Chair of and Institute for Construction Management, Digital Engineering and Robotics in Construction
RWTH AACHEN UNIVERSITY

BTU Cottbus-Senftenberg
3D Earth Printing Summer School
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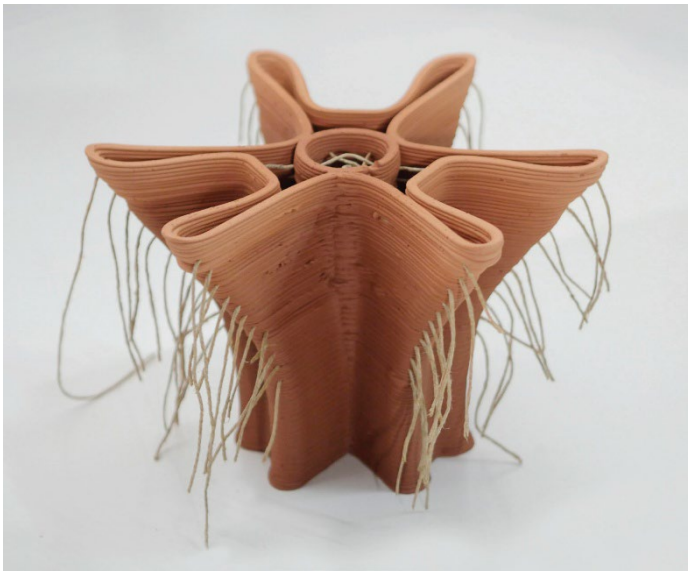
REACHING OUT – ICREASING INCLINATION BY CONTINOUS FIBRE-INFORCEMENT



Workshop Overview

This workshop explores the **integration of continuous fibre reinforcement into clay-based 3D printing** to overcome natural material limitations and enable **increased inclination angles** without heavy deformation in the green state. Through a **human-machine collaborative process** — involving **printing, strategic pauses, and fibre placement** — students will learn to push the **material to its physical limits** while developing **optimized free-form structures**. Additionally, students will prepare **fabrication-ready robotic workflows**, focusing on **form follows function** as a guiding principle.

Learning Objectives

By the end of this workshop, students will be able to:

- Understand the **fundamentals of 3D Clay printing** and green-state material behaviour
- Design digital geometries considering **maximum feasible inclination angles**
- Integrate **continuous fibre reinforcement** into clay printing strategies.
- Develop **strategic design concepts** driven by fibre placement and structural performance.
- Experiment with **iterative human-machine workflows** (printing → stop → fibre → continue).
- Prepare **fabrication documents and robotic toolpaths** for automated 3D printing.

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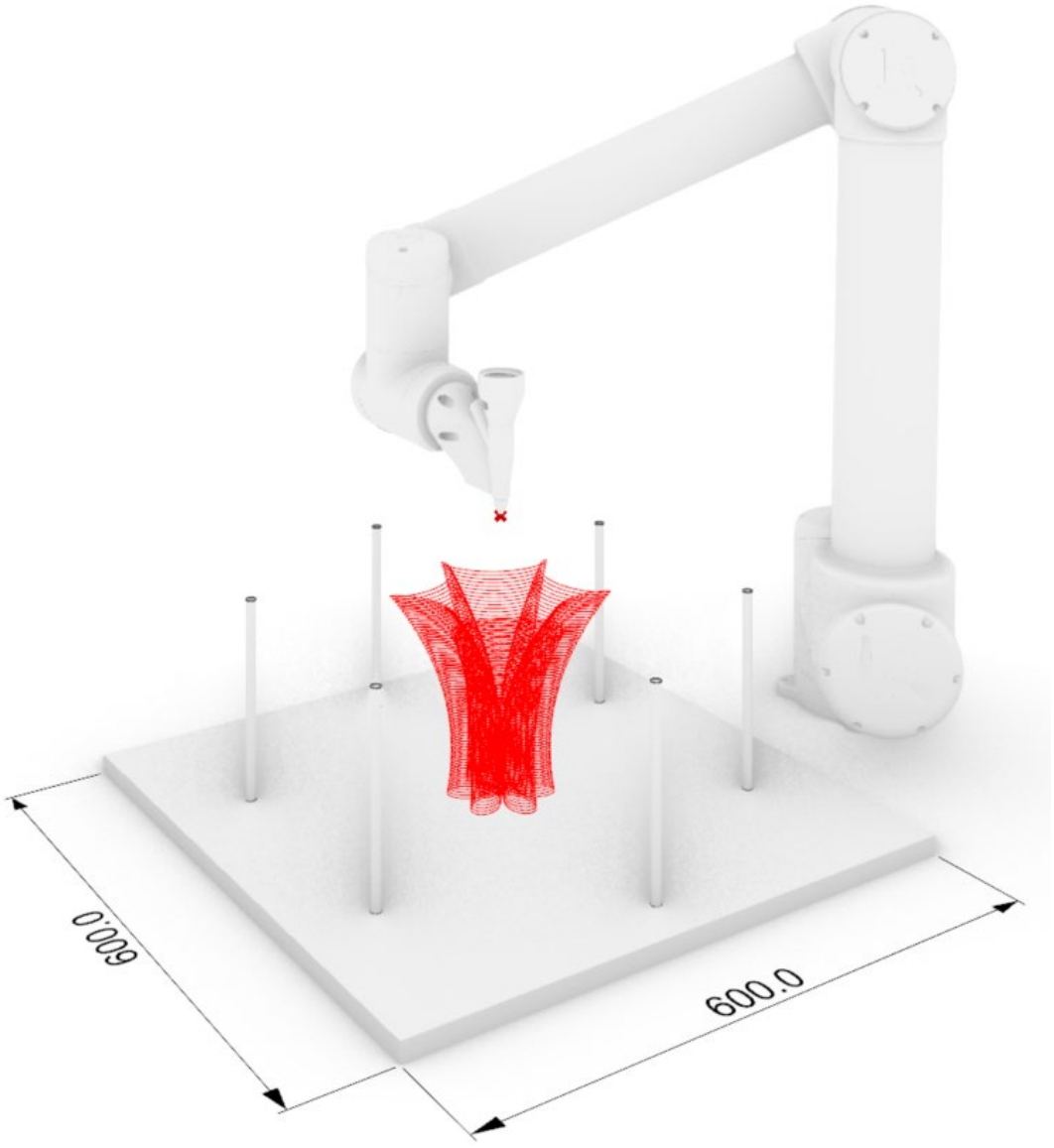
3D Earth Printing Summer School | 3D-Printing Setup



Material list:

Each group gets:

- 2 boards of MDF (600 x 600 mm)
- Timber round rods (10 mm diameter x ca. 250 mm length)
- Hemp fibre/ yarn (sufficient quantity)
- Drill and 10mm drill (to place rods for tensioning the fibre)

Shared equipment:

- UR10 robot with extruder and Lutum clay cartridge L (2 kg)