Title: Effective Use of Synthetic Data for Urban Scene Semantic Segmentation

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Abstract:

Training a deep network to perform semantic segmentation requires large amounts of labelled data. To alleviate the manual effort of annotating real images, researchers have investigated the use of synthetic data, which can be labelled automatically. Unfortunately, a network trained on synthetic data performs relatively poorly on real images. While this can be addressed by domain adaptation, existing methods all require having access to real images during training. In this paper, we introduce a drastically different way to handle synthetic images that does not require seeing any real images at training time. Our approach builds on the observation that foreground and background classes are not affected in the same manner by the domain shift, and thus should be treated differently. In particular, the former should be handled in a detection-based manner to better account for the fact that, while their texture in synthetic images is not photo-realistic, their shape looks natural. Our experiments evidence the effectiveness of our approach on Cityscapes and CamVid with models trained on synthetic data only.

Why did I choose this paper?

- The proposed approach uses synthetic data-only for the training dataset;
- It is also tested the use of unlabelled real images at training time;
- At test time, the proposed approach is evaluated also on real images from the CityShapes and CamVid datasets.

Reference:

Saleh F.S., Aliakbarian M.S., Salzmann M., Petersson L., Alvarez J.M. (2018) Effective Use of Synthetic Data for Urban Scene Semantic Segmentation. In: Ferrari V., Hebert M., Sminchisescu C., Weiss Y. (eds) Computer Vision – ECCV 2018. ECCV 2018. Lecture Notes in Computer Science, vol 11206. Springer, Cham. https://doi.org/10.1007/978-3-030-01216-8_6.