

MASTER'S THESIS

Smart adaptive control for clay 3D printing in architecture

The proposed master's thesis will investigate the development of a smart and adaptive 3D printing workflow for clay-based additive manufacturing in architectural applications. Clay printing is often affected by material inconsistencies, varying moisture levels, and mechanical irregularities in the extrusion system, which can lead to uneven extrusion widths and reduced geometric precision.

Following an initial theoretical review of clay printing and process monitoring, the project will focus on developing a feedback-based control system that measures extrusion width during printing and dynamically adjusts the material flow rate. The goal is to compensate for material or machine inconsistencies in real time and ensure uniform extrusion, even when working with non-homogeneous materials.

The practical part of the thesis will include developing and testing a prototype setup that combines sensing, data evaluation, and adaptive control within an existing clay printing environment. The results aim to improve the reliability and precision of clay-based additive manufacturing and may contribute to a scientific publication.

THESIS SUPERVISOR:

Milena Stavic

DURATION:

max. 12 months

INFRASTRUCTURE:

IAM ShapeLab

ADDITIONAL SUPPORT:

Hana Vašatko, Julian Jauk, Lukas Gosch

[Image generated by ChatGPT]

I O I III