SHErobots: Tool, Toy, Companion

Bier, H.H.

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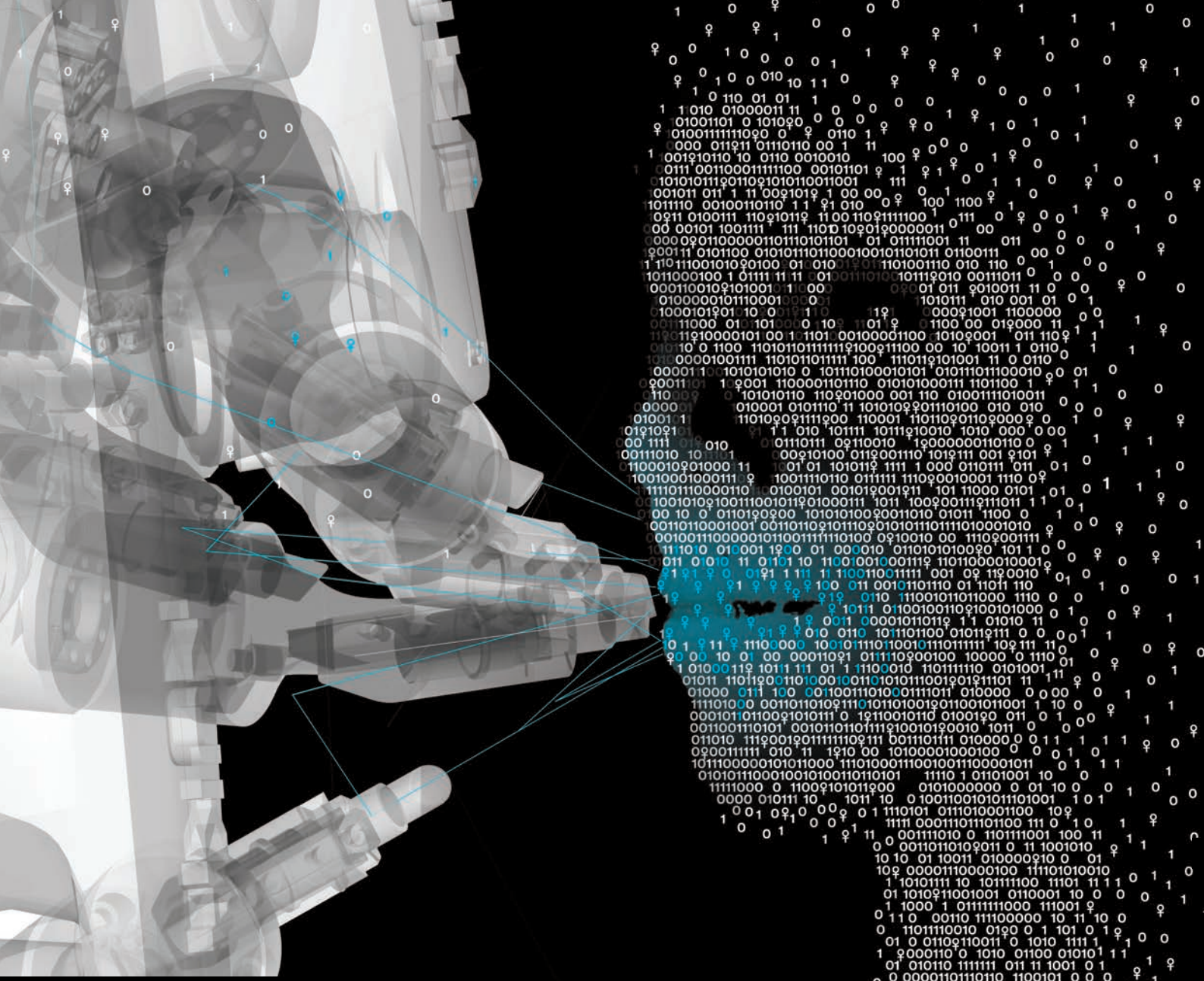

SHErobots

tool:toy:companion

AN EXHIBITION HELD AT TIN SHEDS GALLERY
148 CITY ROAD, DARLINGTON NSW 2008
THE UNIVERSITY OF SYDNEY
20 OCTOBER – 10 DECEMBER 2022

SHErobots: Tool, Toy, Companion

Dagmar Reinhardt, Lian Loke, Deborah Turnbull Tillman

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Tin Sheds Gallery is a cross-disciplinary exhibition space at the University of Sydney to advance public debate on architecture, art, design and urbanism in contemporary society through innovative exhibitions, publications and related activities.

Front and back cover page image credit: Iris Shen, Dagmar Reinhardt and Lian Loke.

THE UNIVERSITY OF SYDNEY

UNSW SYDNEY

Bio-cyber-Physical Planetoid
Henriette Bier
2020-21
Biopolymer
700 mm diameter
Image credit: Robotic Building Lab, TU Delft

Bio-cyber-Physical Planetoid

Henriette Bier

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\robotic 3D printing
\biomaterials
\material practices

\circular economy
\microclimates
\human and
more-than-human

The *Bio-cyber-Physical (BcP) Planetoid* is a project resulting from multi-disciplinary collaboration between Landscape Architecture (LA) and Robotic Building (RB) at TU Delft and various academic and industrial partners. It presents minimal urban interventions that stimulate both biodiversity and social accessibility of residual places. These interventions aim to help existing life in the specific location by encouraging development of biodiversity, water management and social interaction. The *BcP Planetoid* is robotically 3D printed using wood-based biopolymer and is 0.7m in diameter. Hence, it can be easily placed in various locations, where all human and non-human agents are invited to engage in socio-technical interactions.

Credits
Team RB:
Henriette Bier
Arwin Hidding
Max Latour
Vera Laszlo

Team LA:
Pierre Oskam

Collaborators:
Hamed Alavi and Denis Lalanne (UniFri)
Klaus Starnberger (Tokencube)
Arwin Hidding, Jasper Menger, and Rene Ritmeijer (3D Robot Printing and Dutch Growth Factory)

With its cavernous design, the *BcP Planetoid* offers a protected environment for hosting earth balls with seeds that develop into plants, as well as animals and sensor-actuators. If the natural systems consist of (i) plants such as dandelions, chamomile, and poppies, (ii) insects such as butterflies, dragonflies, bees, and (iii) small animals such as snails, hedgehogs, and rodents, the sensor-actuators focus on monitoring and communicating with the environment and its users.

The process involved Design-to-Robotic-Production and -Operation (D2RP&O) methods developed in the RB lab, since 2014. It links computational design with robotic production and operation and advances robotic and user-driven building operation in both physically built environments and building processes.

In the presented project, D2RP focused on 3D printing, while D2RO techniques were implemented for the sensor-actuator systems integrated in order to track microclimates within and around the planetoids, and to encourage human and non-human agents to interact. The interaction includes activities such as (a) monitoring plants, insects and animals, and (b) involving users with the goal to engage neighbours and passers-by with the planetoids and their environments, which go through several stages of development and transformation from bare planetoids to overgrown with plants. The main actuation is in the form of mobile application notifications informing the users about the emerging activities around the planetoids or the need for their action (e.g., watering the plants).

Variable Stiffness
Henriette Bier, Arwin Hidding (TU Delft)
in collaboration with 3D Robot Printing
2017-18
Robotic 3D printed thermoplastic elastomer
Still from Video documentation (2min)
Image credit: Robotic Building Lab, TU Delft

Bio-cyber-physical Planetoid
Henriette Bier, Arwin Hidding, Max Latour,
and Vera Laszlo in collaboration with Pierre
Oskam (TU Delft) and UniFri, Tokencube,
Dutch Growth Factory, 3D Robot Printing
2017-18
Robotic 3D printed biopolymer, climate and
movement sensors
Still from Video documentation (2min)
Image credit: Robotic Building Lab, TU Delft

Rhizome
Henriette Bier, Arwin Hidding, Max Latour,
Fred Veer and Vera Laszlo (TU Delft) in
collaboration with ESA and Vertico
2017-18
Robotic 3D printed concrete
Still from Video documentation (2min)
Image credit: Robotic Building Lab, TU Delft