

Sensing Our Environment - the 'Sounds and Sweet Airs' Project

Sensory Experience Design Studio: Nong Hua Lim, Kornbongkoch Harnpinijesak, Weichen Tang

Abstract

This is a sensory project that aims to evoke conversations about human-environment relationships through an immersive synthetic sound ecology featuring several mechanical “species” of creatures that generate sounds from everyday recycled materials. These critters, each having its own personality, are sensitive to different elements of the physical environment. When distributed in a built environment, they create an evolving soundscape that reflects the state of the space they occupy and collectively produce a nature-like sound atmosphere the kind of which is gradually disappearing in our ever-urbanised environments. Through a series of iterations and evolutions, the work rethinks humans’ sonic relationship to the built environment in relation to memories of natural habitats. By immersing the audience in a sound field of subtle auditory cues, the project stimulates more intimate sensory connections to the spaces around us.

Keywords: built environment; human-nature relationship; Sensory experience; soundscape; synthetic ecology

Sensing Our Environment - the 'Sounds and Sweet Airs' Project

Sensory Experience Design Studio: Nong Hua Lim, Kornbongkoch Harnpinijesak, Weichen Tang



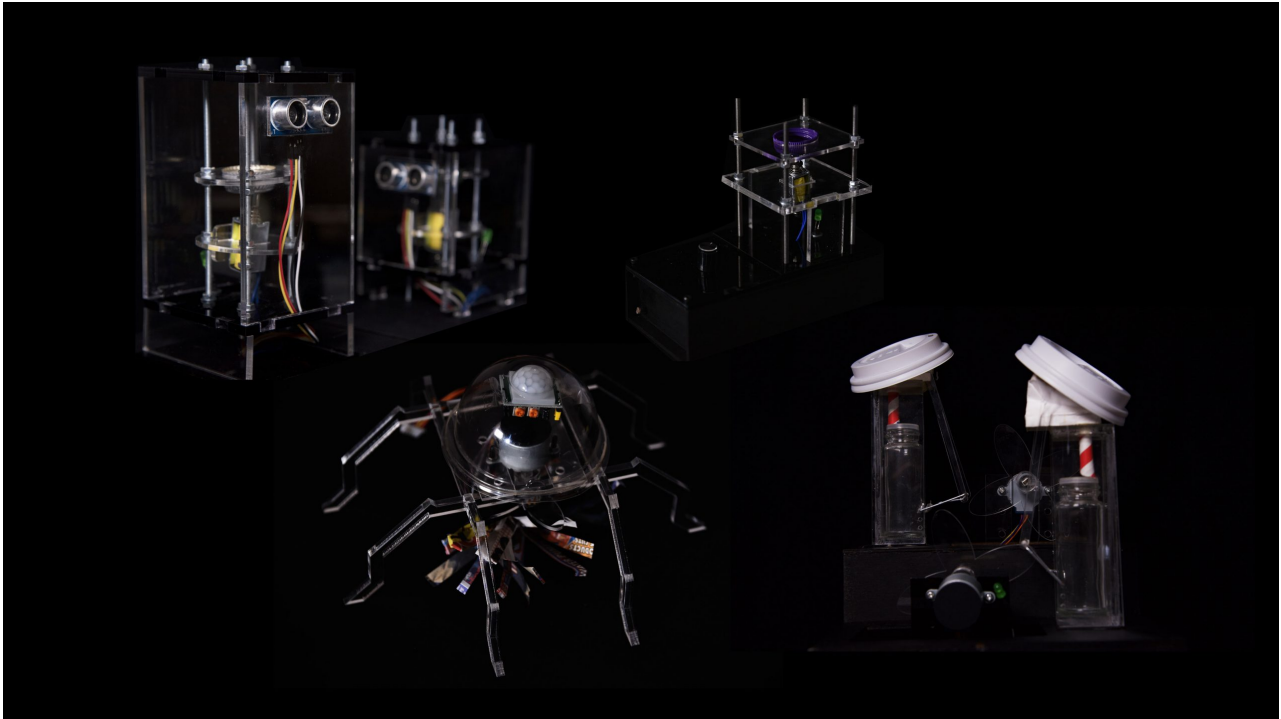
Be not afeard, the isle is full of noises,
Sounds, and sweet airs, that give delight and hurt not.

— Shakespeare, *The Tempest*

Posing questions about the human-environment relationship, a design team from the Interactive Architecture Lab at UCL has developed a sensory project titled *Sounds and Sweet Airs (S&SA)* in the form of an immersive synthetic ecology, featuring several robotic critters built from waste materials and inspired by aural memories of mother nature.

The synthetic ecology currently consists of four mechanical 'species' of creatures: Chirpie, Little Chirpie, Rustlie and Hootie, with their names derived from the sounds they generate from everyday recycled materials such as bottles, caps and papers. These creatures are sensitive to different elements of the physical environment including temperature, humidity, light, sound and human movement; and they have

their own personalities – some are friendly, some are aggressive, some are shy, etc. When distributed in a built environment, these mini-robots create an evolving soundscape that reflects the state of the space they occupy, forming a nature-like sound atmosphere – the kind of which is increasingly disappearing in urbanised environments.



Four species of the S&SA synthetic ecology, clockwise from top left: Chirpie, Little Chirpie, Hootie, Rustlie.

There are a lot of cues in the natural soundscape, the crickets' chirps indicate the temperature, some birds sing extensively within specific timeframes, animals vocalise differently when they sense danger... And we are trying to address our sonic relationship to the built environment by tapping into our memories of natural habitats.

— Sensory Experience Design Studio

This exploration began with personal sound memories, then gradually developed into a shared recollection. One team member recounted a memory through a sound – describing a typical rainy day in a Southeast Asian forest. She was inspired by the natural soundscapes of the forest after the rain, feeling as if she stood in the middle of nowhere, hearing sounds from different directions. This inspiration led the team to explore sonic approaches and the behavioural characteristics of creatures they named Chirpie, Little Chirpie, Rustlie, and Hootie.

The team then experimented with various materials, such as plastic bags, caps, paper, and straws, to mimic sounds from our memories. We explored producing sound using vibration, wind and movement. Objects were designed to produce sounds reminiscent of natural environments while intentionally evoking a machine-made quality. This design choice aimed to raise awareness about the impact of human activity on the environment by questioning the nature of machine-produced sounds in contrast to natural ones. These

instinctively recognisable sonic patterns bring audience members back to moments where they encountered similar sounds, evoking sensory memories of sound environments experienced in the past. In fact, the synthetic ecology of S&SA adopts sensory methods, and the sound patterns, habitats of preference and behavioural characteristics of the creatures are designed in a way that matches with perceptual experience – aiming to stimulate a more intimate sensory connection to everyday sonic environments.

The first iteration of S&SA – an interactive sensory experience in a dark space – was exhibited at Here East, at University College London. Constrained by the size of the space, sounds generated by the creatures were captured live and then amplified through a sound system installed in the space. Audience members were invited to explore the space freely and interact with the critters. Since it was an almost pitch-dark space, audience members' vision was half-deprived, leading to heightened sensory awareness and a greater focus on auditory and tactile stimuli.

This heightened sensitivity resulted in the audience being more attuned to the sounds and textures of the environment, as well as more engaged in the exploration process. In particular, participants were observed moving more cautiously, using their hands to feel their surroundings and listening intently to the sounds of the critters. As a result, this increase in attentiveness suggests that sensory deprivation can enhance the immersive nature of the experience and encourage deeper engagement with the environment. From this, it can be inferred that altering sensory conditions in immersive experiences can influence audience behaviour and contribute to a more profound and memorable interaction with the artwork.

By experimenting with the possibilities of modern technology, the second iteration of S&SA was developed for a single-audience mixed reality (MR) experience, facilitated by a headphone tracking system. Physical sound creatures were carefully placed in the exhibition space to encourage exploratory behaviour; combined with a virtual soundscape, the team recorded the sound from physical creatures and amplified these through the headphones, with the virtual soundscape evolving according to the movements of the audience members. Individual critters behave differently within the MR experience. For example, Chirpie produces louder sounds as an audience member approaches, but the sound stops if they get too close, mimicking the behaviour of a natural creature, an insect. In other words, through exploring the physical space differently, audience members experienced complex sound narratives that were unique to everyone. In contrast to the first iteration, this version included spatial lighting design to reduce the anxiety caused by visual deprivation and to motivate audience members to move around, not to mention imbuing the space with an imaginative atmosphere. The approach developed for this iteration is well suited to an exhibition context, and has been presented at the Ars Electronica Festival 2019 (Austria) and at FOLD Club (London) in 2019.



At the S&SA exhibition at FOLD Club, London, one audience member immersed themselves in a mixed reality experience, while others delved into the locker space, which is also a part of the main exhibition where the mixed reality experience took place.



S&SA exhibition at the Ars Electronica Festival 2019, Austria. The audience came mainly from mainland Europe, the UK and Asia. They were instructed to move in a more attentive way, leading them to 'discover' some hidden creatures. Audience feedback demonstrates that individuals have a tendency to relate these sounds to their past experiences in nature; comments include: 'When I was in South Africa, it sounds like rainforest, a lot of insects', 'national park, alone at night', 'An evening in bamboo house', and 'feel like under the sea'. While in terms of the visual engagement, audience members described this experience as like 'half machine, half nature', 'digital robot forest', and 'all the artificial objects are super robot but sound like nature, so it feels like nature but not really'.

The third iteration of S&SA – specially created for a Tate Late event in London under the theme 'Bauhaus Recoded' (2019) – was a comprehensive workshop experience. In order to engage people more intimately with sound materials, the creature design was optimised for a simpler and more intuitive structure that allows anyone to build and modify one of the critters. At the event night, the public were invited to explore the sonic potential of discarded materials, as well as taking part in the evolution of the synthetic ecology by customising their own sound creatures – choosing the materials, tuning their frequencies, defining their sensibilities etc. After this, they could suggest the creatures' habitats by placing them at desired positions in the exhibition area; and by doing that, they were at the same time collectively shaping the spatial experience for their fellow audience members to explore with a torch.

In this case, the materials that generate the sounds are hugely important. For example, plastic caps sound different to metal caps: with the right cap size and striking frequency, the former produces a froggy croak while the latter emits a crickets chirp. By exploring sounds through making, people are encouraged to actively sense the surrounding environment as well as embracing their own sound memories.





S&SA workshop experience at Tate Britain, London. Despite the sometimes crowded atmosphere, visitors had intimate experiences listening to different materials, as well as embodying subtle sound memories through creature-making.

Having been through several iterations, we felt the urge to present S&SA in an everyday context with the intention of raising sensory awareness of the environments that we are living in. Thus, in December 2019, the final iteration of S&SA was presented at Second Home Spitalfields, London (a unique coworking space in the heart of East London). For this version, the sound materials were mostly gathered on-site to let people relate to the installation more directly, and the critters were carefully positioned to blend into the space, including locations such as a working seating area, a pantry, and spaces behind columns. As night fell, these nocturnal robotic creatures came to life, transforming the whole area into a space for sensory experience – challenging expectations of a working space and suggesting a new co-living experience that adopts tech-infused biophilic design.



S&SA presented at Second Home Spitalfields, London. In the context of a co-working space, this project is brought closer to everyday life to provoke thoughts about human nature and the built environment.

As a research project focusing on extended auditory systems, sensory interaction and behavioural priming, S&SA is intended to evoke reflections about the human-environment relationship through diverse experiences and interpretations. Throughout this research development process, perspectives from acoustic ecology and perceptual science have been absorbed to construct a sound ecology. Using priming techniques, the research focuses on audience needs and factors that influence how individuals perceive their environments and how this influences their behaviours. Sensory design, which centres around activating touch, sound, smell, taste and body wisdom, enhances the experience of environments (Lupton and Lipps, 2018). The notion of the extended auditory system, which emphasises the contextual and immersive nature of auditory perception, underpins this comprehensive approach (Lim, 2019). Further influences include Bättig-Frey et al. (2018) on combining art with science and Hollingworth and Barker (2016) on behavioural priming. These explorations have significantly impacted the design process.

Our senses evolve through the interactions with the surrounding environment, that is to say, what we perceive is the result of how we exist and live in our environment; no one shares the same perceptual experience, and nothing should be taken for granted.

— *Sensory Experience Design Studio*

It is hoped that, through aesthetic or intellectual appreciations, the *Sounds and Sweet Airs* project could encourage a more sensitive perceptual culture in this ever-more digital era, as well as inspiring and inviting the public to collectively imagine and play a part in shaping better future environments.

Credit:

Interactive Architecture Lab, the Bartlett School of Architecture, UCL

<http://www.interactivearchitecture.org>

References

Bättig-Frey, P., Jäger, M., & Treichler Bratschi, R. (2018), 'Combining Art with Science to Go Beyond Scientific Facts in a Narrative Environment', *Journal of Museum Education*, 43:4, pp. 316–324.

Hollingworth, Crawford and Barker, Liz (2016), *The power of priming, exploring the latest thinking*, London: The Behavioural Architects.

Lim, N. H. (2019). *Extended Auditory System in Designing Auditory Experience*. MArch thesis, London: University College London.

Lupton, E. and Lipps, A. (2018), *The senses*, New York: Cooper Hewitt, Smithsonian Design Museum.

Harnpinijesak, K. (2019), *An exploration of sensory design: How sensory interaction affects perceptual experience in an immersive artwork*, MArch thesis, London: University College London.

Weichen Tang (2019), *An exploration of priming effect to improve audience/user experience in narrative environment*, MArch thesis, London: University College London.

About the author

Sensory Experience Design Studio are a London-based multidisciplinary design studio with three members from different countries: Nong Hua Lim (MY), Kornbongkoch Harnpinijesak (TH) and Weichen Tang (CN). They met at the UCL Interactive Architecture Lab in 2018, then formed a design team in 2019 and started working on experiential projects that tackle the human-environment relationship with new media methods. Aiming to promote a more sensitive perceptual culture, the studio produces works from both research and design perspectives, and some main areas of exploration include sonic effect, cross-modal interaction, experiential narrative, behavioural impact and mental wellbeing.