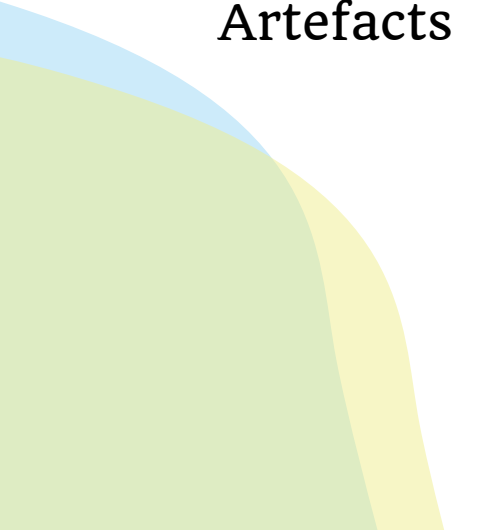


Human-Nature Connectedness through Living Artefacts



Design Guidelines

This card set is meant as guidelines for 'living artefact'-designers to create designs with a high human-nature connectedness. You can apply the cards throughout your design process to your design ideas, concepts & prototype(s).

Part 1(A-G1): If the answer is yes to one or more questions, then you can apply the pathway. It is recommended to choose two to three pathways, in order to create a strong design. It can be possible to apply all of the pathways.

Part 2(A-G2): Select the pathways chosen in Part 1. Use the guiding questions to create and adapt your design(s). And view the accompanying example cards for inspiration.

Made by Dawn Verkerk

A1. Living Aesthetics

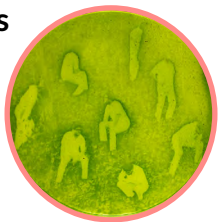


- Does the artefact contain natural characteristics (shapes & colors etc)?
- Is it an artistic artefact?
- Is it a wearable object?

Examples of Living Artefacts

Algae graphs

(Lia Giraud & Claude Yéprémian, 2014)



Flavorium

(Groutars & Risseeuw et al., 2022)

B1. Interactions



- Is there space for interaction?
- Is it part of the urban landscape?
- Can humans engage with the artefact in an artistic way?

Examples of Living Artefacts

Airbubble

(*ecoLogic
Studio,
2021*)



Living light lamp

(Nova Inno-
va team &
Plant-e team,
2023)



C1. Affective Response



- Is there possibility for people to create an emotional attachment to it?
- Can the artefact be shared by loved ones or a community?
- Does the artefact help create a space that represents a natural environment?

Examples of Living Artefacts

Breathing shoe

(PUMA & the Fraunhofer Institute, 2019)



Nuka Bot

(Chen. et al, 2021)

D1.

Habitabilities



- Are humans important to create a suitable habitat for the artefact?
- Are there multiple species interacting with each other?
- Does the artefact have a large effect on the local eco-system?

Examples of Living Artefacts

Biogarmentry

(Roya
Aghighi,
2019)



Genesis Ecoscreen

(L. Lawson,
2019)

E1. Care & Compassion



- Does the artefact require care from humans to stay alive?
- Does the artefact support local (urban) wild life?
- Can the artefact elicit a feeling of compassion?

Examples of Living Artefacts

Slime mould watch (Lu & Lopez, 2022)



Living wall
(D. Briscoe, 2018)

F1. Views of Nature



- Is it a cultural artefact?
- Does the artefact symbolize a larger meaning?
- Can the artefact be used in common rituals, traditions or routines?

Examples of Living Artefacts

**Urban
Algae
Canopy**
(*ecoLogic
Studio,
2015*)



**Living
Cocoon**
(*Loop-
biotech,
2023*)

G1. Ecological Knowledge

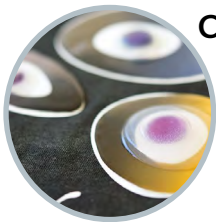


- Does the level of pre-existing knowledge about ecology affect the use of the artefact?
- Can the user(s) learn something about ecology through the use of the artefact?
- Can the artefact play a role in education?

Examples of Living Artefacts

Bio.Bolla

*(ecoLogic
studio,
2023)*



Carbon Eaters

*(PUMA + MIT
Design Lab,
2018)*

A2. Living Aesthetics



- Does the artefact look like it is alive and living?
- How does the artifact change and evolve over time?
- How is the livingness expressed in the physical attributes to see (feel, smell, hear or taste)?

A2. Living Aesthetics



- How is the user's attention pulled towards the living characteristics of the artefact?
- How can certain livingness, that is not viewable to the human eye, be surfaced?

B2. Interactions



- How can you invite the user to interact with the living species?
- How can you make sure that people mindfully pay attention to the interaction through multiple senses?

B2. Interactions



- Should the living artefact suggest the interaction or should this be mediated by another object/medium?
- Can you let humans engage with the artefact and living species in an artistic manner?

C2. Affective Response



- How can you bring the user(s) attention towards the positive emotions that they feel due to the natural species?
- What are motivations to buy, or interact with the artefact?
- How can you create an emotional bond between the artefact and user?

C2. Affective Response



- Can people adjust the artefact to suit their needs, express themselves and develop their self concept?
- How can you show the added function for the user and/or their environment?

D2.

Habitabilities



- What role do the different species and users have in maintaining a functioning first habitat (within the artefact)?
- What is needed around the artefact to help create a good habitat for the aimed at species and how can the user(s) play a role in this?

D2.

Habitabilities



- How do the elements and species in the artefacts environment influence each other and the artefact?
- How does the artefact make users aware of the shared habitat for multiple species besides themselves?

E2. Care & Compassion



- Can the artefact offer a reciprocal relationship with humans?
- How can the artefact elicit empathy and/or compassion (eg. anthropomorphising)?
- How can you make the caretaking fun, easy and/or leave room for experimentation?

E2. Care & Compassion



- How can you communicate the needs & wants of the artefact/species to the caretaker(s)?
- How can you integrate the caretaking into the daily/weekly routine, and into the household/community (eg. remind the user(s))?

F2. Views of Nature



- Can the artefact change peoples view of nature; from an anthropocentric view to a non-anthropecentric interdependance view?
- Can the artefact make humans think of the larger meaning that nature has in their life and in society?

F2. Views of Nature



- Can natural occurrences, cycles and signs of life be celebrated through the (use of the) artefact?
- Do the natural species in the artefact symbolize something in nature/life?
- Is the living species used in a cultural activity to bring meaning to the life of the user(s)?

G2. Ecological Knowledge



- What ecological knowledge does the user have and which knowledge will be thought through using the artefact?
- What is important for user(s) to become aware about nature through the use of the artefact?

G2. Ecological Knowledge



- Can you let user(s) learn knowledge/ gain awareness in an interactive, fun & personal manner?
- Can you integrate the learning into the user(s) regular routine?
- How can you evoke a curious attitude towards nature via the artefact?



Carbon Eaters

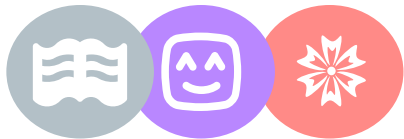
*PUMA + MIT Design Lab,
2018*

Example
Ecological
Knowledge



A t-shirt with microbially-activated stickers that respond to the CO₂ in the environment by changing color to inform users about the quality of air around them. The awareness of air quality is integrated into the users daily run in a fun manner.

Relevant pathways





Bio.Bolla

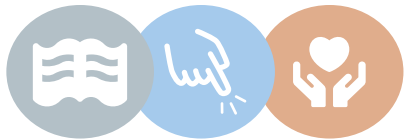
ecoLogic studio, 2023

Example
Ecological
Knowledge



A biotechnological interactive furniture that enables haptic stimulation. The furniture brings to both employees and visitors of the hospital a valuable educational experience learning about microalgae through the power of observation, play and interaction.

Relevant pathways





Living Cocoon

Loop-biotech, 2023

Example
Views of
Nature



A living coffin made from mycelium that allows human to become part of the natural cycle of life and enrich nature. This artefact celebrates the cycles of nature and adds meaning to the end of life of humans and their loved ones.

Relevant pathways





Urban Algae Canopy

ecoLogic Studio, 2015

Example
Views of
Nature



The transparency, color and shading potential of the canopy is the product of the interrelationships between climate, micro-algae, visitors and digital control systems. The canopy shows the meaning of micro-algae in our life and the interdependencies of nature, humans and technology in our society.

Relevant pathways





Living wall

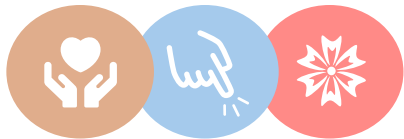
D. Briscoe, 2018

Example
Care &
Compassion



A living wall that serves as a bio-habitat. The native plants were chosen to attract and provide shelter for many animal species. After installation a building information modelling workflow is used to monitor the biological species, therefore making the caring experience easier and more interactive.

Relevant pathways





Slime mould watch

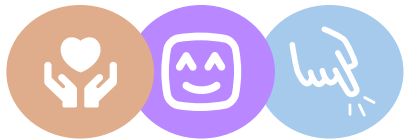
Lu & Lopez, 2022

Example
Care &
Compassion



A smartwatch with a slime mold that conducts power to a heart rate sensor, creating a living wire. The sensing depends on the health of the mold—with care, the mold becomes conductive and enables the sensor; without care, the mold dries and disables the sensor (resuming care resuscitates the slime mold).

Relevant pathways





Genesis Ecoscreen

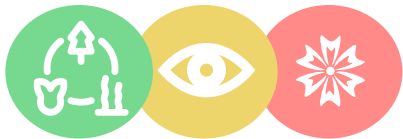
L. Lawson, 2019

Example
Habitabilities



A fully 3D printed urban biodiversity habitat made from recycled plastics. The artefact creates a product with unique characteristics specific to its environment: with ideal placement for its plants, insect habitats, and embedded channels for water flow and drainage for the setting it will be installed in.

Relevant pathways





Biogarmentry

Roya Aghighi, 2019

Example
Habitabilities



A biotextile that lives through photosynthesis, removing toxins in the air. The textile is dependent on its user for optimal growth and health, fundamentally challenging our current relationship to our clothes. Care is needed from the user to maintain a suitable habitat for the microorganisms in and around the textile.

Relevant pathways





Nuka Bot

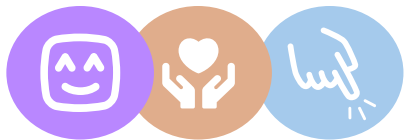
Chen. et al, 2021

Example
Affective
Response



A technologically enhanced traditional Japanese wooden bucket used to pickle vegetables using lactic acid bacteria; it is able to have conversations with humans via voice interaction. This artefact represents the user's culture and adds the function of helping remember them to care for their nukadokos.

Relevant pathways





Breathing shoe

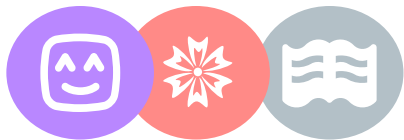
*PUMA & the Fraunhofer
Institute, 2019*

Example
Affective
Response



A shoe where microorganisms remove material based on the user's sweat and heat, creating a personal ventilation pattern. The shoe responds to the needs of the user, and the user helps the microorganisms to complete the last manufacturing step of the shoe and its functionality.

Relevant pathways





Living light lamp

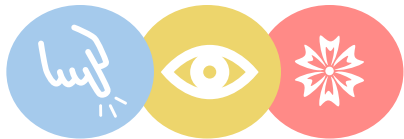
*Nova Innova team &
Plant-e team, 2023*

Example
Interaction



A lamp which harvests its energy through the photosynthetic process of the plant. The light will be activated by softly touching the plant. The available amount of energy depends on the well-being of the plant. The light created by touch will suggest further interaction.

Relevant pathways





Airbubble

ecoLogic Studio, 2021

Example
Interaction



A playground using micro-algae & technology to clean the air and mask urban noises. The purifying process is powered by solar energy and children's playfulness. Kids interact by jumping on four water foot pumps positioned on the ground while balancing on the bouncy bubbles and the internal rope system.

Relevant pathways





Flavorium

*Groutars & Risseeuw et al.,
2022*

Example
Living
Aesthetics



The users steps per day is measured by a smartwatch and translated to the humidity level inside Flavorium.

Depending on the amount of physical activity, the living monitor (with flavobacteria) will either show a rapidly expanding, brightly colored colony or one that is slowly growing and dul.

Relevant pathways





Algae graphs

Lia Giraud & Claude

Yéprémian, 2014

Example
Living
Aesthetics



A living image is made by projecting a negative image on to a Petri dish containing a microalgae culture, and then displayed at an exhibiton. The images will continue to live and evolve in the face of the hostile conditions of the exhibition: degradation, contamination, interventions by the viewer, etc.

Relevant pathways

