Iaac

LIVING DESIGN

Iaac

Can we build the future of cities

through a nature-based approach?

RECOMMENDED READINGS

The Self Sufficient City, Vicente Guallart

Ecological Urbanism, Mohsen Mostafavi, ed., Baden: Harvard University GSD, Lars Müller Publishers, 2010

Creative Food Cycles Catalogue (first section - production to distribution)

DESIGN ONLINE NEWSPAPERS (we suggest to look for keywords as ecological design - bio-design)

Dezeen Magazine

ArchDaily

urbanNext

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CASE STUDIES

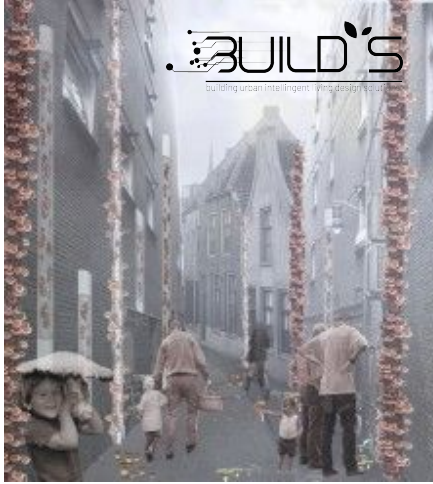
Vertical Mushroom Garden

Author(s): Jacques Abelman

Year: 2017

Location: Amsterdam, The Netherlands

Web:
http://www.groundcondition.com/portfolio/vertical-mushroom-garden/



The Mushroom Garden aims to capture a part of the urban waste stream in the form of used coffee grounds and transform it into food.

The vertical growing system uses recycled plastic cylinders placed on the walls of narrow alleys – or stegen– in inner city Amsterdam. The cool, protected alleys are very suitable for mushroom cultivation. Constant conditions are maintained inside the transparent growing cases, and rainwater is used to provide humidity.

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Pyramid Garden

Author(s): Allan Murr and Cem Guvendiren

Year: 2014

Location: Adaptable

Web: http://www.pyramidgarden.com/about

Contact: http://www.pyramidgarden.com/contact

Pyramid Garden is an aeroponic vertical way to organically grow vegetables, herbs and flowers up to 30% faster with 80% less water, without any soil needed. The roots, which are hanging inside the pyramid, are sprayed with nutrient rich water. Excess water drips back into the tray, is filtered and recycled. Leafy vegetables grow on the outside, while root vegetables grow on the inside. Planting can be done in stages and because of its shape, Pyramid Garden allows for more sunlight compared to other systems with flat surfaces.

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Greenhouse

Author(s): Jenny Sabin

Year:

Location: Philadelphia, USA

Web: http://www.jennysabin.com/greenhouse

Contact: js@jennysabin.com / +1 607 339 0850

Made of recycled and recyclable materials, the 52'-long structure has no glass and requires no heat. It is supported by curving, structural ribs that hold 110 translucent, jewel-toned cold frames (mini-greenhouses) filled with edible and ornamental plants. The 2' x 1' x 1' cold frames are removable and portable, intended for winter gardening in small urban spaces. Her ecologically savvy structure re-envisions greenhouse architecture using digital design tools.

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USA Pavilion - Milan Expo 2015

Author(s): Biber Architects

Year: 2015

Location: Milano, Italy

Web: https://www.biber.co/architecture/expo-milano-2015-usa-pavilion-1/

Contact: hello@biber.co / + 1 212-683-7071

The USA Pavilion for Expo Milano showcases America's role in the future of food and hosts a global conversation about the challenge of feeding more than 9 billion people by 2050. The main architectural feature was a football-field-length "Vertical Farm" featuring a variety of harvestable crops in a vertical array. It was as though a typical horizontal agricultural field was rotated 90° to clad the side of a building. It's not a proposal for serious urban or vertical farming, (usually indoors) but a didactic display talking about the past, present and future of the American farm, and the American diet.

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Hy-Fi

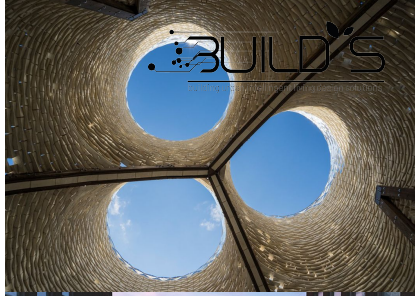
Author(s): The Living

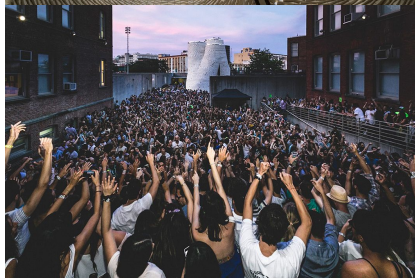
Year: 2014

Location: New York

Web: http://www.thelivingnewyork.com/

Contact: life@thelivingnewyork.com





The Living's Hy-Fi offers a captivating physical environment and a new paradigm for sustainable architecture. In 2014, they tested and refined a new low-energy biological building material, manufactured 10,000 compostable bricks made with mushrooms, constructed a 13-meter-tall tower, hosted public cultural events for three months, disassembled the structure, composted the bricks, and returned the resulting soil to local community gardens. This successful experiment offers many possibilities for future construction.

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Cyber Algae Farming

Author(s): ecoLogicStudio

Year: 2013

Location: Paris, France

Web: https://www.designboom.com/technology/ecologicstudio-explores-cyber-algae-farming-with-hortus/

Contact: projects@ecologicstudio.com / +44 (0)77 4601 2757

'HORTUS.PARIS' harnesses algae farming to host a number of micro and macro-algal organisms. The experimental prototype encourages the engagement of visitors to the exhibition through 'cyber gardening'. Visitors can contribute to the living installation and QR Codes adorn each of the 'plots' in which visitors can access information about the garden's progress.

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Algae Cellunoi

Author(s): MarcosAndMarjan with Richard Beckett & Guan Lee

Year: 2013

Location: Orleans, France

Web: http://syndebio.com/algae-cellunoi/

Contact: m.cruz@ucl.ac.uk, richardbeckett@syndebio.com

The installation is an ornamental wall structure for external use made up of numerous cellular components that work as a scaffold for algae to grow. The overall organisation of the cellular components is the result of a computational voronoi pattern which allows for a gradual involvement of nature in its 3D surface. Each cellular component is seeded with terrestrial algae that grows in the ridges of the variable patterns. This fast growing algae lives symbiotically in lichens which grow much slower but ultimately create an enduring natural outer protection for the insulation wall. Each cellular component is also designed to host a variety of flasks in which liquid algae can grow for ground fertilization.

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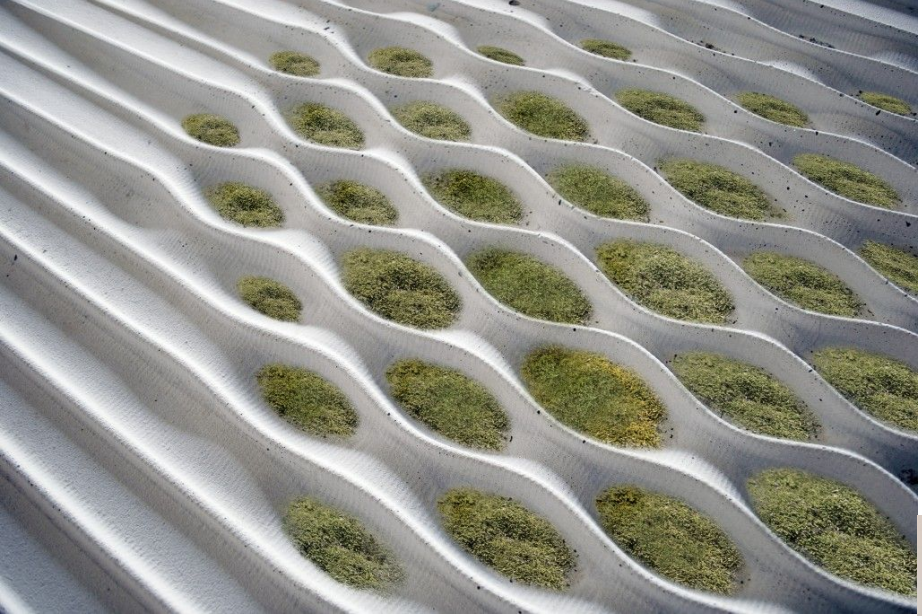

Bioreceptive Concrete Facade Panels

Author(s): Richard Beckett and Marcos Cruz

Year: 2015

Location: London

Web: http://syndebio.com/bioreceptive-facade/

Contact: m.cruz@syndebio.com / +44 77 1211 7201

As part of the Computational Seeding of Bio-Receptive Materials research proposal, this project aims to develop an innovative wall-panel system capable of growing microorganisms directly on its surface. By utilizing novel design engineering methods the research seeks to improve facade performance through the implementation of a new type of biologically receptive concrete. This system intends to overcome many of the limitations of existing green walls, particularly the need for mechanical irrigation systems and expensive maintenance.

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Living Seawall

Author(s): Volvo

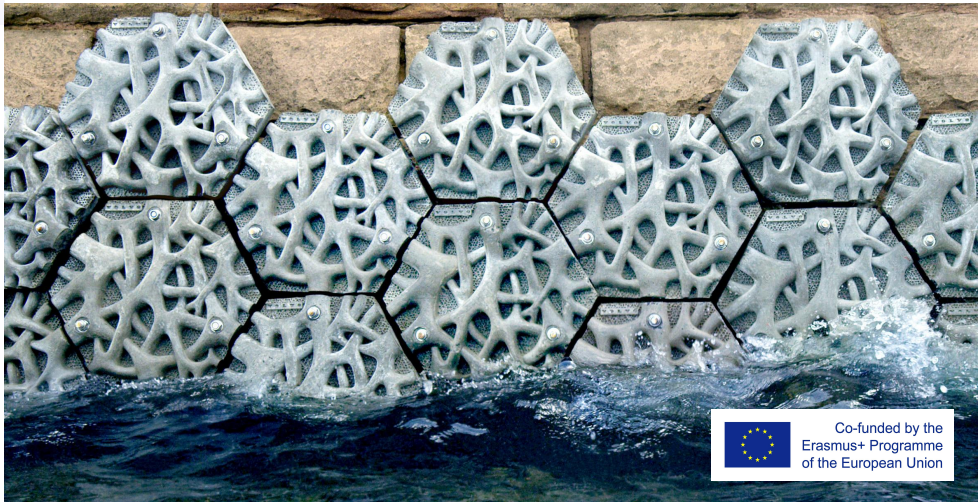
Year: 2019

Location: Sydney

Web: https://www.dezeen.com/2019/01/31/volvo-living-seawall-pollution-biodiversity-design/

Volvo has installed an environmentally friendly seawall along the coast of Sydney's harbour that aims to improve biodiversity and water quality in the area.

The Volvo Living Seawall consists of 50 hexagonal tiles with small corners and recesses that are designed to imitate the root structure of native mangrove trees – a popular habitat for marine wildlife



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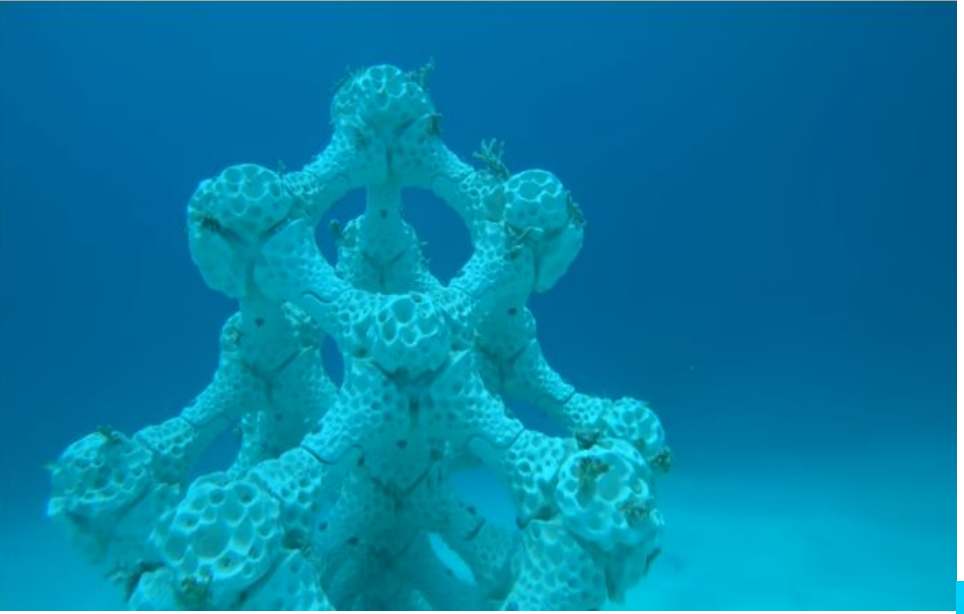

3D Printed Corals

Author(s): Reef Design Lab

Year: 2019

Location: Maldives

Web: https://www.ctvnews.ca/sci-tech/world-s-largest-3d-printed-reef-installed-in-maldives-to-help-save-corals-1.4056977?cache=%3FclipId%3D104066

In the context of global warming, bleaching and environmental pollution, the 3D printing technology can offer a new way of saving the corals. It is a technology that mimics the complexity of natural reef structures, and allows to design artificial reefs that closely resemble those found in nature. This technology might offer an effective way of growing and restoring corals.

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Seawall Units

Author(s): Econcrete

Year: 2014

Location: Israel

Web: https://econcretetech.com/

ECOncrete® has designed a high texture seawall unit with a bio-enhanced concrete mix that provides suitable environmental conditions for the development of a diverse assemblage of marine flora and fauna while compiling with all the standard seawall requirements for structural performance. Monitoring was performed up to 22 months post-deployment, at which point the ECOncrete® seawall units were covered with a variety of invertebrates, including sponges, oysters, bivalves, bryozoans, and coralline algae, while the control concrete seawall presented the low-diversity assemblage, commonly associated with ports and marinas.

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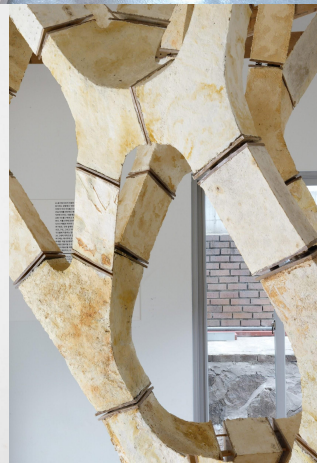

MycoTree

Author(s): Dirk Hebel and Philippe Block

Year: 2017

Location: Seoul, South Korea

Web: https://www.dezeen.com/2017/09/04/mycotree-dirk-hebel-philippe-block-mushroom-mycelium-building-structure-seoul-biennale/

Contact: dirk.hebel@kit.edu, block@arch.ethz.ch

The structure consists almost entirely of mycelium and illustrates how mushroom roots can be used to create buildings. Using the right geometry, it can provide the structure of a two-storey building. The installation consists of dozens of mycelium components that support one another in compression. These components are attached to one another with a system of bamboo endplates and metal dowels, but the mycelium is taking all the load. The project contrasts something naturally grown with high-end digital fabrication.

BUILD'S
building urban intelligent living design solutions
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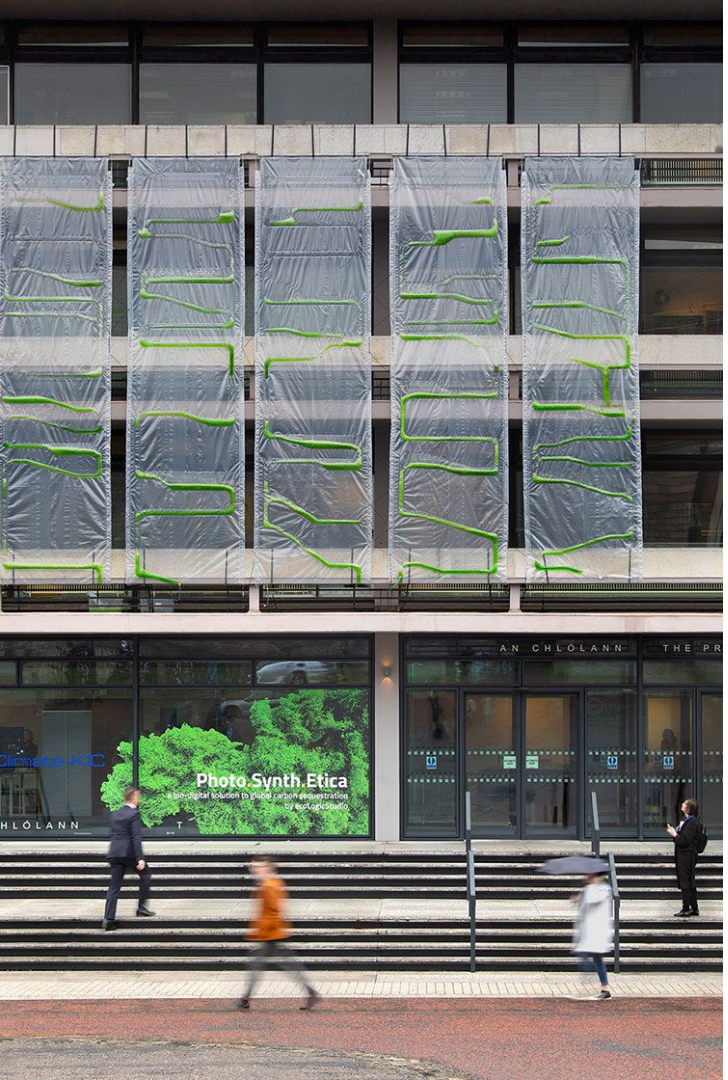

Photo.Synth.Etica

Author(s): ecoLogic Studio

Year: 2007

Location: Dublin, Ireland

Web: https://www.urdesignmag.com/design/2018/11/09/photo-synth-etica-ecologicstudio/

Contact: publications@ecologicstudio.com / +44 774 601 2757

Conceived as an “urban curtain”, Photo.Synth.Etica, captures CO2 from the atmosphere and stores it in real-time: approximately one kilo of CO2 per day, equivalent to that of 20 large trees. Composed of 16, 2 x 7 metre modules, the unique curtain prototype envelopes the first and second floor of the main façade of the Printworks building at Dublin Castle. Each module functions as a photobioreactor, a digitally designed and custom made bioplastic container that utilizes daylight to feed the living micro-algal cultures and releases luminescent shades at night.

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