

HORTUS BIONICA – Robotic Garden for Sustainable Habitat Design

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Introduction

Origami is usually associated with the traditional paper-folding arts from Japan. However, in recent years, this fascinating technique has been rediscovered and applied in unexpected ways. Research institutes, including NASA, are currently working on groundbreaking innovations using origami to create deployable structures for space travel. By folding and unfolding, the origami structures are extremely efficient in altering their form and dimensions.

Sprout – precursor

Sprout is a precursor to our [1] new project HORTUS BIONICA in collaboration with Sensor Lab. She is our vision of adaptive future architecture that interacts with users and environmental factors. The resulting species, inhabitants of HORTUS BIONICA, are able to react to stimuli and change shape in an automated way in response to changing needs and circumstances. A garden of robotic textile creatures resemble nature in architectural setting and carry out a number of smart functions including climate and UV control. Sprout is a germinating seed of future architecture that we want to send to the Moon as a part of Moon Gallery [2] as we believe that textile origami structures can provide unique advantages for human habitats on and off Earth.

HORTUS BIONICA

Imagine buildings that act like living organisms: a sensory architecture that reacts to the user and to the environment (light, heat, sound, movement). We envision architecture to play upon the synergy between user and space to improve the indoor climate. This becomes a sustainable architecture that directly responds to our experience of space. This vision for the future of architecture sets the basis of our ongoing research on 3D textile applications in collaboration with Sensor Lab [3] and the TextileLab

[4], resulting into HORTUS BIONICA: flexible 3D textile installations that combine origami structures and sensors to optimize the indoor climate.



Fig.1 HORTUS BIONICA Interactive installation



Fig.2 Sensor Lab integrating sensors



Fig.3 HORTUS BIONICA main image

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References

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- [2] <http://www.moongallery.eu>
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- [4] <https://www.textiellab.nl/nl/>