



European Project Semester

PROJECT OUTLINE

Project dates: September – December 2024

Title: AIGA – Art and science dialogue: How to face the lack of water due to climate change?

Project activity areas:

- Design and topological optimization
- 3D printing of biobased polymers
- Physical properties of printed parts
- Degradability tests in the soil

Keywords:

**Mechanical design –
Manufacturing – Polymer
science – Life Cycle Analysis**

Tutor's name and coordinates

Client – End-user: Jérémy Gobé
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Project origin

AIGA Jérémy Gobé

Project technical background:

Jérémy Gobé is a well-known French artist who received many prizes and distinctions (more information: <https://www.jeremygobe.info/>, example in *Figure 1*). In collaboration with Le Parvis (national contemporary art gallery), Jérémy Gobé lead a several-month residency at ENIT with students, researchers and teachers around the project AIGA, a scientific experiment inspired by nature to respond to contemporary ecological issues linked to the scarcity of water resources. In 2023, Jérémy Gobé's techno-artistic project, AIGA, was exposed at ENIT. It is directly inspired by the local context (scarcity of water resources, cycle management), and the know-how, skills and technologies of ENIT. The idea behind is to develop new option to save water by using underground tanks which will release water according to the plant's needs. The first scientific phase of the project was dedicated to the printing of specimens and their characterization (density, porosity, mechanical resistance to impact and flexion), and printing of prototypes. The second phase aims to go further by optimizing the design and the printing strategies to generate porosity (controlled size holes) to generate a continuous water flowing. At the end, as a proof of concept, some seeds will be sowed to follow the plant growing.



Figure 1 : Wool embroidered on fabric.3d printing in biopolymer, 2023 (from <https://www.jeremygobe.info/>)

Studied topics:

The work to be done by the students will be:

- To learn about the properties of biobased polymers
- To design underground tank and to optimize their shape and filling (topological optimization) considering the manufacturing
- To print prototypes by varying the printing parameters
- To make tests to determine their permeability and mechanical resistance
- To make tests to measure their degradation kinetics in the soil
- To sow a plant, to measure its water needs and to follow its growing