

Resilient Apocalyptic Biomimetic Architecture

05

Biomimetic Installation

Personal Project

2024.5-7

BACKGROUND

This project is interested in the relevance of biomimetic architecture in a post-apocalyptic scenario where extreme climatic conditions dominate the landscape. With soaring temperatures, strong windstorms, and dust storms continuously scouring humanity, it was necessitated by a world hidden by conventional structures.

This design initiative looks at biomimicry as part and parcel of the survival strategy..

It envisions a time in the future when architecture does follow forms, mechanisms, and even ecosystems of nature. It further integrates with the living environment in such a way that it makes a sustainable, self-sustaining habitat



RESEARCH

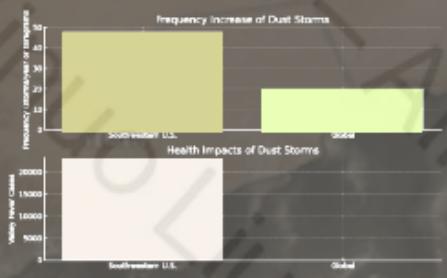
This project deals with the duality of shielding from harsh environmental conditions on one hand while, on the other, creating a symbiotic environment between human habitation and the natural world. We propose a new paradigm that building in harmony with our planet, even at the dire end of conditions, would imply rethinking design principles from the strategies and patterns of nature's time-tested intelligence.

ENVIRONMENT ANALYSIS

• Frequency Increase of Dust Storms

The bar chart shows the significant increase in dust storm frequency in the southwestern U.S. from 20 storms/year in the 1990s to 48 storms/year in the 2000s.

Globally, there are 20 teragrams of dust suspended in the atmosphere.



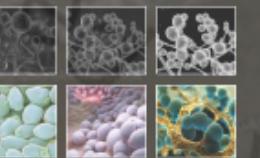
Health Impacts of Dust Storms:
The bar chart highlights the dramatic rise in Valley fever cases in the southwestern U.S., with cases increasing from 2,757 in 2000 to 22,164 in 2011.

• Satellites data research

Data from recent years indicated extreme events of weather, such as sand and dust storms, to be on the rise globally. Researchers at the UN and many environmental monitoring agencies carried out studies that show such storms are strengthening because of desertification, unsustainable agriculture practices, and climate change.

Satellites have become an important tool for the prediction and monitoring of forest fires, with advanced technologies in the imaging sector using tools like VIIRS (Visible Infrared Imaging Radiometer Suite) to provide important data that might inform safer, more adaptive architectural designs.

MINDMAP



• Design Goals

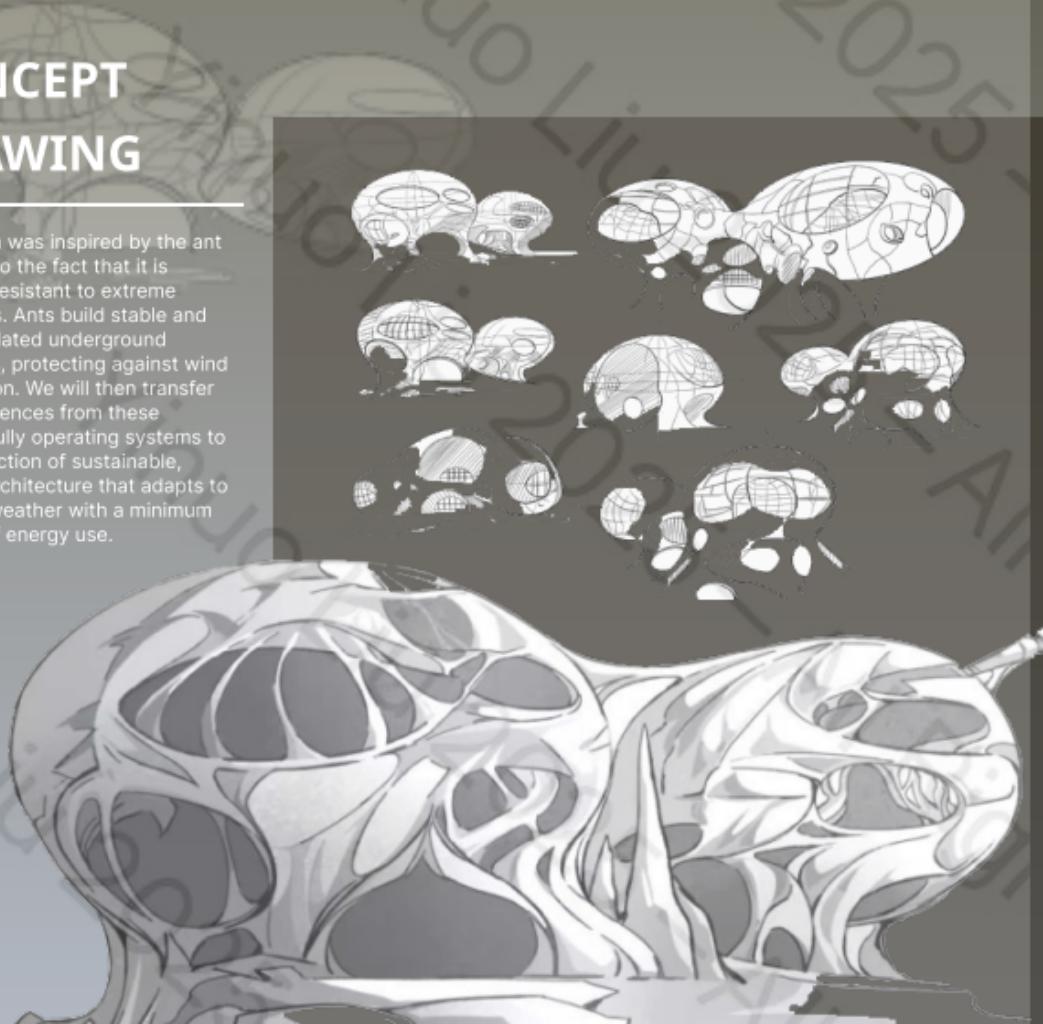
To create sustainable, durable architecture that adapts to extreme weather conditions with minimal energy use.

• Design Context

Inspired by ant nests, which are naturally resistant to extreme conditions, ants build stable and well-ventilated underground structures that protect against wind and erosion. We aim to transfer insights from these resource-efficient systems into architectural production.

CONCEPT DRAWING

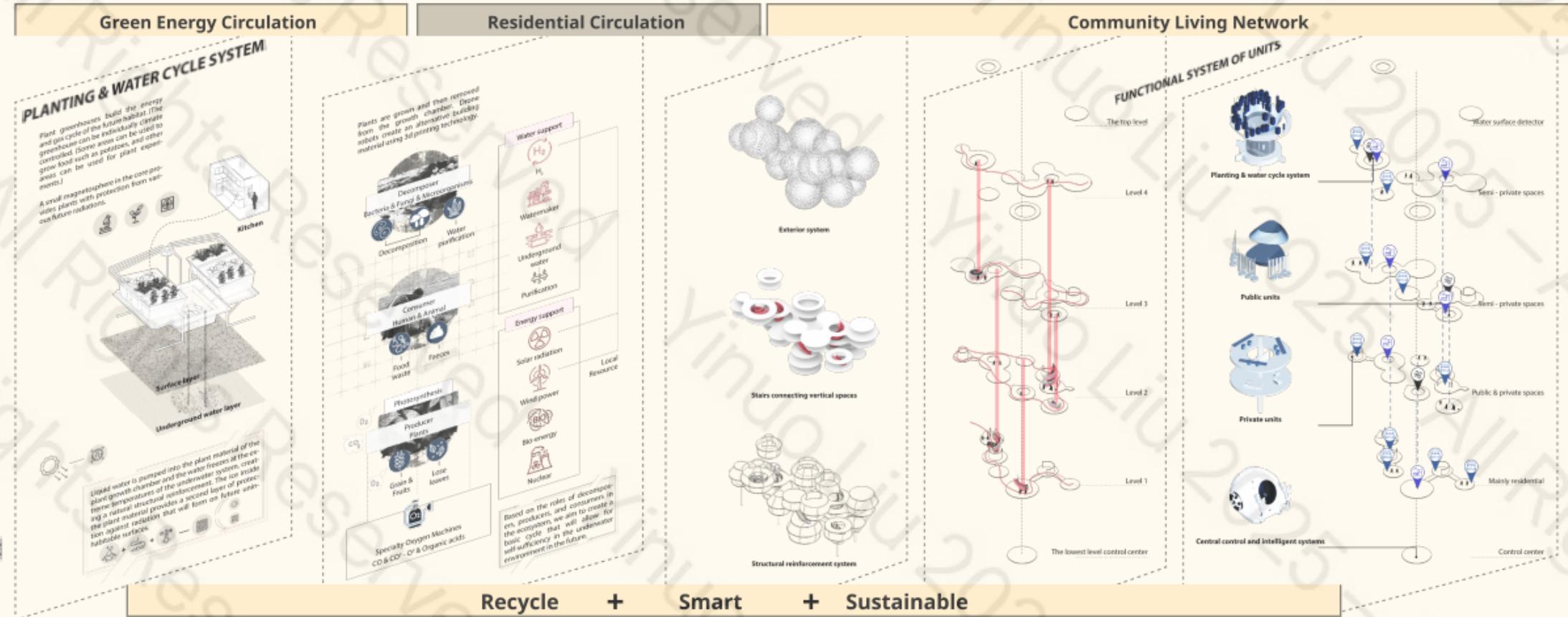
My design was inspired by the ant nest due to the fact that it is naturally resistant to extreme conditions. Ants build stable and well-ventilated underground structures, protecting against wind and erosion. We will then transfer our experiences from these resourcefully operating systems to the production of sustainable, durable architecture that adapts to extreme weather with a minimum amount of energy use.



SYSTEM DIAGRAM

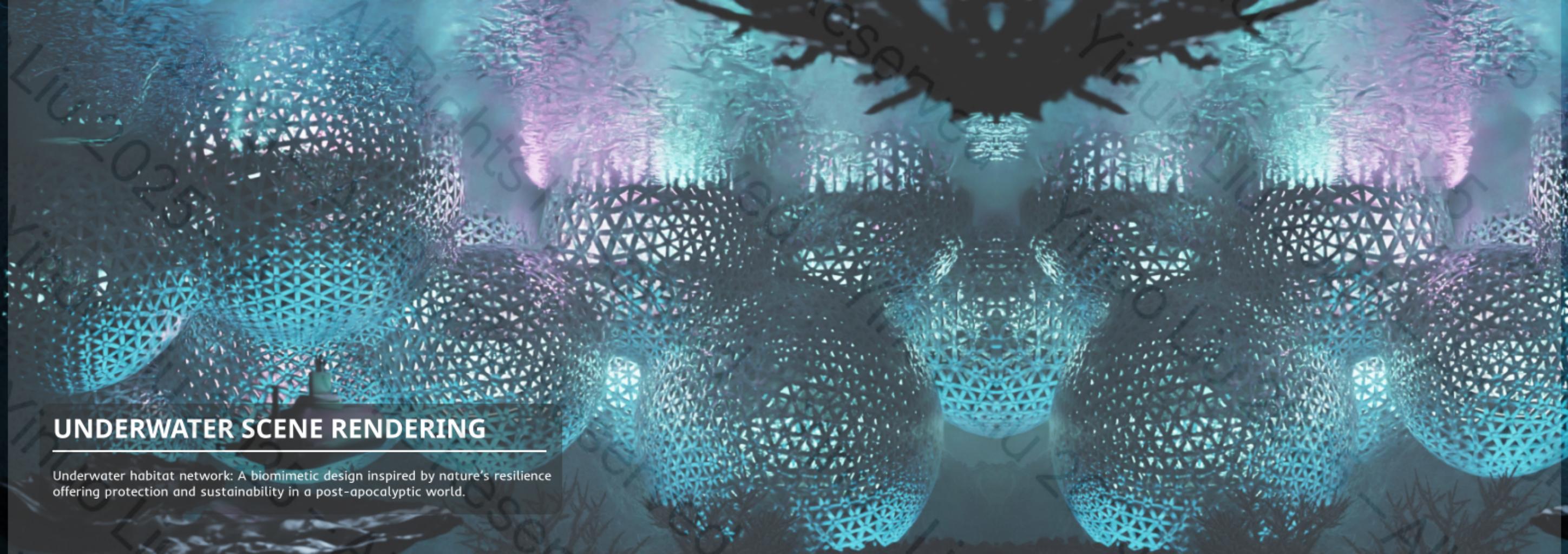
The system is divided into four parts: Planting and water system, Circulation System, Residential Pathway System, Functional system of Units, working together, forming a sustainable self-motivational architectural.

Together, these four components create a dynamic, resilient system where each element supports and reinforces the others. This synergy forms a sustainable, self-motivated architecture that adapts to its environment, reduces resource consumption, and fosters a harmonious living experience. By integrating natural systems with human-centered design, this architectural model serves as a blueprint for future sustainable developments that prioritize ecological balance and community well-being.



UNDERWATER SCENE RENDERING

Underwater habitat network: A biomimetic design inspired by nature's resilience offering protection and sustainability in a post-apocalyptic world.



SHOWCASE

