Exemplar-Based Face Parsing
Supplementary Material

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http://www.cs.wisc.edu/~lizhang/projects/face-parsing/

1. Additional Selected Results

Figures 1 and 2 supplement Figure 4 in our paper. In all cases, the input images come from our Helen [1] test set. We note that our algorithm generally produces accurate results, as shown in Figures 1. However, our algorithm is not perfect and makes mistakes on especially challenging input images, as shown in Figure 2.

In our view, the mouth is the most challenging region of the face to segment: the shape and appearance of the lips vary widely from subject to subject, mouths deform significantly, and the overall appearance of the mouth region changes depending on whether the inside of the mouth is visible or not. Unusual mouth expressions, like those shown in Figure 2, are not represented well in the exemplar images, which results in poor label transfer from the top exemplars to the test image. Despite these challenges, our algorithm generally performs well on the mouth, with large segmentation errors occurring infrequently.

2. Comparisons with Liu *et al.* [2]

The scene parsing approach by Liu *et al.* [2] shares sevaral similarities with our work. Like our approach, they propose a nonparametric system that transfers labels from exemplars in a database to annotate a test image. This begs the question, *Why not simply apply the approach from Liu et al. to face images?*

To help answer this question, we used the code provided by Liu *et al.* on our Helen [1] images; our exemplar set is used for training their system, and our test set is used for testing. Please see Section 4.3 in our paper for more details. Figure 3 shows several selected results for qualitative comparison. In general, our algorithm performs much better than Liu *et al.*'s algorithm.

References

[1] V. Le, J. Brandt, Z. Lin, L. Bourdev, and T. S. Huang. Interactive facial feature localization. In *ECCV*, 2012.

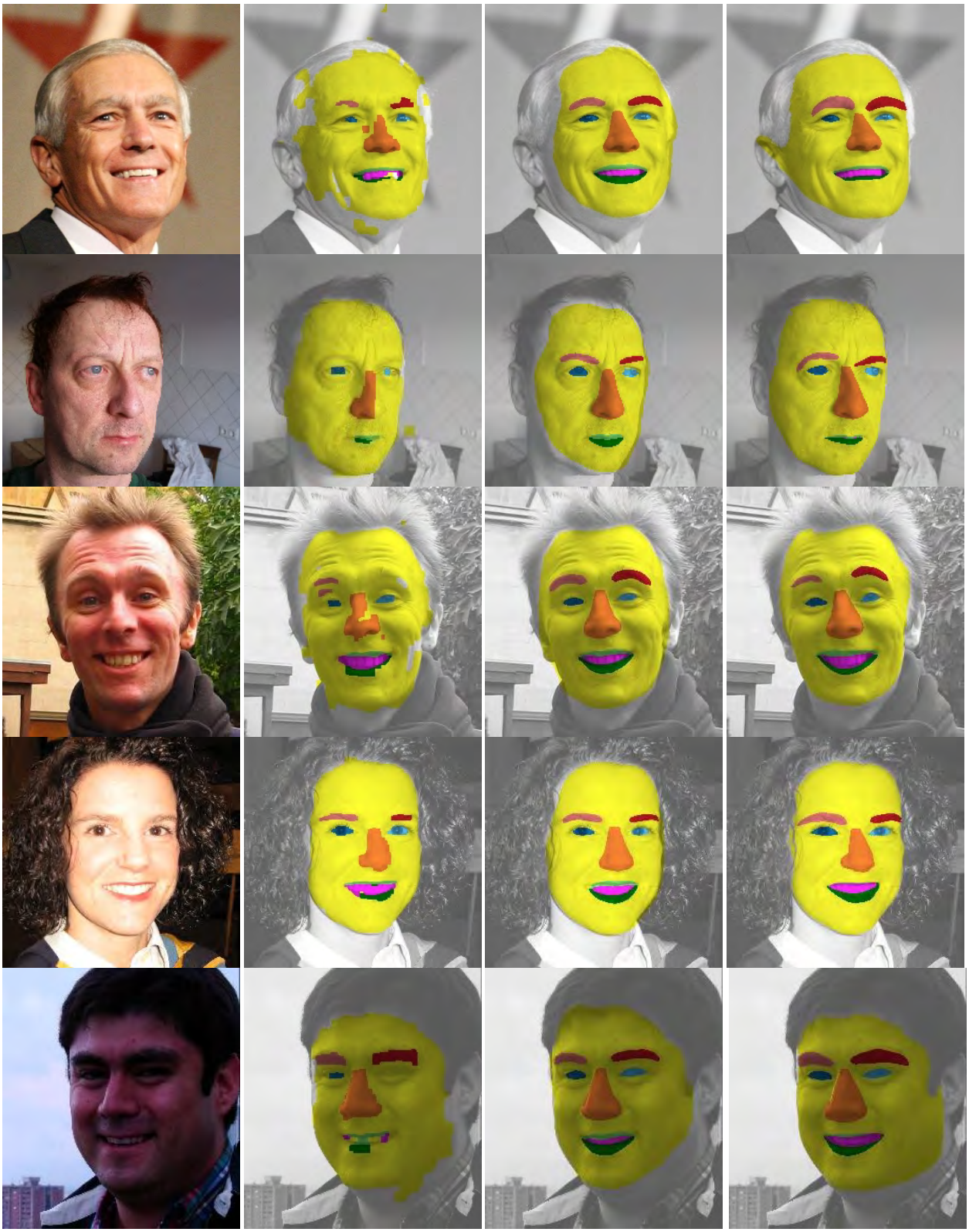
[2] C. Liu, J. Yuen, and A. Torralba. Nonparametric scene parsing via label transfer. In *PAMI*, December 2011.

Original image | Our method, *soft* segmentation | Our method, *hard* segmentation | Ground truth

Figure 1. **Selected qualitative results.** We note that our algorithm generally produces accurate results. **Best viewed in color.**

Original image | Our method, *soft* segmentation | Our method, *hard* segmentation | Ground truth

Figure 2. **Failure cases on mouths.** Large segmentation errors occur infrequently, but when they do occur, errors are almost always localized to the mouth region. Unusual mouth expressions like those shown above are not represented well in the exemplar images, which results in poor label transfer from the top exemplars to the test image. **Best viewed in color.**



Original image | Liu *et al*. [2] | Our method | Ground truth

Figure 3. **Qualitative comparison with Liu *et al*. [2].** We see that the segments generated by Liu *et al*. are visibly less accurate, especially in the mouth region. This suggests that a general scene parsing approach is not well suited for faces. **Best viewed in color.**