

Weekly Report

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Abstract—This week I mainly put my effort on studying for the PRML class test and reading a paper about using DNN in building extraction of SAR image.

I. PAPER READING

IN this research, they investigate the potential of deep learning methods for a large amount of data, and present here our preliminary semantic segmentation results for high resolution SAR and optical images, based on deep learning methods. Specifically, their dataset contains over 6000 image patches with a size of 200x200 pixels, which are labeled by four categories: building, natural, landuse and water. They are particularly interested in the extraction of buildings. They plan to experiment on different deep learning models, and modify the networks architecture as well, in order to see their effects on getting more accurate segmentation results. Moreover, with multiple sources of knowledge, they study the characteristics of SAR models.

They choose the well-known fully convolutional networks (FCN), together with 50 layer deep residual networks and Atrous convolution networks for their experiments. In conclusion, the following points show our main contributions:

- They introduce a heterogeneous dataset which consists of TerraSAR-X imagery, Google Earth optical imagery, OpenStreetMap data for pixel-wise semantic segmentation with four categories.
- They build optical models and SAR models, based on deep learning Fully Convolutional Networks (FCN) and Deep Residual Networks learning scheme.
- They study SAR models (i.e., feature maps) by combining multiple data sources: Google Earth images and OpenStreetMap data.

Fig. 1 are image patches from heterogeneous data sources. Fig. 2 is the building example of Google Earth Patch Result and TerraSAR-X Patch Result.



Fig. 1: Image patches from heterogeneous data sources.

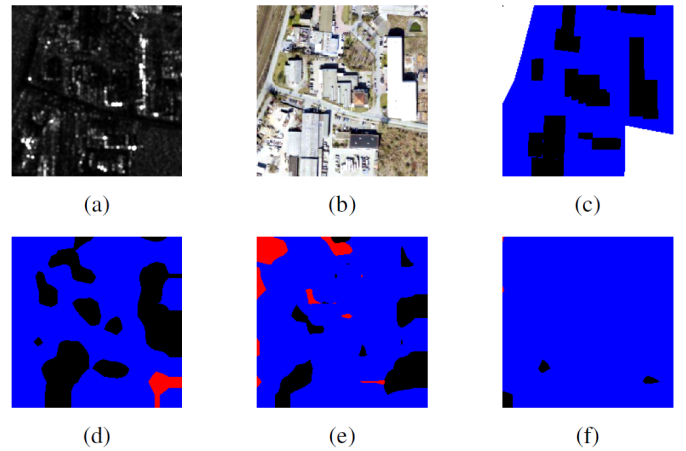


Fig. 2: Building example of Google Earth Patch Result and TerraSAR-X Patch Result. (a) TerraSAR-X Patch. (b) Google Earth Patch. (c) OpenStreetMap Patch. (d) Google Earth Patch Result with 250 Epochs. (e) TerraSAR-X Patch Result with 750 Epochs. (f) TerraSAR-X Patch Result with 1000 Epochs.