TU Delft Interactive Environments Minor Workshop 2022

Living Architecture Systems Group

TU Delft Interactive Environments Minor & TU Delft Science Centre

This folio documents student outcomes from the Living Architecture Systems Workshop held at Science Centre Delft and the Interactive Environments Minor of TU Delft, November 7–12, 2022. The workshop focused on introducing students to methods used by the Living Architecture Systems Group (LASG) in creating responsive environments by exploring fabrication, digital twin approaches, and behaviour programming.[1] The workshop was preceded by preparatory talks and instructional folios as well as an introductory lecture by Philip Beesley. Students were given access to the LASG's library of geometric scaffolding, actuation hardware, and behaviour programming in order to explore and apply to their own projects.

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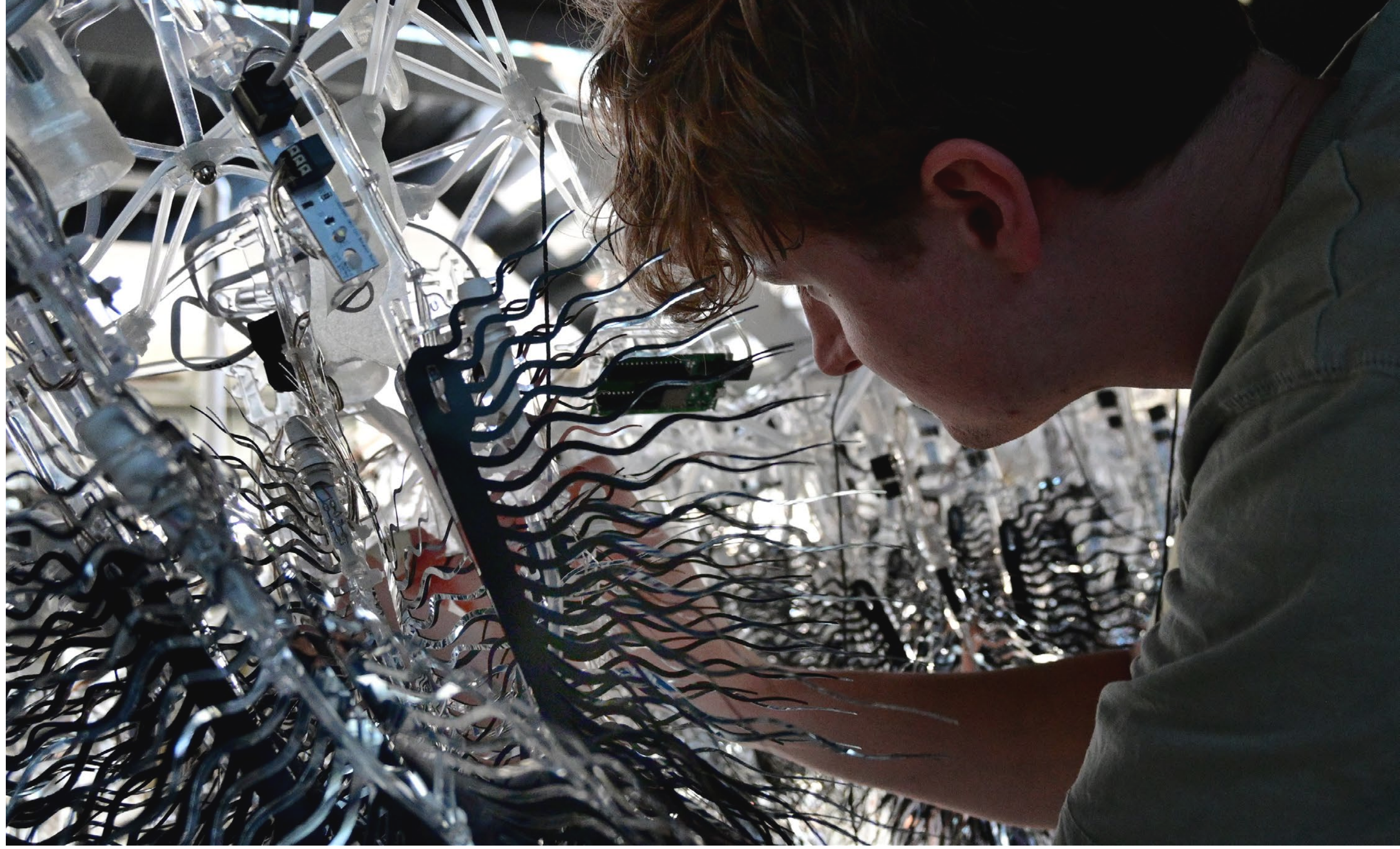

TU Delft Interactive Environments Minor Workshop 2022

LIVING ARCHITECTURE SYSTEMS GROUP

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TU Delft Interactive Environments Minor Workshop 2022

Living Architecture Systems Group

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About the Living Architecture Systems Group

The publication forms part of a series of work-in-progress reports and publications by Living Architecture researchers and contributors. The Living Architecture Systems Group is an international partnership of researchers, artists, and industrial collaborators studying how we can build living architectural systems— sustainable, adaptive environments that can move, respond, and learn, and that are inclusive and empathic toward their inhabitants. "Smart" responsive architecture is rapidly transforming our built environments, but it is fraught with problems including sustainability, data privacy, and privatized infrastructure. These concerns need conceptual and technical analysis so that designers, urban developers and architects can work positively within this deeply influential new field.[1] The Living Architecture Systems Group is developing tools and conceptual frameworks for examining materials, forms, and topologies, seeking sustainable, flexible, and durable working models of living architecture.

A series of far-reaching critical questions can be explored by using the tools and frameworks that are described within this specialized publication series: can the buildings that we live in come alive? Could living buildings create a sustainable future with adaptive structures while empathizing and inspiring us? These questions can help redefine architecture with new, lightweight physical structures, embedded sentient and responsive systems, and mutual relationships for occupant that provide tools and frameworks to support the emerging field of living architecture. The objective of this integrated work envisions embodied environments that can provide tangible examples in order to shift architecture away from static and inflexible forms towards spaces that can move, respond, learn, and exchange,[2] becoming adaptive and empathic toward their inhabitants.[3]

1 Kas Oosterhuis and Xin Xia, *iA #1, Interactive Architecture* (Rotterdam: Episode Publishers, 2007); Nicholas Negroponte, *Being Digital* (New York: Vintage Books, 1995); Lucy Bullivant, *4dsocial: Interactive Design Environments* (London: AD/John Wiley & Sons, 2007); Neil Spiller, *Digital Architecture Now: A Global Survey of Emerging Talent* (London: Thames & Hudson, 2009). Michael Fox and Miles Kemp, *Interactive Architecture* (Princeton: Princeton Architectural Press, 2009).

2 For example the Living Architecture (LIAR) next-generation, selectively programmable bioreactor developed by LASG Metabolism Stream Lead Rachel Armstrong, Newcastle, uses microbial processes to generate electricity, oxygen, fertiliser, and other life-sustaining outputs from waste (carbon dioxide, grey water) that would otherwise be ejected from a building: "Living Architecture LIAR," accessed February 2, 2022, https://livingarchitecture-h2020.eu/.

3 Bullivant, *4dsocial.*

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Introduction

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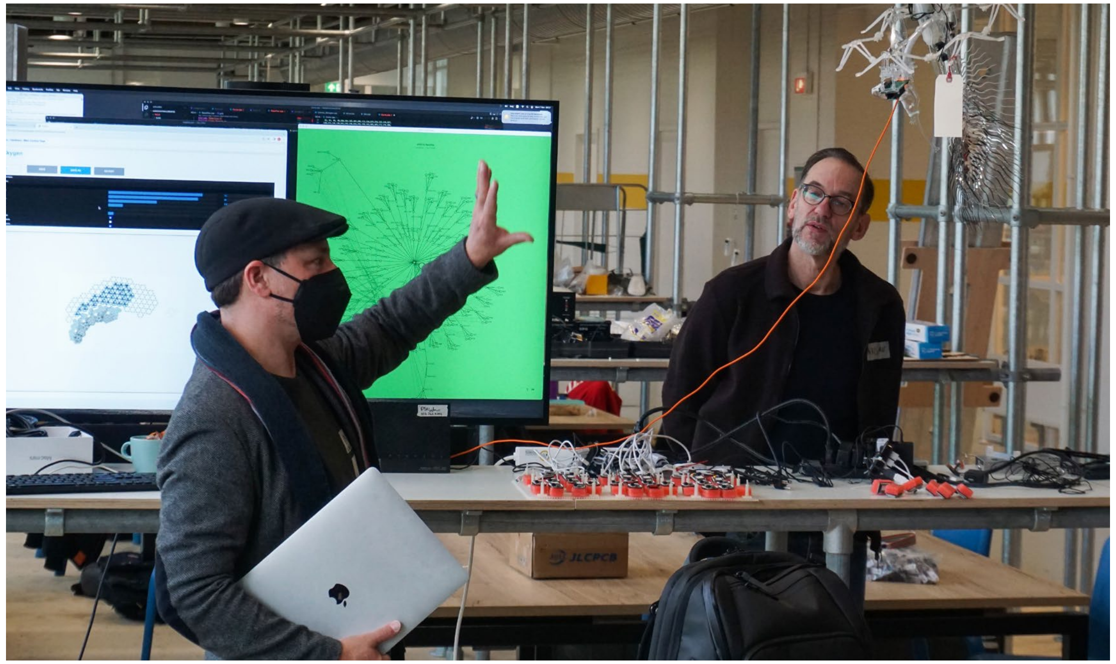
4 Philip Beesley, Sachiko Hirosue, Jim Ruxton, Marion Trankle, and Camille Turner, *Responsive Architectures: Subtle Technologies* (Waterloo: Riverside Architectural Press, 2006).

The Interactive Environments minor is one of multiple minor courses offered by the TUDelft as part of the third year of the bachelor program. A minor is a full semester of education offering bachelor students the opportunity to explore topics or modes of working beyond the scope of their own bachelor program. The Interactive Environments minor course program bridges the disciplinary fields of design, architecture, and engineering and introduces a making-first strategy to conceptualise for real-world design assignments.

The LASG folio consists of work-in-progress reports and publications by LASG researchers and contributors.

Facing Page

Philip Beesley gives a prepatory talk about the LASG's methods



Facing Top Matt Gorbet introduces the concept of influence engines to the workshop

Facing Bottom Students working on metal crenellations for testbed installation

Top Right Assembling Nest Sphere component

Top Left Dressing explorations by students

Middle Students test hanging a portion of the testbed installation

Bottom Student finishes installing an actuator for the testbed installation

References

"Living Architecture LIAR," accessed February 2, 2022, https://livingarchitecture-h2020.eu/.

Lucy Bullivant, *4dsocial: Interactive Design Environments* (London: AD/John Wiley & Sons, 2007)

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