Object detection algorithms are essential components for perceiving the environment in safety-critical systems like automated driving. However, current state-of-the-art algorithms based on deep neural networks can give high confidence values to falsely detected objects and it is therefore important to model uncertainty for these predictions. In this paper, we propose two aleatoric uncertainty estimation algorithms for state-of-the-art deep learning based object detectors. Established algorithms for estimating uncertainty can either not be directly applied to object detection networks or result in high inference times. Instead, we adapt an existing method for aleatoric uncertainty estimation and propose another simple and efficient algorithm which is directly based on the multi-box detections. We show that these methods are able to assign high uncertainty values to false positives and visualize these in uncertainty maps. The uncertainty estimation methods are applied to a neural object detector and are compared with respect to their accuracy and inference time.
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