Modern databases for image understanding provide labels of different levels ranging from pixel-wise object labels, to bounding boxes, to image labels. While pixel-wise labels are the strongest and most informative supervision signal, they are costly to obtain. On the other hand, whole images are easier to be labelled to contain a certain object or not.

The goal of this thesis is to exploit the assumption that the background of an object shows an higher variance than the object itself in different images. Based on this premise, it is possible to detect and segment the object within the image without a precise pixel-wise labelling.

Keywords: Semantic segmentation, object detection

Involved tasks:
- Literature research
- Data collection (e.g. based on public databases)
- Implementation of a method able to detect objects in weakly annotated images

(Recommended) requirements:
- Good knowledge about digital image processing (e.g. attendance in lecture DIP)
- Good knowledge about machine learning (e.g. attendance in lecture AIA)
- Good programming skills (e.g. C++)

Language: German / English