

Crisp Boundary Detection Using Pointwise Mutual Information – Supplementary Material

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1 Consensus labels

Recently, Hou et al. [1] pointed out that many of the “ground truth” contours in BSDS are perceptually quite weak, and may not be indicative of real object boundaries. To account for this issue, Hou et al. suggested benchmarking algorithms against a subset of “consensus labels” in the BSDS dataset. Hou et al. define consensus labels as follows. Each BSDS image was labeled by several humans. Consensus labels are those pixels that *all* labelers for a given image mark as a contour. To see how well we match boundaries that all labelers agree on, we benchmark our algorithm against consensus labels. Results are listed in Table 1. On the ODS and OIS measures, our algorithm significantly outperforms SE and gPb-owt-ucm, while on AP, SE achieves the best results.

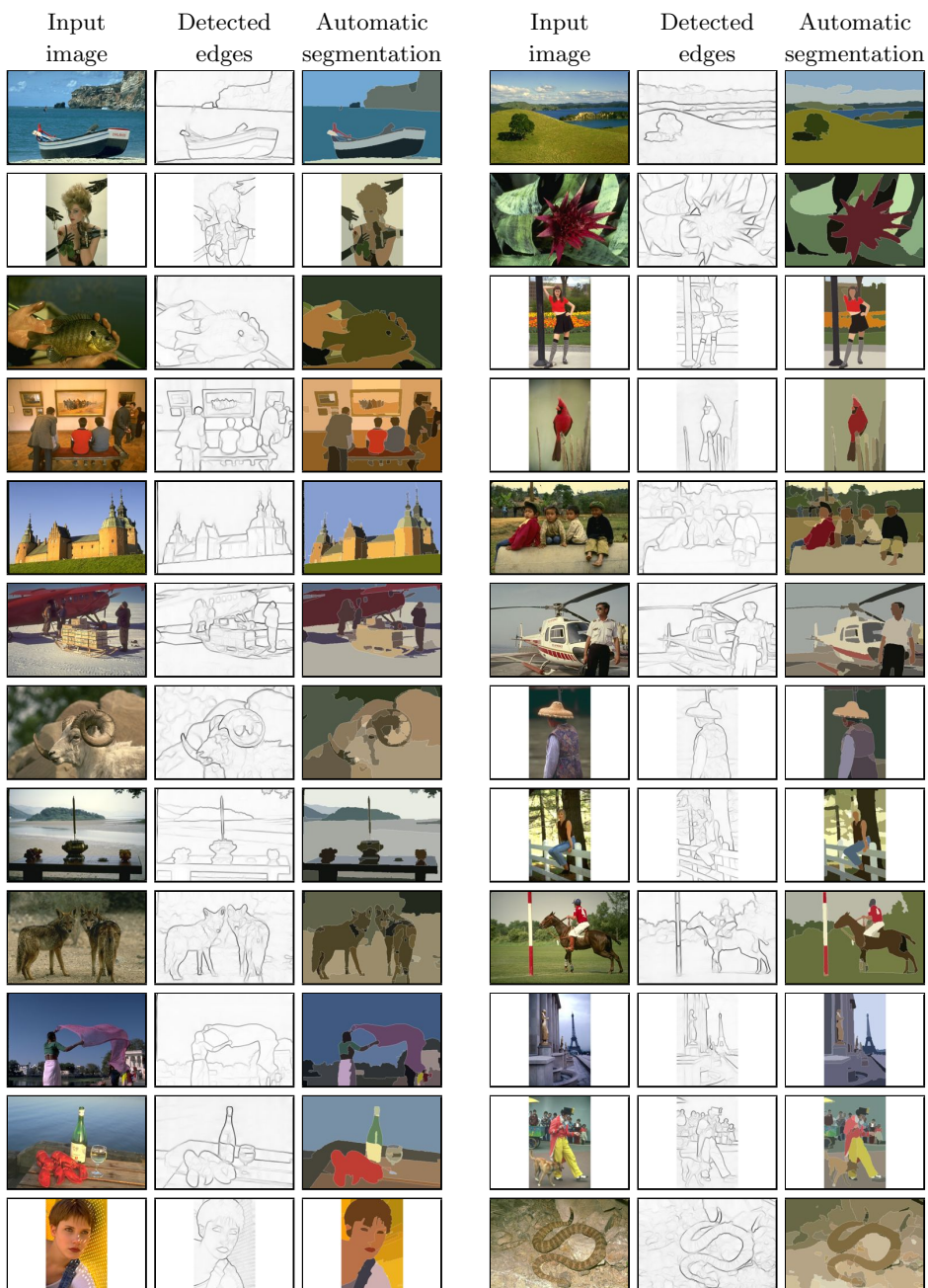
Algorithm	ODS	OIS	AP
gPb-owt-ucm [2]	0.59	0.65	0.44
SE [3]	0.59	0.62	0.58
Our method – MS	0.61	0.68	0.56

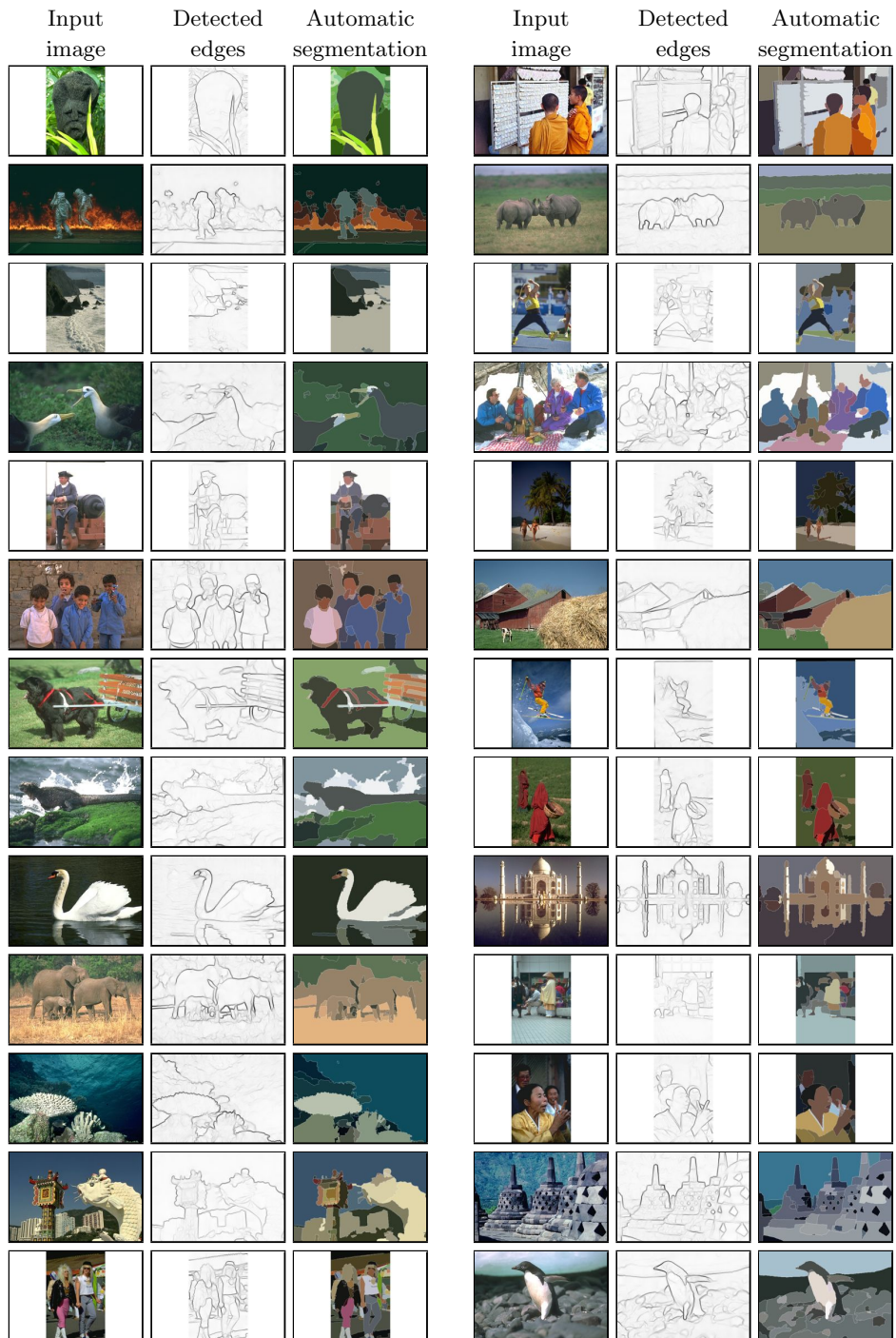
Table 1. Evaluation on BSDS500 consensus edges [1]. We achieve a substantial improvement over the state-of-the-art in the ODS and OIS measures.

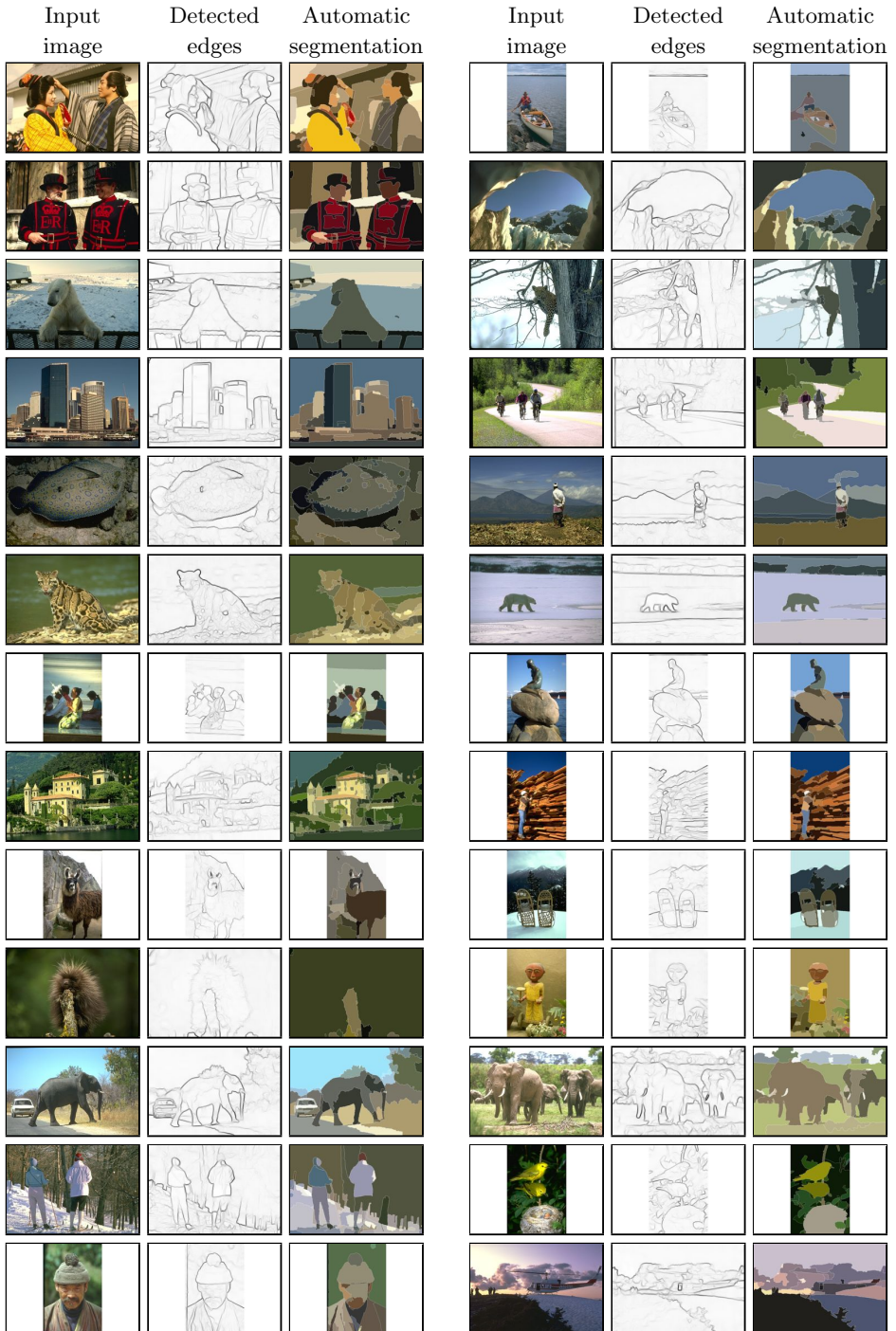
2 Full results on BSDS500

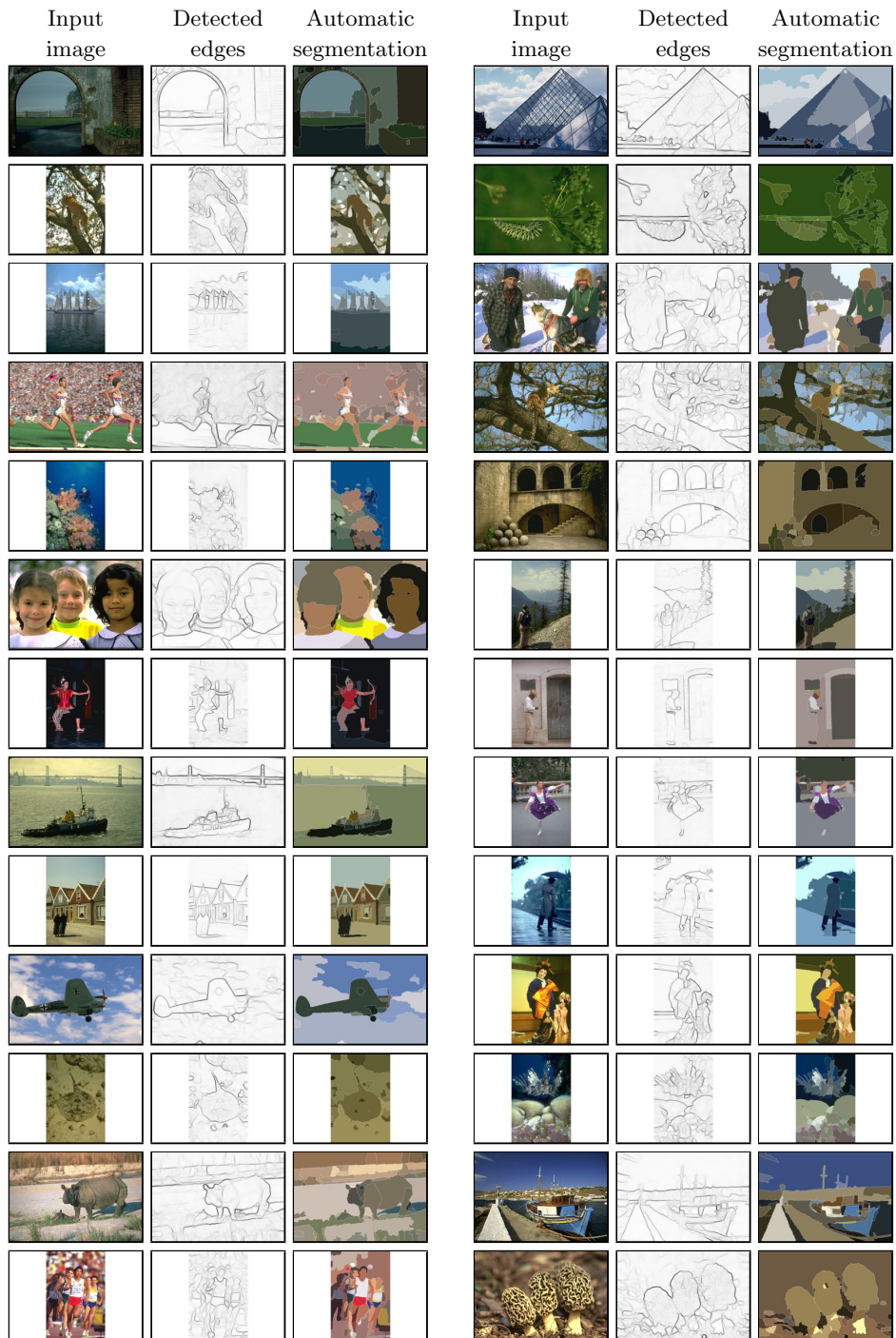
Table 2 shows our full results on the BSDS500 test set.

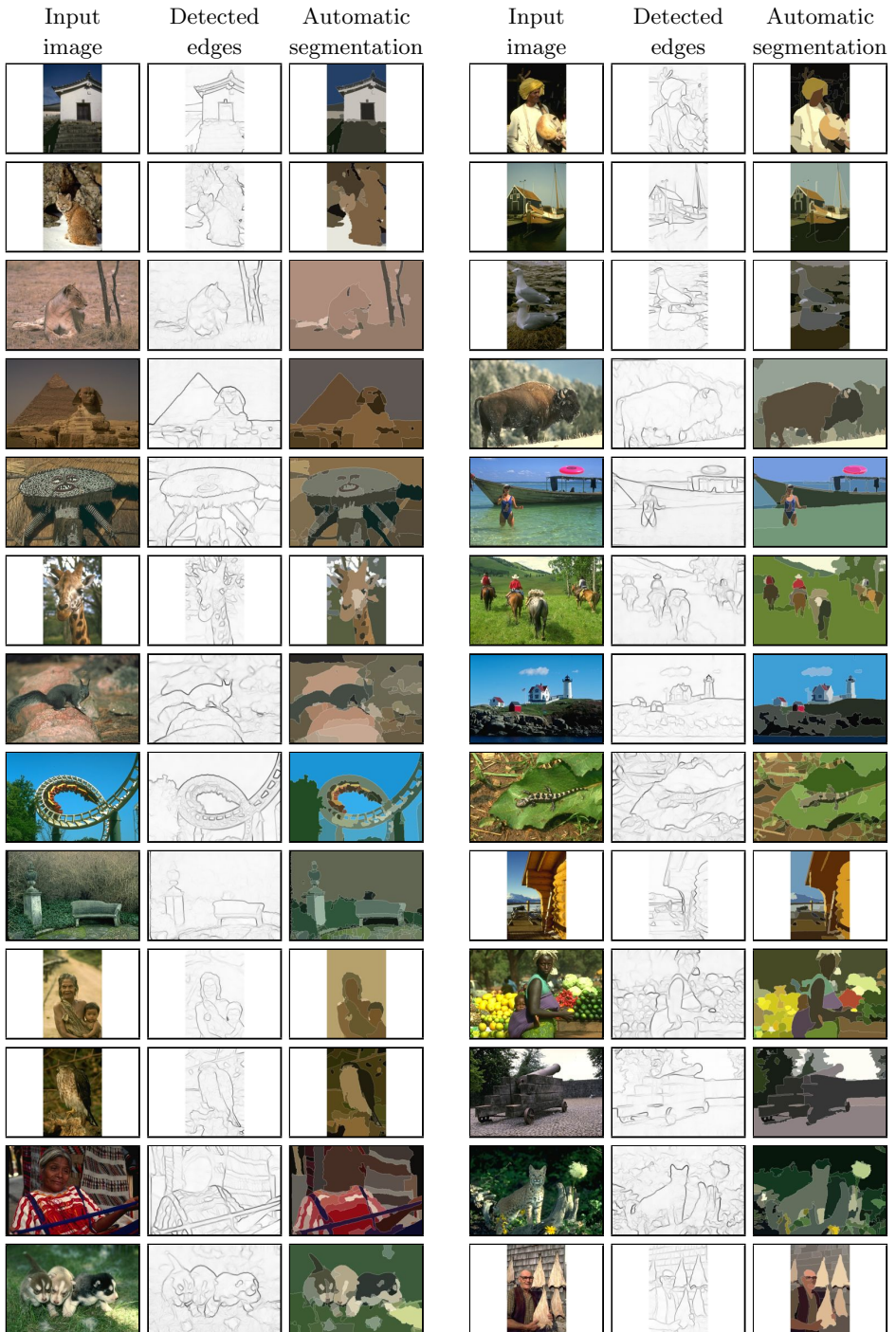
Table 2: Results on the full BSDS500 test set. Detected edges and automatic segmentation using our method are displayed to the right of each test image. Images are sorted from top to bottom by high to low OIS score (i.e. images on last page are “failure cases”).

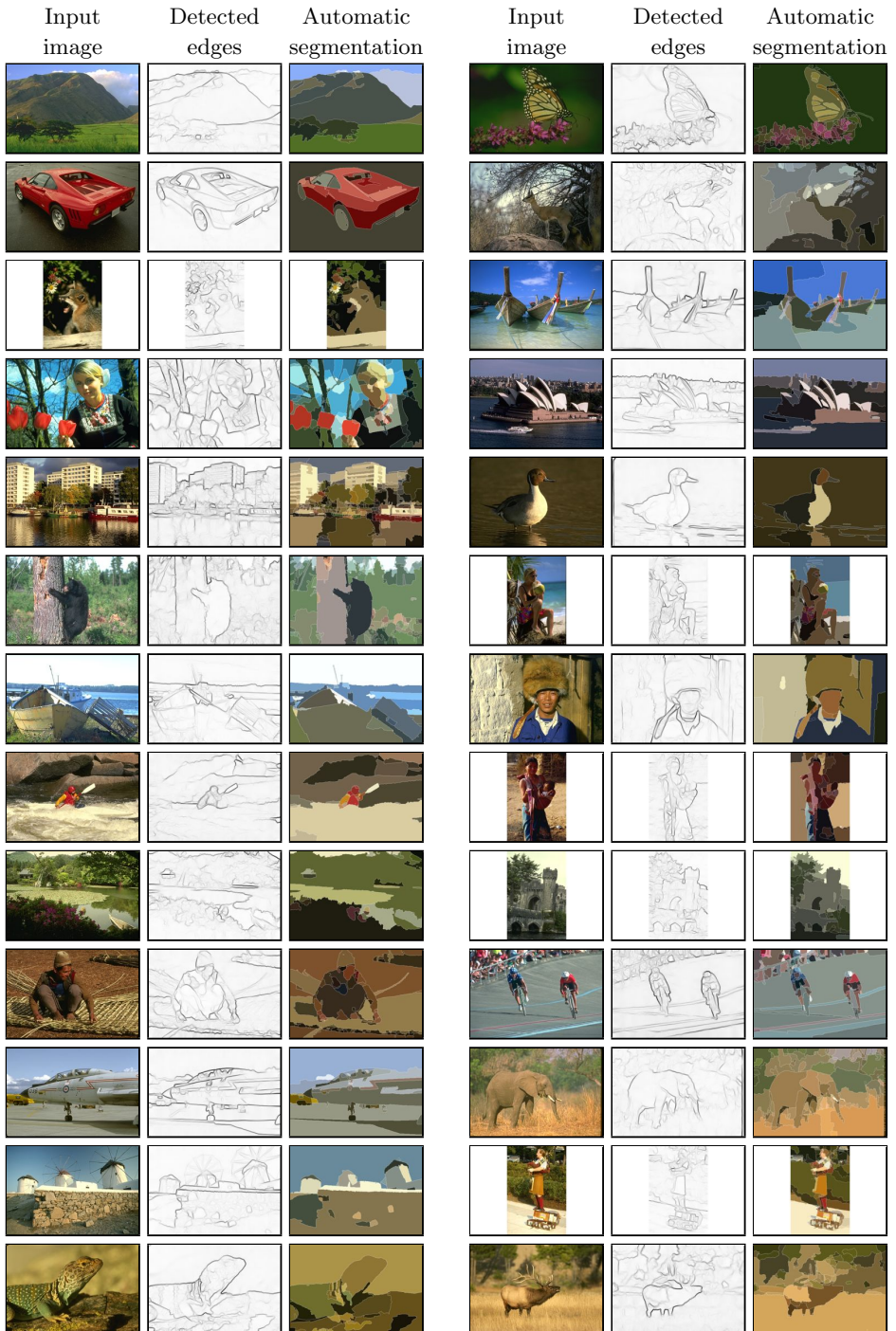


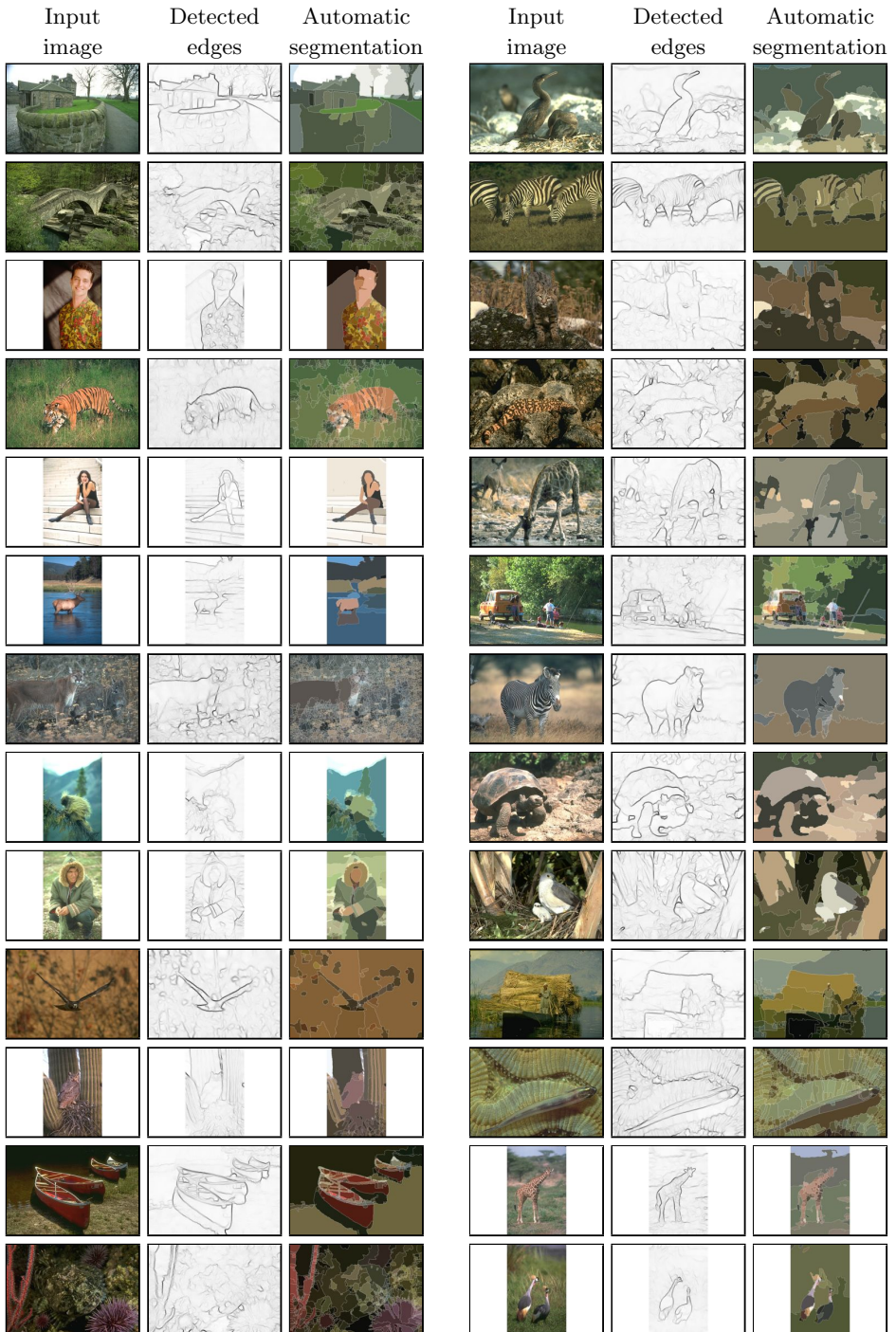














References

1. Hou, X., Yuille, A., Koch, C.: Boundary Detection Benchmarking: Beyond F-Measures. CVPR (2013)
2. Arbeláez, P., Maire, M., Fowlkes, C., Malik, J.: Contour detection and hierarchical image segmentation. IEEE Trans. Pattern Anal. Mach. Intell. **33**(5) (May 2011) 898–916
3. Dollár, P., Zitnick, C.: Structured Forests for Fast Edge Detection. ICCV (2013)