

MASTER'S THESIS

Particle orientation in extrusion-based clay 3D printing

The proposed master's thesis will investigate the influence of particle orientation in extrusion-based clay 3D printing for architectural building components. During extrusion, the plate-like clay minerals within the material tend to align along the printing direction, which may significantly influence the mechanical and structural behavior of printed elements.

Following a theoretical review of clay mineral structures and extrusion-based fabrication processes, the project will explore how printing path design and orientation affect the internal material structure and resulting performance of printed components. Experimental prototyping and testing will be used to analyze how different toolpaths and deposition strategies influence structural behavior.

The project is conceived as a collaborative research topic that may be realized jointly with master's students from the geosciences faculty at TU Graz. Existing connections between the institutes provide the opportunity for an interdisciplinary thesis combining architectural fabrication research with material analysis from the geosciences perspective.

THESIS SUPERVISOR:

Milena Stavric

DURATION:

max. 12 months

INFRASTRUCTURE:

IAM ShapeLab

ADDITIONAL SUPPORT:

Hana Vašatko, Julian Jauk, Lukas Gosch

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