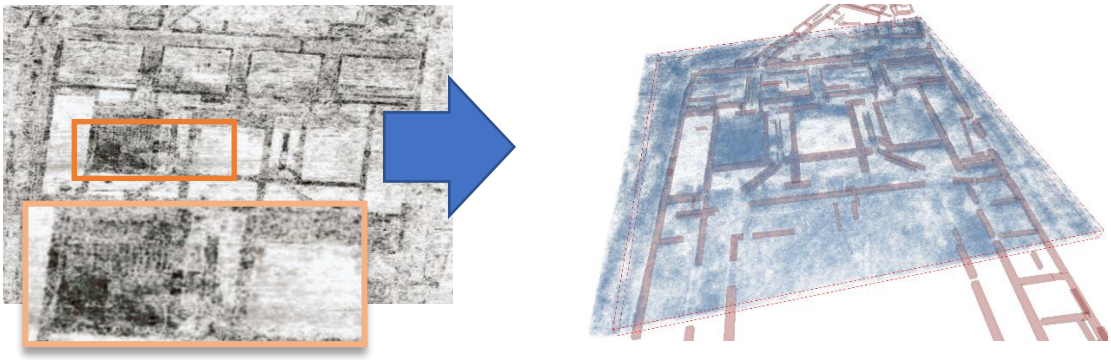

Deep learning for archaeological interpretation of GPR data

Master thesis

Topic

Ground penetrating radar (GPR) allows to record 3D data of near-surface soil regions in a non-invasive way. In archaeology, it is an invaluable tool for the non-destructive exploration of archaeological monuments and other manmade structures buried in the ground. State-of-the art mobile multi-channel GPR recording setups enable archaeologists to record square kilometres at approx. 5 cm of spatial resolution, which leads to huge datasets.

The archaeological interpretation of such datasets is challenging for various reasons, like the limited spatial resolution and the susceptibility of the acquisitions process to environmental influences. Furthermore, structures of interests degrade over time due to, e.g. erosion and human intervention. Currently, the time-consuming interpretation of GPR data is performed by experts, which cannot keep pace with the increasing amount of data.

The aim of this project will be to investigate the applicability existing deep convolutional network (DCNN) architectures to GPR data by adapting and training them to detect the remains of man-made structures. Moreover, a software toolbox for efficient handling of practical datasets should be developed.

Qualifications

- Knowledgeable with TensorFlow and Python
- Interest in machine learning and computer vision

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Note: Compensation is negotiable