Supplementary Material: Generative Modeling for Small-Data Object Detection

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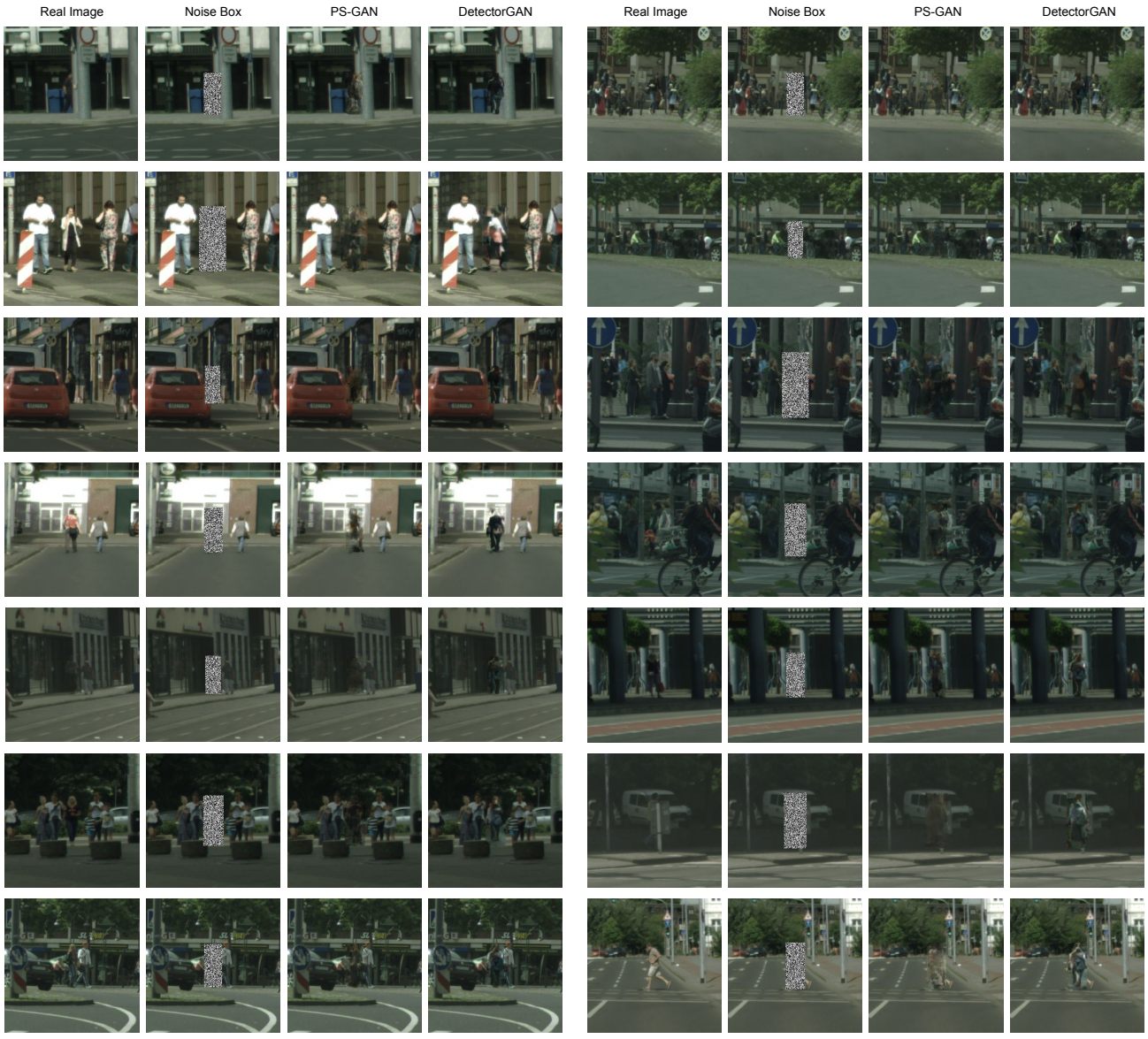

Figure 1: Examples of generated images from PS-GAN and DetectorGAN. We observe qualitative improvement for pedestrian detection.

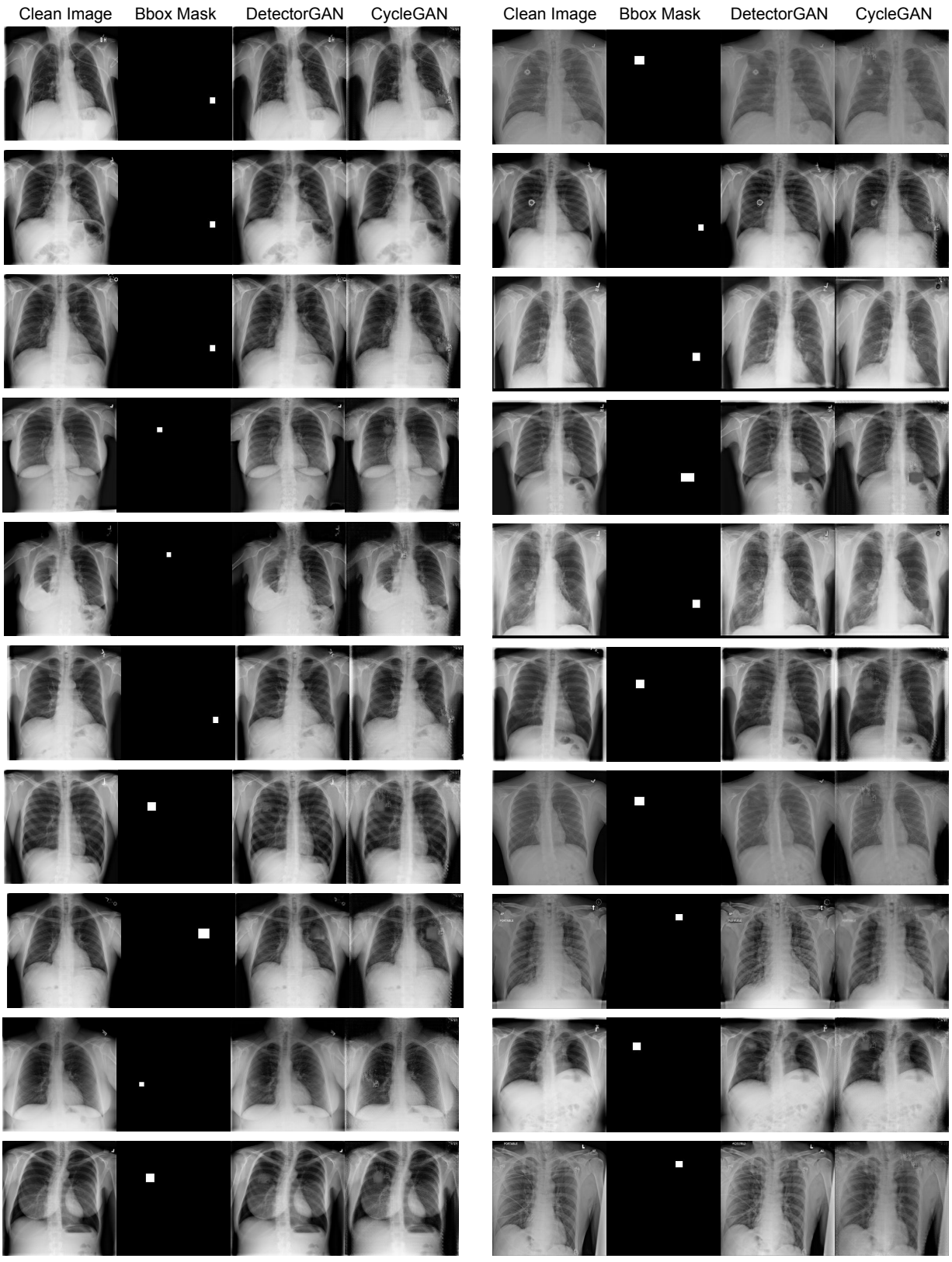

Figure 2: Example generated images from CycleGAN and DetectorGAN for NIH. Both methods generate synthetic images from clean images and bounding box masks. DetectorGAN generates nodule inserted images with better visual quality.

1. Additional Visualization

We show additional visualization—examples of generated object-inserted images as in Fig. 1 and Fig. 2. We observe that images are much better in terms of less artifacts and better blend-in.

2. Benefits of Generating Training Data

To explore how increasing the amount of data affects the detection performance, we vary the number of training images in NIH and evaluate the accuracy shown in Table 1. We observe constant improvement with more labeled training data, which demonstrates the value of our work in generating synthetic labeled training data.

Table 1: The effect of training data size on AP on NIH.

#images	20	30	40	50	57 (max)
AP	0.025	0.067	0.086	0.111	0.124