# Hierarchical Co-segmentation of Building Facades
# - Supplementary material -

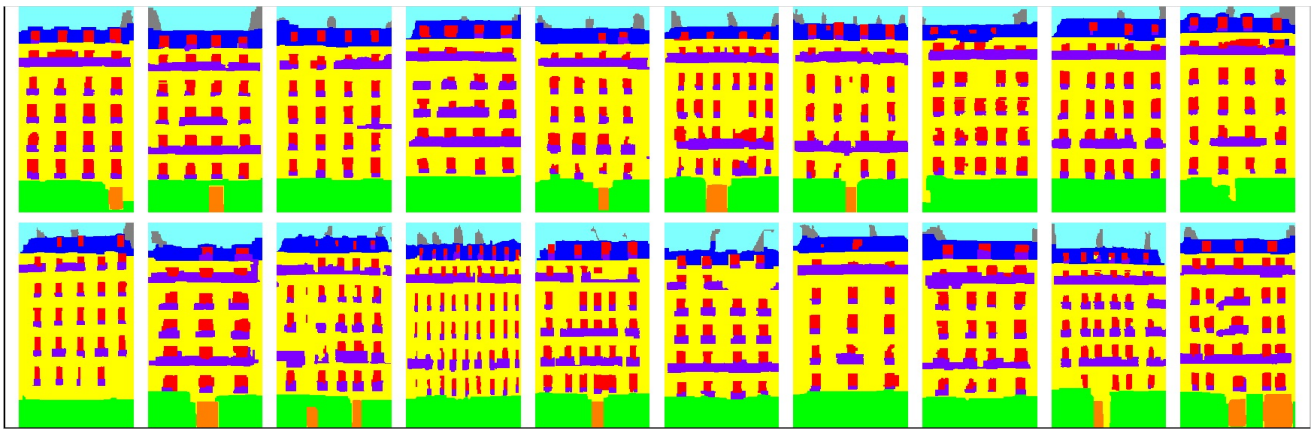
Anđelo Martinović and Luc Van Gool
ESAT-PSI/VISICS, KU Leuven
andelo.martinovic@esat.kuleuven.be, luc.vangool@esat.kuleuven.be

## 1. Hierarchical co-segmentation results

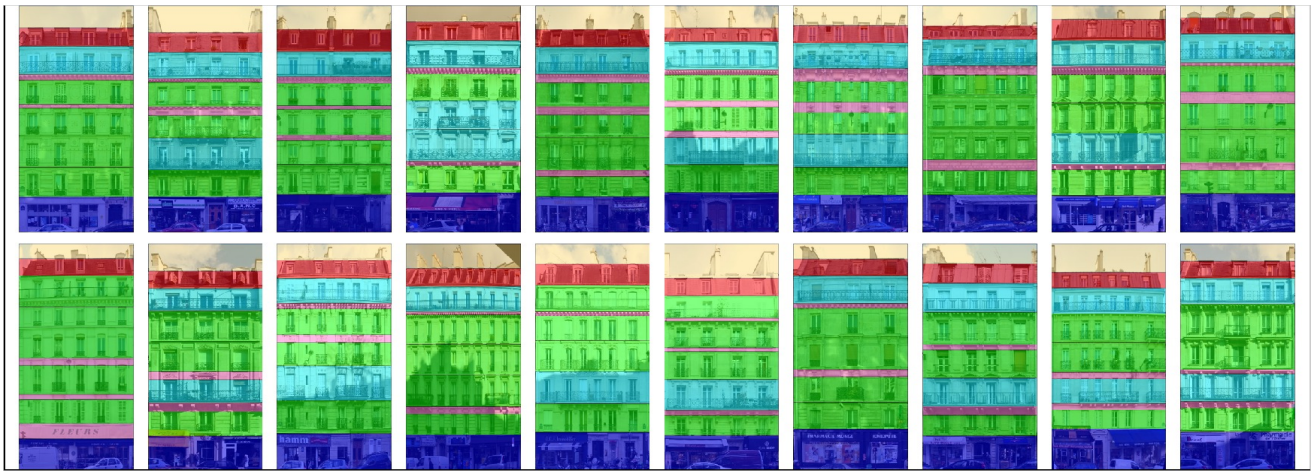
We show the full results of our hierarchical co-segmentation approach on the ECP dataset [3], and on a smaller test case of the Grunderzeit dataset [2]. We visualize the segmentation masks induced by the hierarchical segmentation at each level of the hierarchy (up to 3). Clusters of similar elements are overlayed with the same, randomly selected color (hence different colors in different folds). Each of these clusters is then jointly segmented in the next level of the hierarchy.

### 1.1. ECP dataset

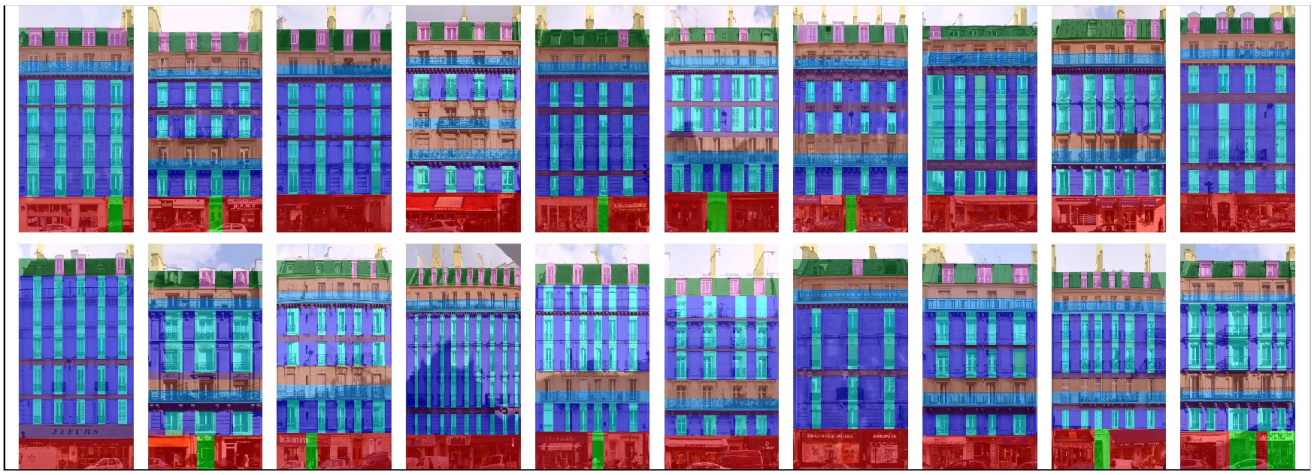
We use a 5-fold train-test split, with 80 images to train the supervised classifier [1] and 20 to test the co-segmentation.
**Fold 1 - Input images and supervised classifier output**



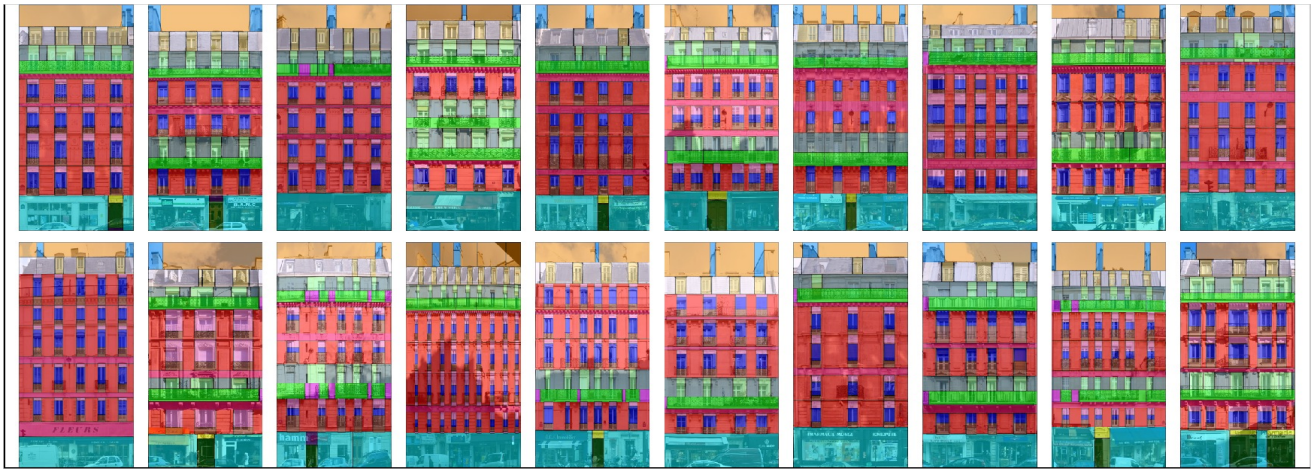
**Fold 1 - Segmentation - Hierarchy - Level 1**



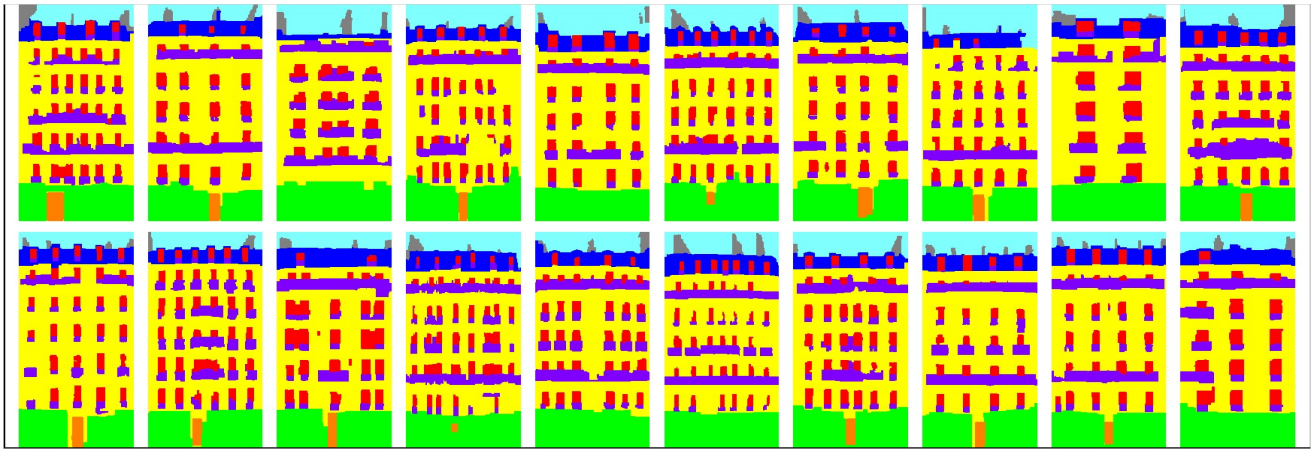
**Fold 1 - Segmentation - Hierarchy - Level 2**



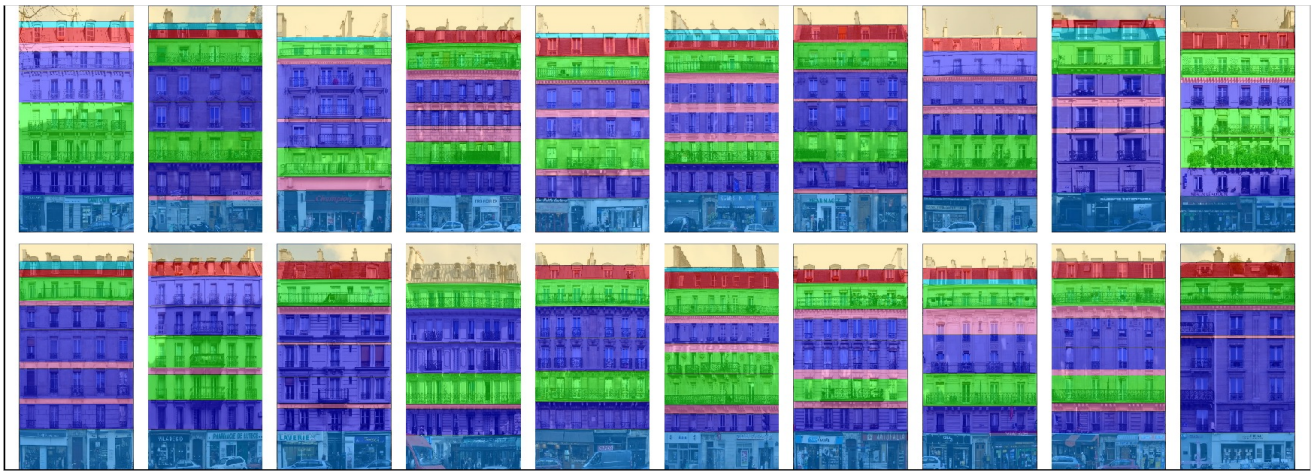
**Fold 1 - Segmentation - Hierarchy - Level 3**



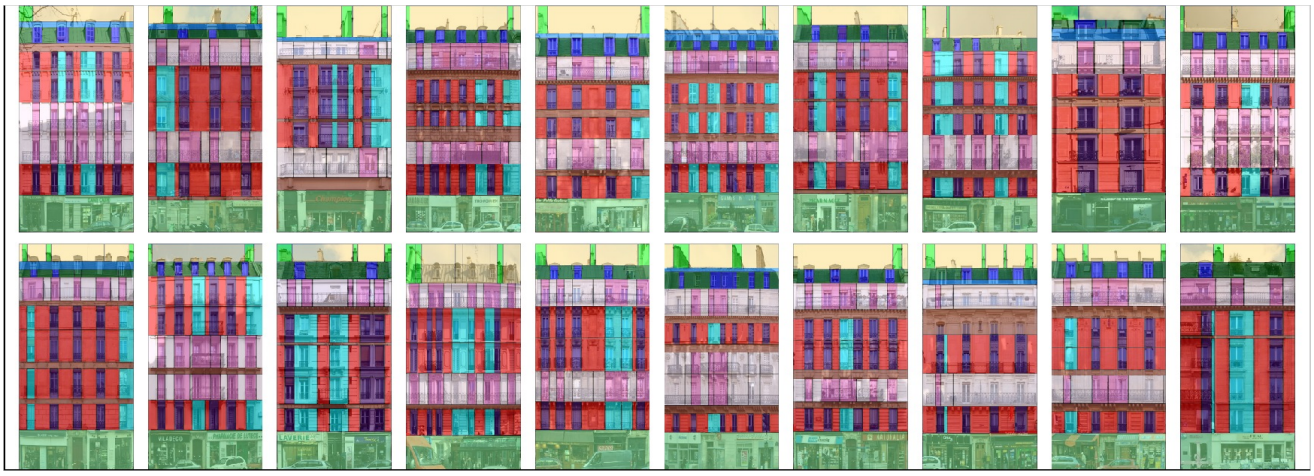
**Fold 2 - Input images and supervised classifier output**



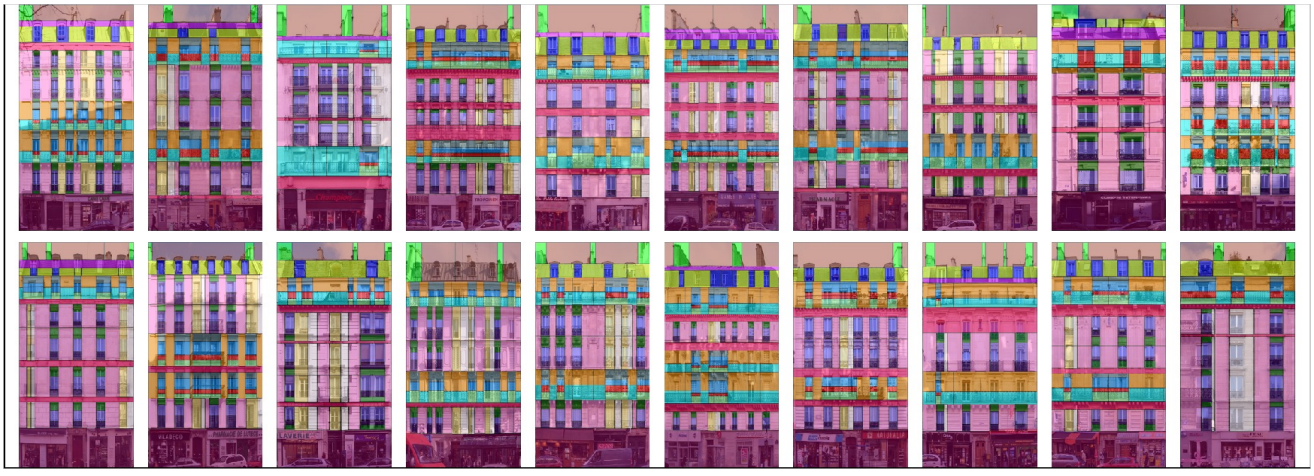
**Fold 2 - Segmentation - Hierarchy - Level 1**



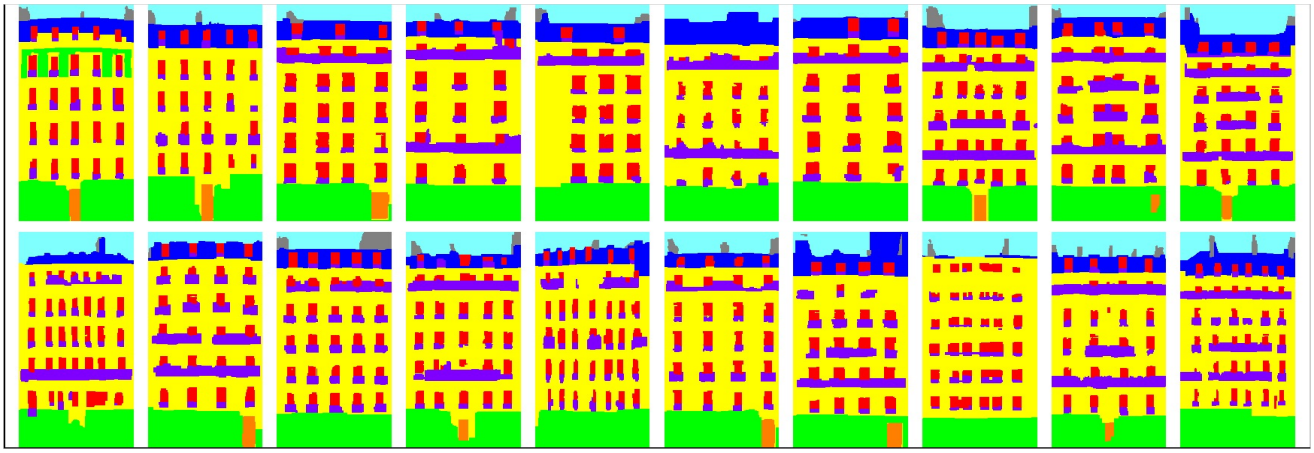
**Fold 2 - Segmentation - Hierarchy - Level 2**



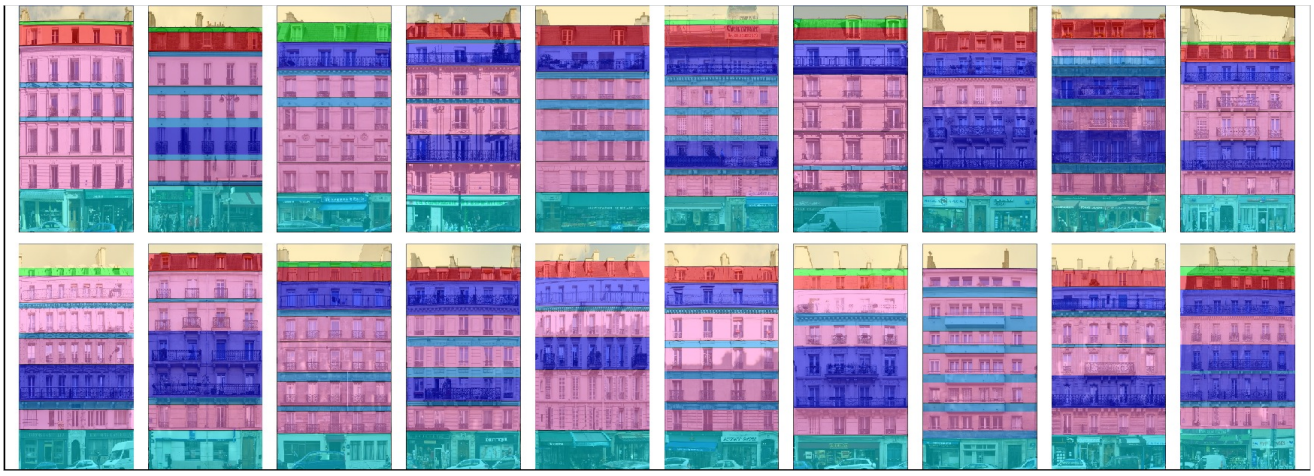
**Fold 2 - Segmentation - Hierarchy - Level 3**



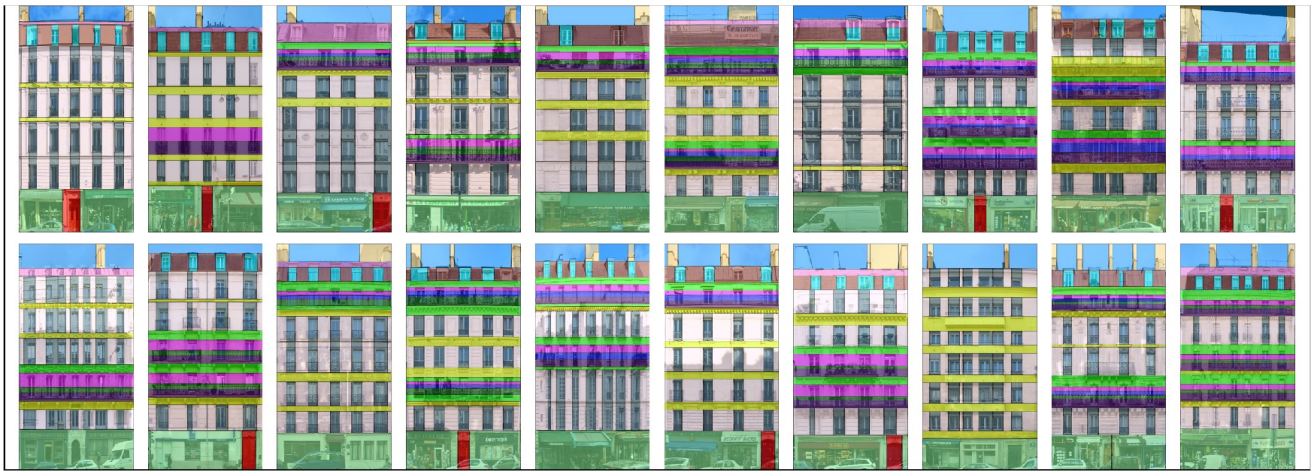
**Fold 3 - Input images and supervised classifier output**



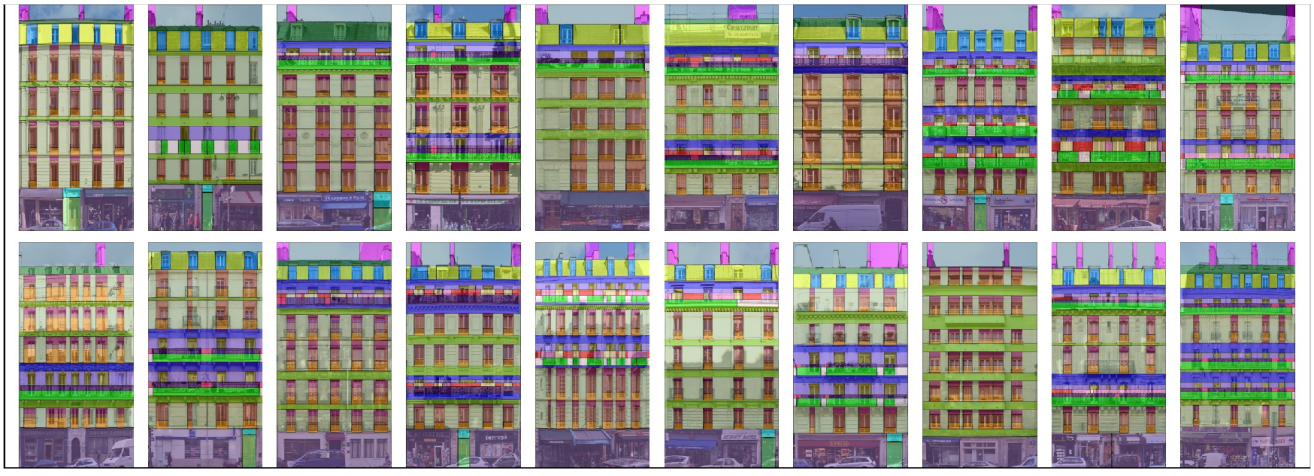
**Fold 3 - Segmentation - Hierarchy - Level 1**



**Fold 3 - Segmentation - Hierarchy - Level 2**

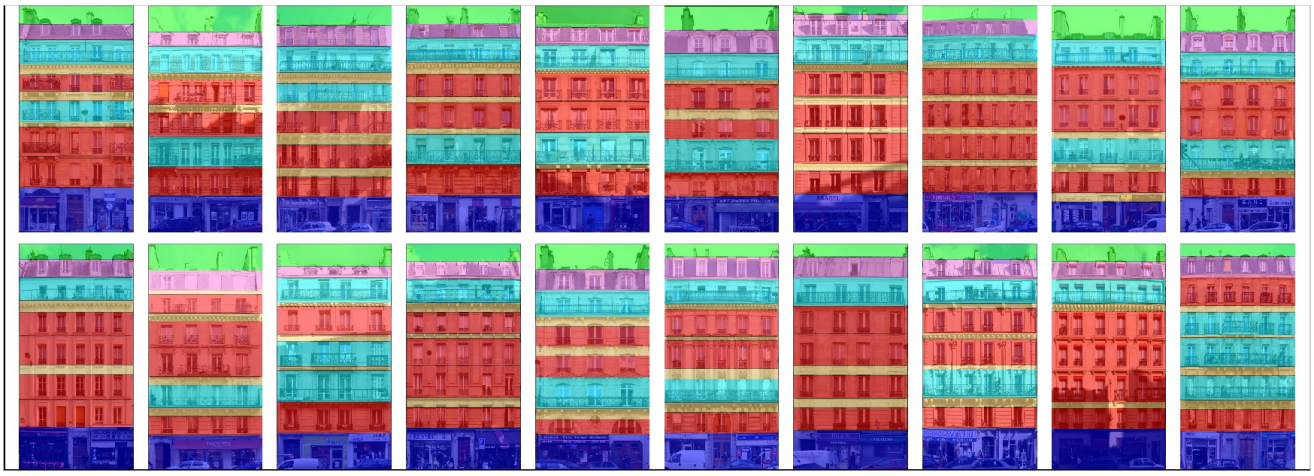


**Fold 3 - Hierarchy - Level 3**

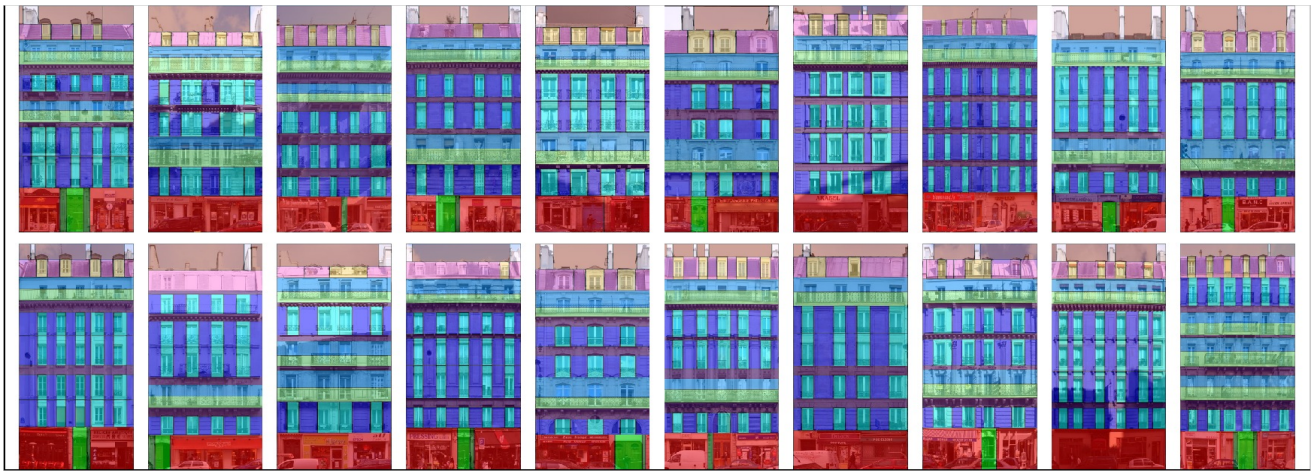


**Fold 4 - Input images and supervised classifier output**

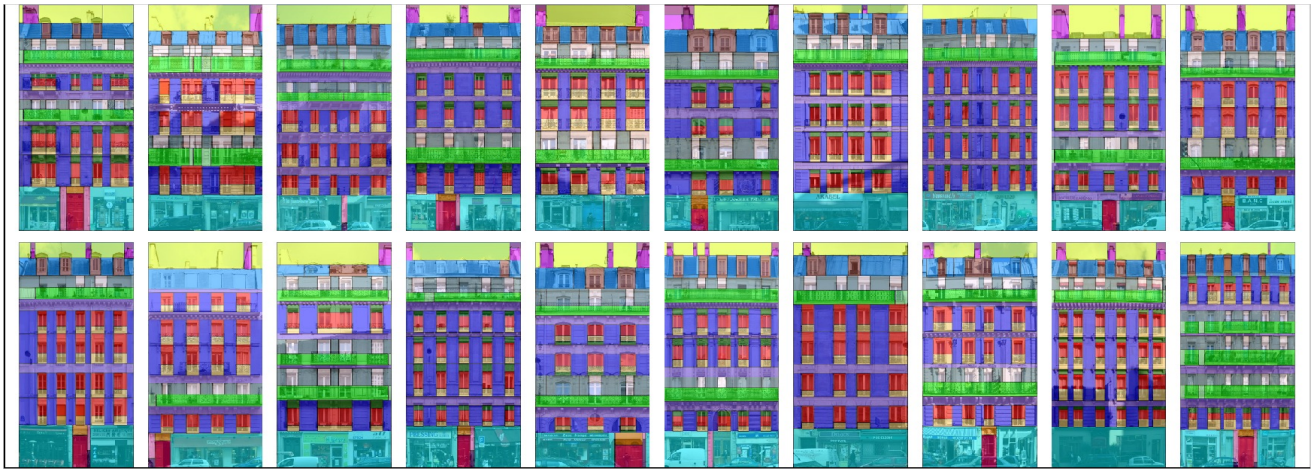
**Fold 4 - Segmentation - Hierarchy - Level 1**



**Fold 4 - Segmentation - Hierarchy - Level 2**

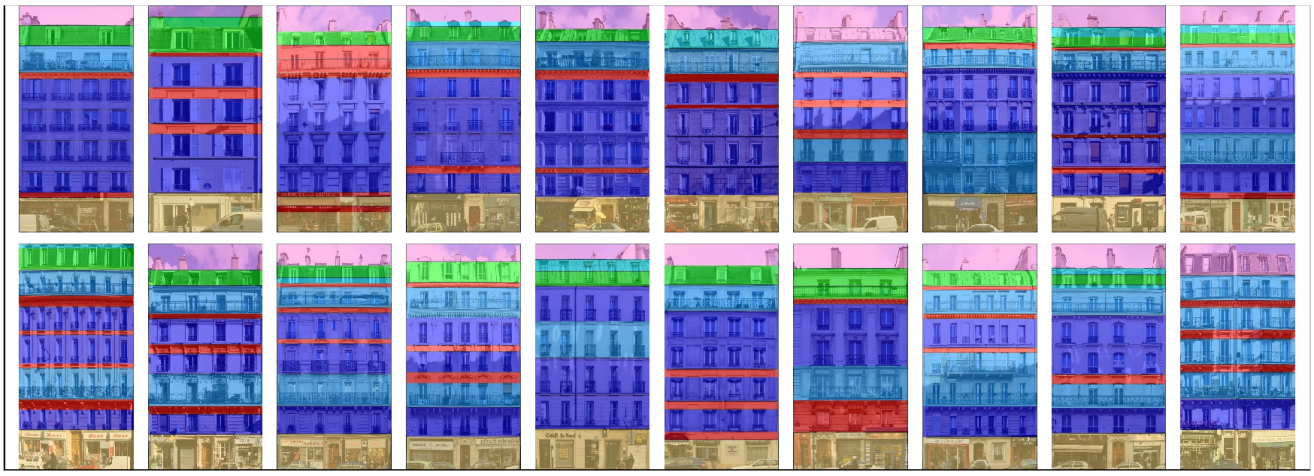


**Fold 4 - Segmentation - Hierarchy - Level 3**

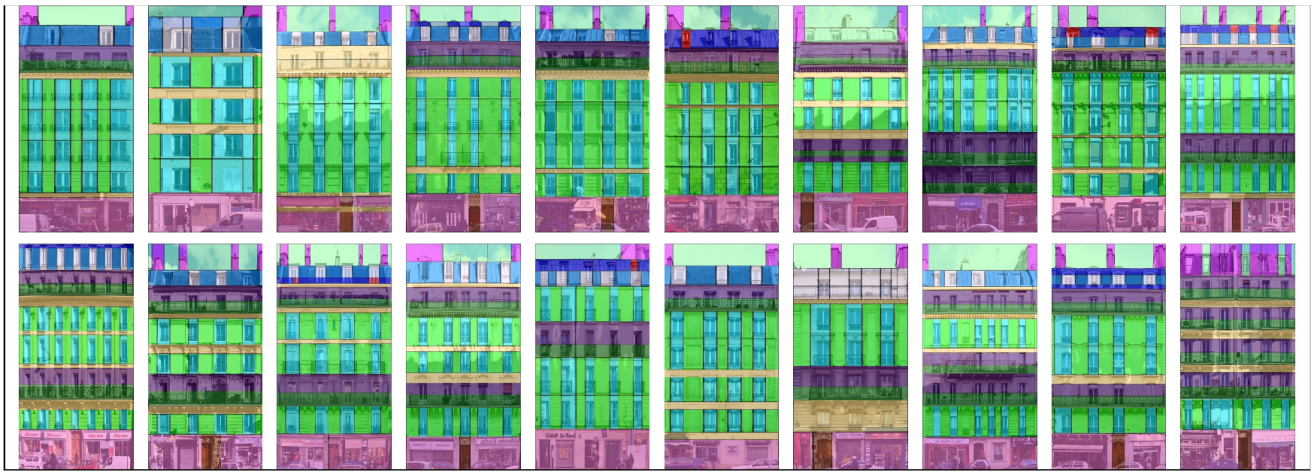


**Fold 5 - Input images and supervised classifier output**

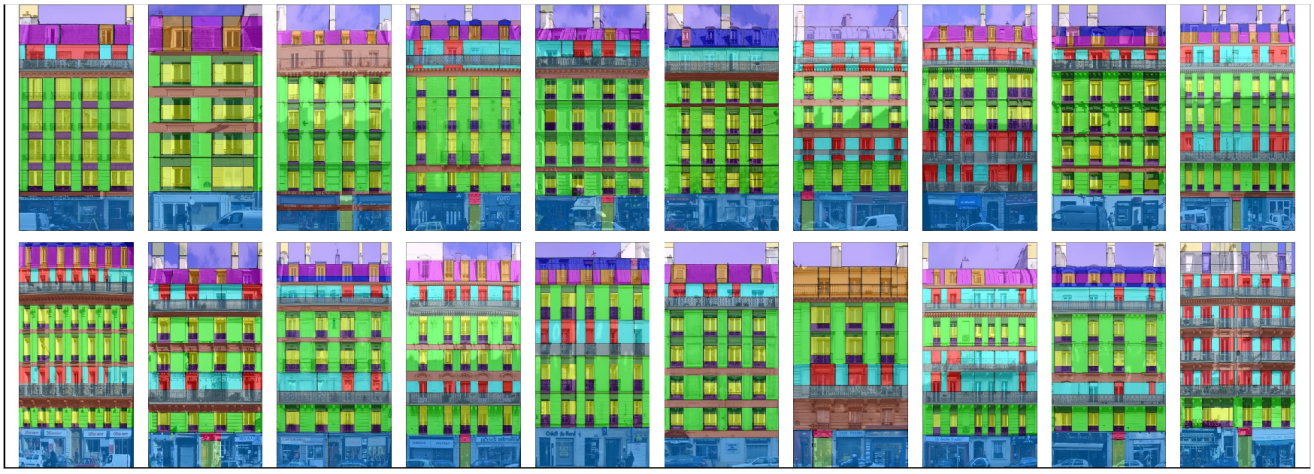
**Fold 5 - Segmentation - Hierarchy - Level 1**



**Fold 5 - Segmentation - Hierarchy - Level 2**



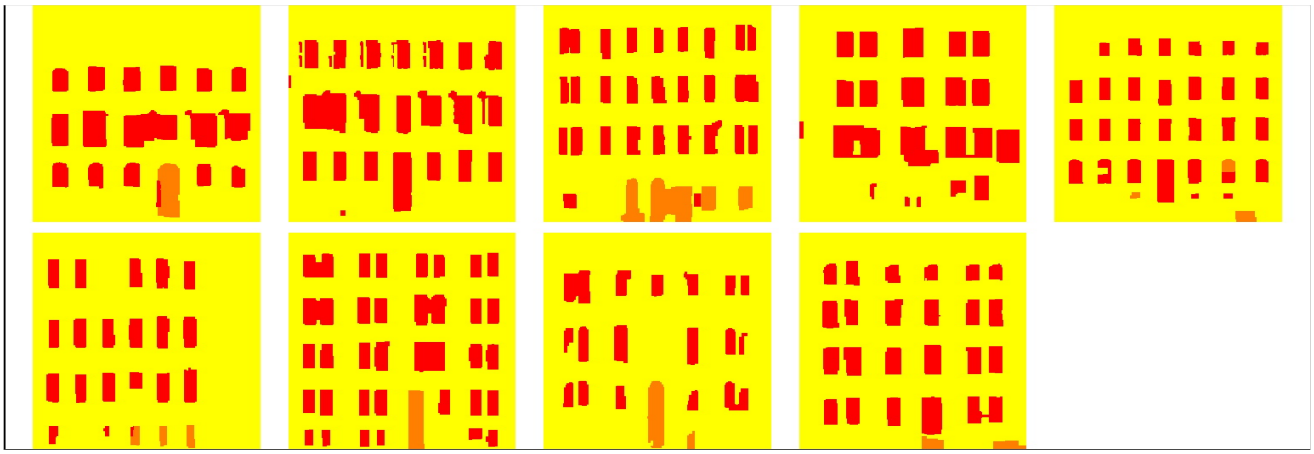
**Fold 5 - Segmentation - Hierarchy - Level 3**



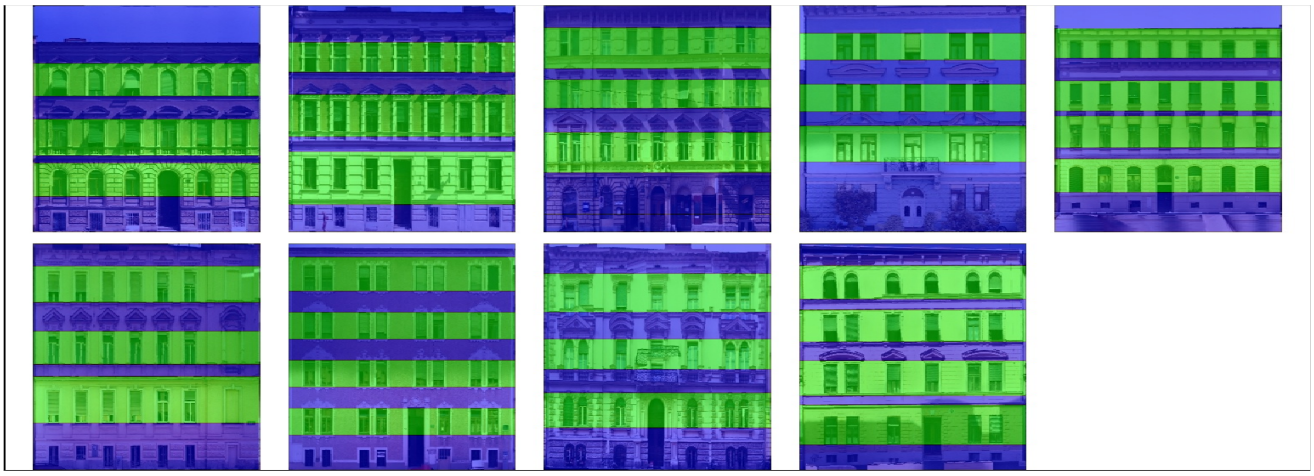
## 1.2. Gruenderzeit dataset

Since the Gruenderzeit dataset [2] contains only 30 images, we experimented on a single train-test split, with 23 images used to train the supervised classifier, and 7 test images for the hierarchical co-segmentation. The sparse labels and less support for the co-segmentation, make the inferred hierarchy less stable than the ones inferred from the ECP dataset.

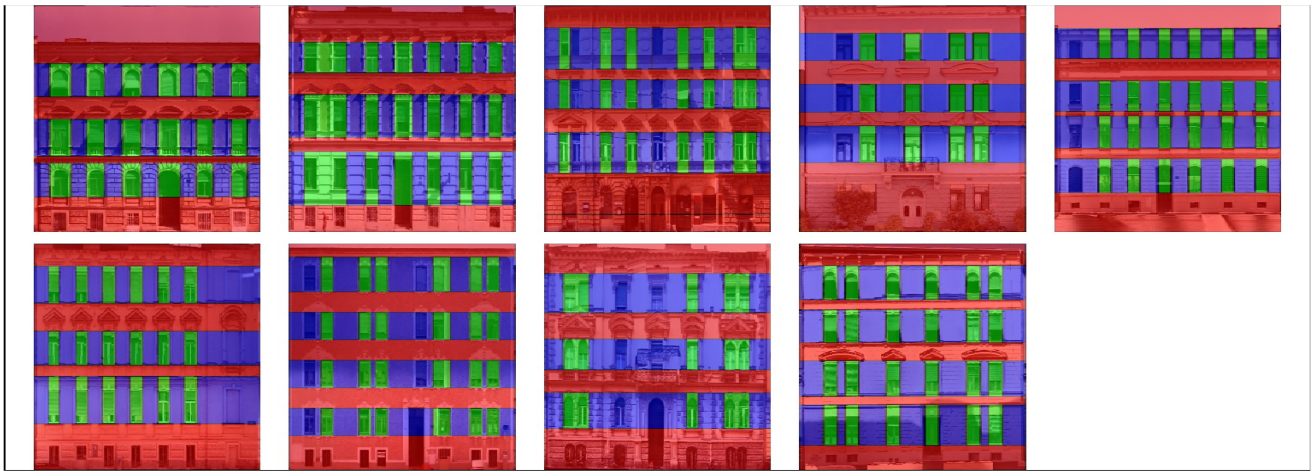
**Input images and supervised classifier output**



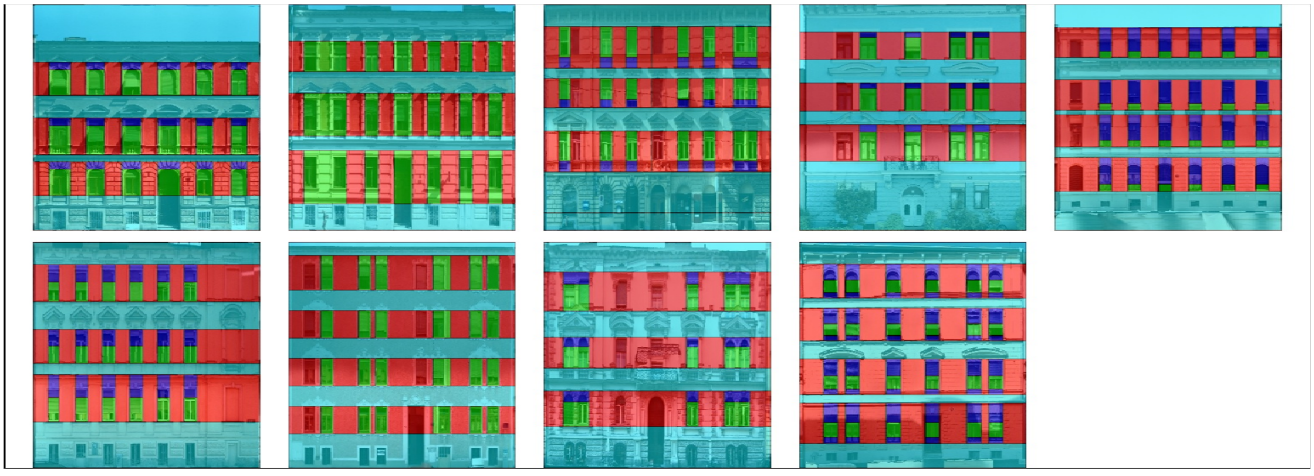
**Segmentation - Hierarchy - Level 1**



**Segmentation - Hierarchy - Level 2**



**Segmentation - Hierarchy - Level 3**



## References


[1] A. Martinović, M. Mathias, J. Weissenberg, and L. Van Gool. A three-layered approach to facade parsing. In *ECCV*, 2012. 1

[2] H. Riemenschneider, U. Krispel, W. Thaller, M. Donoser, S. Havemann, D. W. Fellner, and H. Bischof. Irregular lattices for complex shape grammar facade parsing. In *CVPR*, 2012. 1, 11

[3] O. Teboul, I. Kokkinos, L. Simon, P. Koutsourakis, and N. Paragios. Parsing facades with shape grammars and reinforcement learning. *IEEE TPAMI*, 35(7):1744–1756, 2013. 1