory data, soma design, somaesthetics, first-person perspectives

1 Introduction and Background

In the TEI and broader HCI communities, interactive systems and digital artefacts are often designed to create, collect, and interpret sensory data—data representing both human senses and the sensory experiences themselves [14]. This sensory data encompasses a variety of bodily signals and perceptions; for instance, a faster heart rate may indicate arousal or excitement [4], while other sensory references relate to our physical experiences, such as vibrations we feel [9], flavors we taste [12], and sounds we hear [6]. However, as Reed et al. observe, "sensory stimuli are not pre-labeled with objective, universally agreed meanings. Instead, we navigate and make meaning of the world through embodied lived experience, both conceptual and pre-reflective, individual and social" [13]. This subjectivity highlights how each person interprets sensory data uniquely, creating a rich, yet complex, landscape for design.

This studio explores how sensory experiences shape our perception of the world and how live data can depict or reflect these experiences. Building upon the extensive body of research around soma design [10] and somatic and sensory practices, we propose a studio focused on collecting and reflecting on diverse forms of sensory data to deepen our understanding of first-person experiences. Specifically, the studio will invite participants to playfully engage with the local environment, their bodily senses, and site-specific

sensor(y) data by taking an exploratory sensory walk through Bordeaux. Together, we will become sensitized to our surroundings by engaging with our five senses—sound, smell, taste, touch, and sight—through felt data collected by our bodies and digital and analogue sensors.

Throughout each activity, participants will document their individual experiences in any media of their choice (e.g., drawing, collage, sculpture, photos, audio recordings, written reflections) using tools including body mapping [1] to help them reflect on and remember these lived experiences. By documenting and then collectively reflecting on our experiences, we will unpack how engaging with these senses and streams of data alters, augments, and disrupts our situated experience of the city. We will critically discuss how the data collected and methods used shape our meaning-making of observed phenomena and our overall experiences. Through this process, we aim to stimulate reflection and debate on how sensory data—both lived and digital—can inform our design practices in HCI, encouraging more nuanced, human-centered approaches.

This studio is part of a broader, interdisciplinary research landscape. Philosophical theories in HCI, such as Barad's Agential Realism [2] and Latour's Actor-Network Theory [11], suggest that data exists within complex, situated configurations of actors [8]. From this perspective, data and meaning-making emerge only through relationships with agents, bodies, materials, contexts, ecosystems, and histories. This ontology realizes the world as a network of intra-acting agencies [2], where designers, design practices, and materials are embedded within a dynamic, entangled web of interactions. This view encourages us to consider ambiguity and fluidity as valuable elements of the design process, acknowledging that each sensory experience is relationally and contextually defined.

Participants will leave the studio with their 'Sensory Portfolios'—which include analog and digital components of their documented experiences—and a community with whom to explore further ideas that emerged during the session. The studio will provide HCI researchers, designers, and artists with an opportunity to engage practically with many different methods, including the use of open-source digital technology (including wireless microcontrollers connected to various sensors and actuators to explore live data on their bodies and in the environment [3, 5]) and in-situ reflections using annotated booklets [5, 7] which can include different qualitative data such as body maps [1] or journaling [5]. Additionally, by immersing themselves in Bordeaux's local environment and sensory landscape, participants are encouraged to reflect continuously throughout the conference on what it means to be a visitor or inhabitant of a unique cultural and environmental ecology. This sensory engagement aims to deepen their connection to Bordeaux and to promote active awareness of the conference's surroundings through a more present, embodied experience.

2 Studio Proposal

2.1 Learning Goals

This studio aims to provide participants with a reflective exploration of sensory data. We further ground this aim through critical discussions regarding data, somatic experiences, first-person methods, biosensors, and entangled ecologies. Accordingly, the studio will look into the following learning goals:

(1) How do our felt senses help us experience the world? How does data (both analog and digital) help us experience the world? How does all of this information compound into an understanding of sensory data?
(2) How does our sensory data shape our understanding of the world? How does sensory data enable meaning-making?
(3) How do our methods shape sensory experience and thus sensory data? How can first-person methods shape sensory data?
(4) How is sensory data site-specific? How is sensory data shaped by environments and ecologies that our bodies are situated within?

2.2 Tangible Goals

The activities of the studio will engage participants in their first-person somatic experiences of sensory data and hands-on exploration with digital and analog tools for data collection. Thus, the studio aims to provide participants with the following tangible outputs:

(1) Methods for gathering and understanding data regarding each of our senses.
(2) Rich multi-media documentation of first-person sensory data experiences.
(3) Future steps for engaging with sensory data in HCI research.

2.3 Sensory Exploration

To achieve the above goals, we will work with participants to engage with their senses in Bordeaux. Using the Supporting Materials outlined in section 3, we invite participants on a tour around the city center while engaging in the following activities:

Introduction. We will first welcome the participants and invite them to introduce themselves briefly before going through the day's agenda and available Supporting Materials (specifically the Sensory Portfolios). To set the day's tone and introduce the studio themes, we will start with a simple sensory experience to encourage participants to be fully present in the moment by slowing down and bringing focused awareness to a simple action—eating a raisin. The activity laying a foundation for sensory awareness and mindfulness in the workshop.

Sight-Focused Sensory Activity After introductions, as a group, we will engage in a slow walk toward a nearby park. Slow walking is an intentional, unhurried movement where each step is taken with mindfulness and focus. Participants are encouraged to pay close attention to the sensations of walking—how their feet connect with the ground, the subtle shifts in balance, and the natural rhythm of their breathing. This pace allows time to notice the surroundings more deeply, creating a gentle, grounded experience that invites reflection and presence in each step. This activity is designed to help participants cultivate a heightened awareness of sight and presence, bridging mindful observation with practical data collection to enrich the sensory experience. During the walk, we'll invite participants to observe their surroundings with intention and depth through the following prompts:

(1) *Environmental Awareness*: Observe how light interacts with the landscape, illuminating various textures, shapes, and colors. Notice the ways light changes with each step and shift

in perspective, whether it's casting shadows, highlighting details, or transforming surfaces around you.

(2) *Presence of People and Nature*: Reflect on the presence of others—both people and natural elements. Consider who and what occupies this space and how they contribute to the atmosphere of the environment. Observe how your perception of people, trees, or structures changes as you move slowly.

(3) *Sensory Data Collection*: To deepen the sensory experience, participants will use light and color sensors to capture data as they walk, recording fluctuations in natural light and shadows. These sensors offer a tangible way to observe and document how light interacts with our surroundings in real time.

(4) *Documenting Reflections and Data*: Each participant will receive a workbook to document their fist-person reflections on the visual experience and record data from the light sensors. This reflective writing will encourage participants to translate what they observe into personal insights, capturing thoughts on how sight and movement impact their perception of the environment.

Touch-Focused Sensory Activity We will stay in the park or walk to the nearest waterway, such as a stream or river, to engage with the environment through touch. This activity invites participants to explore their surroundings by focusing on physical sensations, enhancing their connection to the natural world.

(1) *Exploring Textures and Temperatures*: Begin by inviting participants to engage with natural elements around them—gently touching plants, soil, rocks, or water while taking care not to damage anything and avoiding anything potentially unsafe (e.g., moving water). Encourage them to notice the variety of textures, from the roughness of bark to the softness of leaves, and to observe temperature variations: the coolness of still water, the warmth of sunlit surfaces, or the cool shade beneath a tree.

(2) *Noticing Vibrations and Subtle Movements*: Ask participants to pause and feel any subtle vibrations or movements, such as the gentle breeze rustling leaves, the faint tremors of footsteps on the ground, or the flowing water nearby. This step aims to cultivate awareness of how even the smallest sensations contribute to our physical sense of place.

(3) *Body and Environment Connection*: Reflect on how our bodies physically connect to the environment. Are there grounding points—feet on the earth or hands touching the ground—anchoring us in space? How does feeling these connections change our perception of the environment?

(4) *Sensory Data Collection*: We will use vibration and temperature sensors to deepen this tactile engagement. The sensors will capture quantitative data on environmental vibrations and temperature variations, creating a tangible record of touch-based sensory experiences.

(5) *Documenting Reflections and Data*: Participants will continue to record their reflections and sensory data in their workbooks, noting their observations and data readings. This documentation will help them track how touch and the physicality of the environment shape their mindful experience.

Additionally, we will use body maps to capture and understand the felt experiences of participants more deeply.

Taste-Focused Sensory Activity We will continue the day by slow walking to lunch, where participants will eat together and focus on the taste experience through a mindful eating exercise. Participants will be asked to reflect on their sensory experiences as they eat: What flavors, textures, and even sounds are heightened as we eat mindfulness? How does sharing a meal with others impact the experience of taste?

(1) *Exploring Flavors and Textures*: Encourage participants to savor each bite, noticing subtle flavors, temperatures, and textures. Invite them to consider how each element—the crunch of vegetables or the smoothness of a sauce—contributes to the overall experience.

(2) *Physiological Reflection*: Participants can use pulse sensors to capture their heart rate, observing changes as they mindfully engage with their food. This data may reveal shifts in relaxation, excitement, or attentiveness as they eat.

(3) *Sensory Data Collection:* Participants can use pH and moisture sensors to explore tangible qualities of their food. How does engaging with this data alter their experience of tasting the food, do they perceive texture and acidity differently?

(4) *Documenting Reflections and Data*: Participants will record their reflections on taste and any physiological data in their workbooks, considering how mindful eating and social interaction impact the sensory experience of taste.

Sound-Focused Sensory Activity. After lunch, we will embark on a silent walk through a busier urban area, focusing on experiencing the environment through sound. This activity invites participants to immerse themselves in the auditory landscape and reflect on what they hear.

(1) *Exploring Layers of Sound*: Encourage participants to pay attention to the various layers and levels of sound around them. What subtle or distant sounds can they perceive beyond the obvious? Are there quieter, rhythmic, or recurring sounds beneath the louder city noises?

(2) *Human vs. Non-Human Sounds*: Invite participants to differentiate between human-made sounds, such as footsteps, conversations, or machinery, and natural sounds, like wind rustling through trees or birds chirping. Reflect on how these sounds interact and create a unique auditory environment.

(3) *Sensory Data Collection*: To support this exploration, participants will use microphones to capture quantitative data, allowing them to track the sound levels and variations around them. This data will offer a tangible record of the soundscape.

(4) *Documenting Reflection and Data*: Participants will continue to record their auditory reflections and sound data in their workbooks, noting personal observations and sensor readings. This documentation will help them explore how different sounds contribute to their sense of place and the overall sensory experience.

Smell-Focused Sensory Activity. For our final sense exploration, we will walk to a fragrance shop and/or café, focusing on the experience of smell. Participants will be encouraged to reflect on how they perceive different scents and how these scents interact with other senses.

(1) *Noticing Scents*: Invite participants to engage with the varied smells in the location. Can they identify them? Are some scents more noticeable than others? How does each scent make them feel? Do some scents evoke particular memories and associated emotions?

(2) *Impact on Other Senses*: Ask participants to reflect on how smells influence their other senses. How does a particular scent affect their perception of taste, mood, or even their sense of space and comfort?

(3) *Sensory Data Collection*: We will use odor detection gas sensors to capture and document variations in air quality, providing participants with quantitative data on the scented environment. This data will complement their reflections, adding a tangible layer to their sensory observations.

(4) *Documenting Reflections and Data*: Participants will continue to record their reflections on smell and sensor data in their workbooks, noting how scents shape their sensory experience and how they impact their awareness of the environment.

Closing. After a day of exploring Bordeaux through sensory-focused activities, we will conclude back at the studio. With participants' permission, we'll photograph their Sensory Portfolios, which they can then take home as a personal record of the day's activities. Because we will be discussing throughout the entire day, we will close with a short reflection on the following two themes: comparing felt experiences to digital data and examining the impact of being immersed in environmentally situated, embodied experiences. Lastly, we will briefly explore potential future directions for this work and consider how these insights might inform further research and practices. All participants will be invited to continue these discussions at an optional dinner after the studio ends, as well as throughout the rest of the conference.

2.4 Schedule

Our proposed studio is a one-day event planned to span 8 hours. We plan to use 15-minute breaks throughout the day to decompress from each activity and walk to the next location. We plan to spend a little over 1-hour at lunch, which we will combine with our "Taste" activity. An approximate schedule is summarized in in Table 1.

3 Supporting Materials

For this studio, we will create a custom Sensory Portfolio template that will help guide and document each activity throughout the day. The portfolios will contain question prompts, blank body maps, blank spaces, and other spaces to encourage creative reflection and collection of sensory data. We plan to print physical copies of the portfolios to give to each participant in the studio; participants will be encouraged to document their experiences in ways that are most meaningful to them. We will also provide a a digital version of the Sensory Portfolio, available to download on our studio website, to be created before the conference. Here, we will also post the studio information, call for participation, schedule, and organizer info. We will recruit participants via our studio website, as well as email lists and social media channels to promote the studio. We then plan to communicate directly with participants via a transparent email chain so that participants can connect and ask questions before and

Time	Activity
09:00 - 10:00	**Introduction**
10:00 - 10:15	Walk to location for "Sight"
10:15 - 11:15	**Sight**
11:15 - 11:30	Walk to location for "Touch"
11:30 - 12:30	**Touch**
12:30 - 12:45	Walk to to location for "Taste"
12:45 - 14:00	**Taste** with Lunch
14:00 - 14:15	Walk to location for "Sound"
14:15 - 15:15	**Sound**
15:15 - 15:30	Walk to location for "Smell"
15:30 - 16:30	**Smell**
16:30 - 17:00	**Closing**
17:00 -	Optional Dinner

Table 1: Proposed studio schedule, including transitions between activities. Main activities are bold.

after the studio. Upon the completion of the studio, we envision sharing photos of the studio on social media and our studio website. We will also document the experiences and data collection, for instance through photos of each participant's Sensory Portfolio before they take the portfolios home. We finally plan to disseminate and reflect on these portfolios, with the continued involvement of the participants, through future publications.

4 Format, Accessibility, and Asynchronous Engagement

We propose that this studio be held fully in person as it relies on sensory experiences that are situated in the local context of Bordeaux. We note that this workshop will involve a decent amount of walking around the city. To ensure accessibility, we will organize alternative transportation options for moving to each activity location where needed. We intend to openly communicate with each of the participants to make sure they feel comfortable and confident participating. To enable asynchronous engagement, we will make the digital version of our Sensory Portfolios available on our studio web page: https://uwaterloo.ca/stratford/sensory-workshop.

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