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Studienarbeit

CT image processing

Xray computed tomography is a common tool to map the internal structure of objects. Often this is used for inspection only: is there a crack? Is the wall thickness as desired? A more complicated task is the separation of individual phases („segmentation“) in the object, e.g. cement, aggregates and air in a mortar. With contrast between phases often low more advanced techniques have been developed, e.g. the use of artificial intelligence.

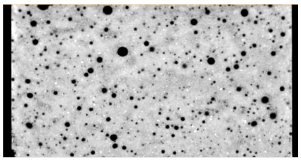

Fig. 1) Mortar exposed to iodide solution

Fig. 2) Mortar exposed to iodide solution: difference to initial condition

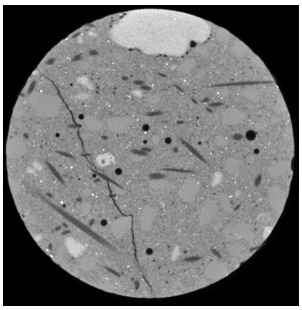

Fig. 3) Mortar with fibers and a crack

In this project, we want to investigate the usefulness of AI based segmentation on two examples: segmentation of concrete and crack detection.

Prerequisites: basic computer skills

Tasks

- Familiarize yourself with CT data and the Dragonfly [1] or iLastik [2] software
- Compare conventional and AI segmentation for concrete (cementitious phase, aggregates, pores)
- Use AI segmentation for fibers and cracks

References

[1] https://dragonfly.comet.tech/
[2] https://www.ilastik.org/