

PROBIOGENESIS

Exploring bio-based hybrid material embedding beneficial *S.coelicolor* bacteria for bio-receptive rebirth of architecture

Our manifest for urban greening

Our project features a **self-sustaining living system** that is not only designed for nature but collaborates with nature, contributing to the ecosystem's overall health. It originates from a rigorous studies of organisms in urban and wild environments. Below we are presenting our manifest that will lead to a successful **greening of cities** and eradicating the **heat islands**.

Water retention

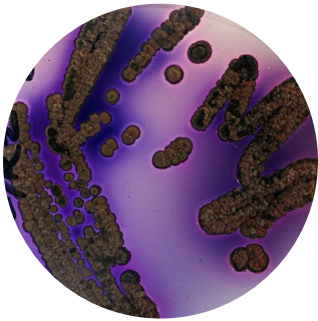
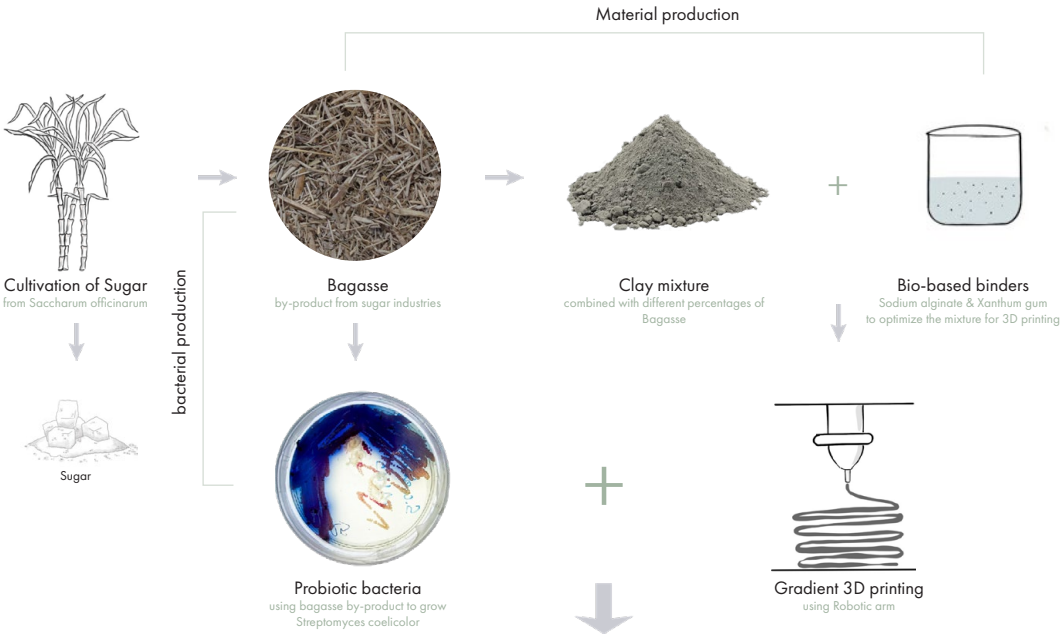
The most essential factor for organisms survival is water. Therefore, we developed a **highly porous bio-based ceramics** which is capable of high water retention.

Probiotic resilience

By merging materiality with **living beneficial microbes**, we created a fruitful ground for **photosynthetic organisms** to thrive by boosting their immune system. In return, **algae and mosses** act as **biofilters** in urban settings by filtering harmful particles such as PMx, and NOx and performing **CO2 absorption**.

Multi-species colonisation

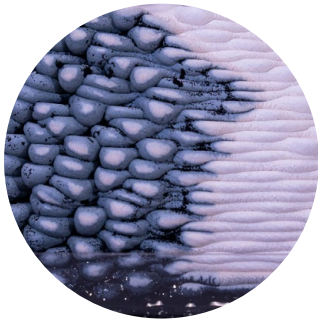
Localisation of different growth patterns allowed us to generate micro-environments for **multi-species colonisation**. Robotically 3D printed **gradient material** with different porosities fulfils the needs of different species for moisture, light and nutrient requirements.



Streptomyces coelicolor growing beneficial probiotic bacteria on substrate



Highly porous ceramic different porosities for water retention



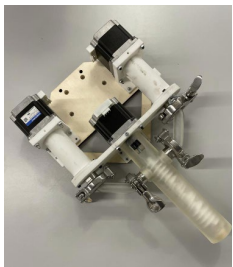
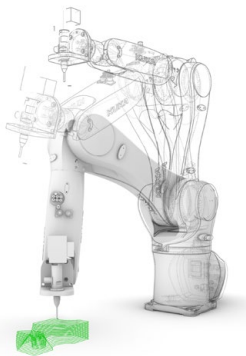
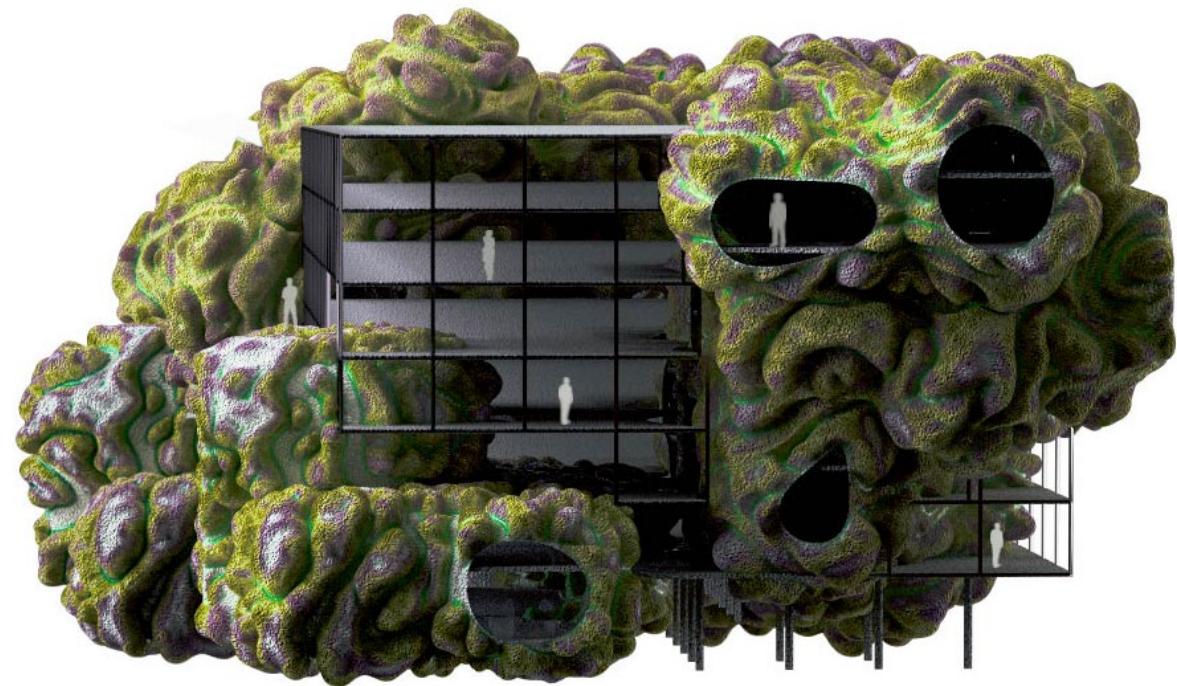
Inoculation of microbes soil microbes on 3D printed structure



Photosynthetic organisms soil microbes on 3D printed structure



3D printed gradient ceramic with textures and probiotic bacteria enhancing the moss growth



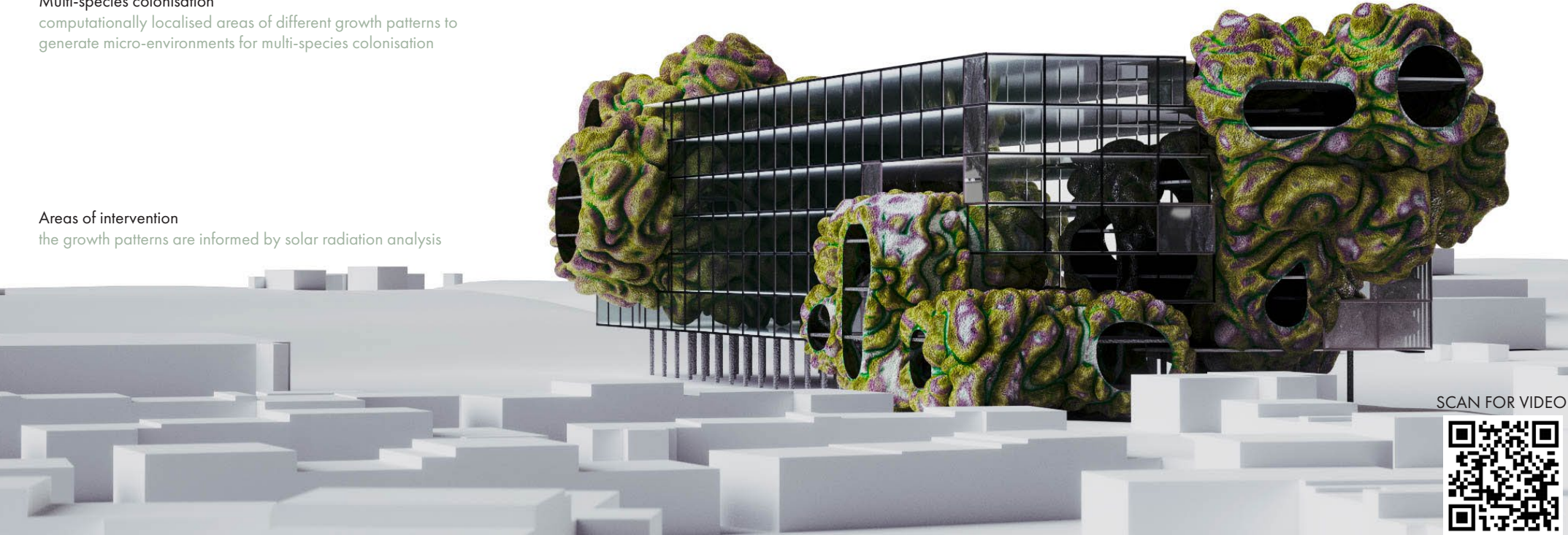
Multimatierial deposition tool computational workflow were specifically designed to achieve gradient robotic 3d printing

Multi-species colonisation

computationally localised areas of different growth patterns to generate micro-environments for multi-species colonisation

Areas of intervention

the growth patterns are informed by solar radiation analysis



SCAN FOR VIDEO



Co-funded by the European Union

