Development of powders for concrete 3D-printing

Bachelor-, studies-, master thesis

In order to automate the construction industry, 3D-printing processes are particularly suitable, as they can produce individual and complex components in small quantities at low cost. Among other things, concrete 3D-printing using selective cement activation (SCA), a powder bed process, is currently being researched. With SCA, parts can be printed with high resolution, but comparatively low part strength is currently a challenge. In order to increase the strength, the powder bed should be as dense as possible, to achieve a high amount of particle-particle contacts.

For this purpose, the particle size distribution of the powder is to be specifically adjusted by examining and evaluating approaches from the literature with regard to their applicability on the sand-cement-mixtures used for SCA printing.

Work packages:
- Literature search
- Systematic production and characterisation of powders for SCA
- Evaluation of the results and selection of suitable mixtures for 3D printing

Methods:
- Measurement of the particle size distribution
- Separating and mixing of powders
- Determination of the raw, bulk and taped density of powders
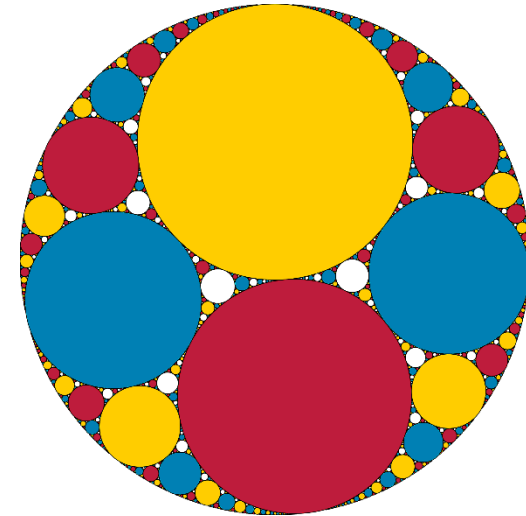
Contact:

Niklas Meier

Tel.: 0531 391-9607

niklas.meier@tu-braunschweig.de