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DEPARTMENT OF STATISTICS

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Applications of Generative Models in Deep Learning

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ABSTRACT

Generative models provide a different angle to tackle machine learning problems in contrast to pure discriminative deep learning algorithms. This thesis proposal introduces Detection Selection Algorithm (DSA), one application of generative models in the field of object detection. DSA is used after non-maximum suppression (NMS) of some type is applied to the detections of a feed forward detection network. Its goal is to find the exact number of objects, their labels in the image, and their visible support. DSA greedily selects a subset of the detected bounding boxes, together with their full reconstructions, that provides the interpretation of the whole image with highest likelihood, taking into account object occlusions. DSA with NMS or Soft-NMS can achieve significantly better results than NMS or Soft-NMS themselves, as is illustrated in my experiments on synthetic images with multiple 3d objects.