

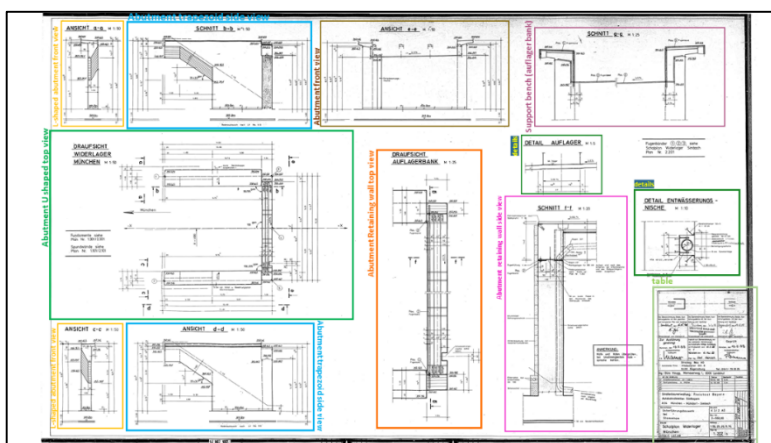
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Digitalization of Technical Drawings using Deep Learning

Description

Building Information Modeling (BIM) has been widely used for supporting different construction tasks. These models can facilitate the operation and management process of structures during their service life. Technical drawings are one of the sources based on which a BIM can be generated. However, the modeling process from these drawings is labor-intensive, error-prone, and costly. This project aims to digitalize structural drawings of buildings and bridges using deep learning and image processing methods. As the main part of the project, a deep learning model is trained for the detection of numbers in drawings. Depending on the model, techniques



such as transfer learning and fine-tuning might be tested on the model. Finally, Optical Character Recognition (OCR) is applied to the resulting bounding boxes from the trained model for digitalization of numbers. This project is mainly based on machine learning, more specifically, deep learning. Therefore, minimum knowledge of python and simple machine learning models is required. Any familiarity with Tensorflow or Pytorch, as machine learning platforms, is advantageous as well.

Task

Implement a deep learning model to digitalize the content of technical drawings:

- Get to know with scene text detection task.
- Get familiar with tensorflow.
- Annotation of the technical drawing of bridges and buildings.
- Train a YOLO [1, 2] model for the scene text detection task.
- Use OCR for digitalization of the detected texts and numbers.

Supervisor

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References

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- [2] Redmon, J. and A. Farhadi, *Yolov3: An incremental improvement*. arXiv preprint arXiv:1804.02767, 2018.