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Supplementary Document on Live User-Guided Depth Map Estimation for Single Images

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1 Introduction

In this supplementary document, we show additional comparison results between the depth maps and the depth-based effects generated by our work and the works of Yuan *et al.* [3] and Liao *et al.* [2].

As can be seen from Figures 1 and 3, the work of Yuan *et al.* is generally the most accurate user-guided depth map estimation algorithm, followed by our work and the work of Liao *et al.*. Even so, it is noteworthy that the RMSE difference between our work and the work of Yuan *et al.* is too small for all the tested images of the Sintel dataset [1] (Figure 3), and our work even surpasses the work of Yuan *et al.* in the image on the left of Figure 1.

When comparing all the techniques with respect to their depth-based effects (Figures 2 and 4), we can see that all of them are able to generate visually plausible effects, and in a few cases, illustrated mainly in the images on left of Figures 2 and 4, the perceptual errors are too high that could probably be easily perceived by a human.

In Figures 5, 6 and 7, we compare the results generated by distinct user-guided depth map estimation algorithms for free images available on the web, that do not have a ground-truth depth map, but were depth annotated in order to simulate distinct depth-based effects over the original images. It is visible that all the techniques are able to provide the desired depth-based effects. In this sense, we reinforce that our technique is the only one that can simulate those effects in real time, allowing the user to annotate the image and see interactively the result of his/her depth annotation. We refer the reader to the supplementary video to see the real-time performance provided by our method during the user-guided depth map annotations.

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References

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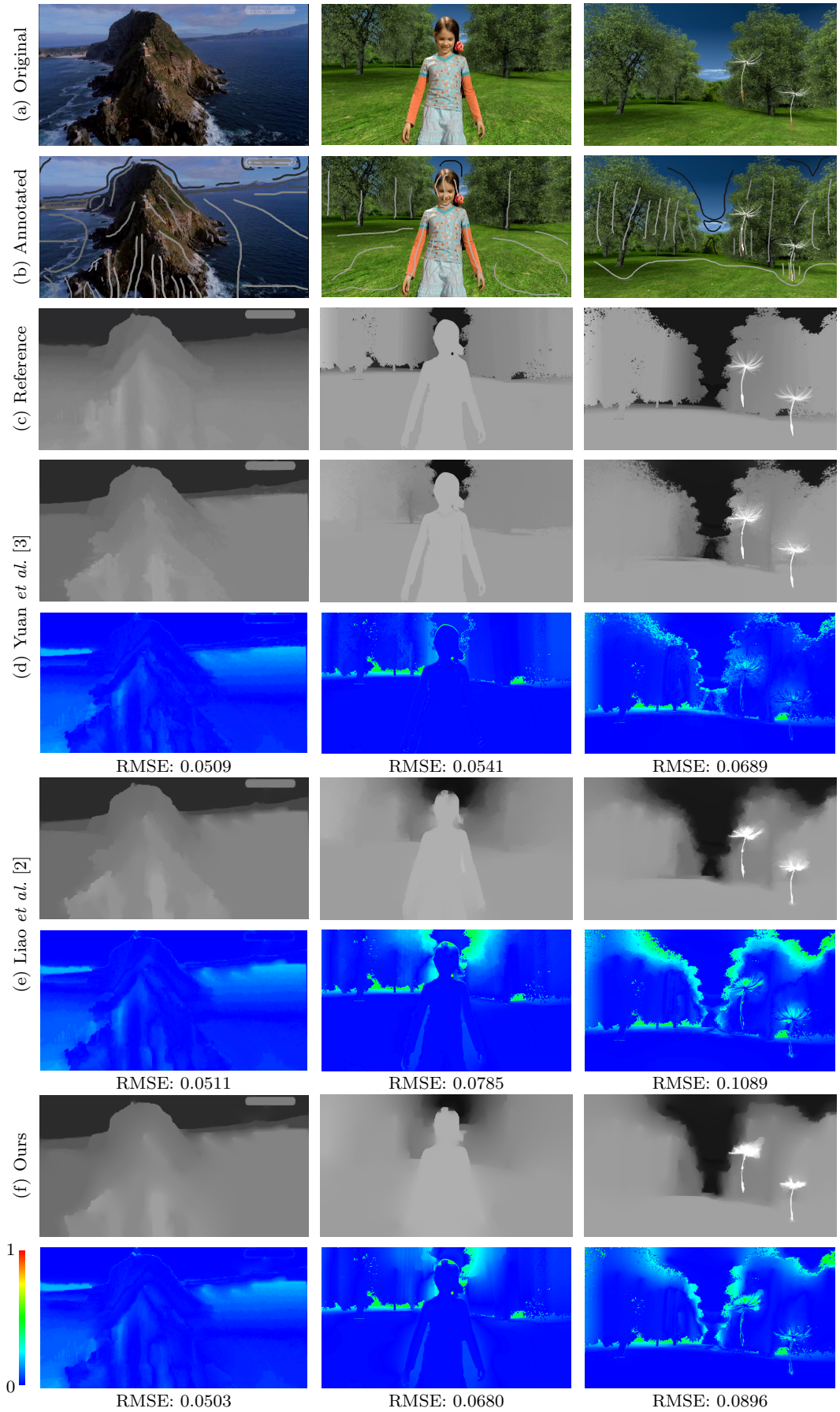

Fig. 1 A comparison between the depth maps generated by related work (d, e) and our approach (f) for the sparsely depth annotated (b) Inition-2d3d-Showreel (left), Philips (middle) and Philips-2 (right) images of the dataset annotated by Yuan *et al.* [3] (a). False color maps show intensity differences to the reference depth maps (c).

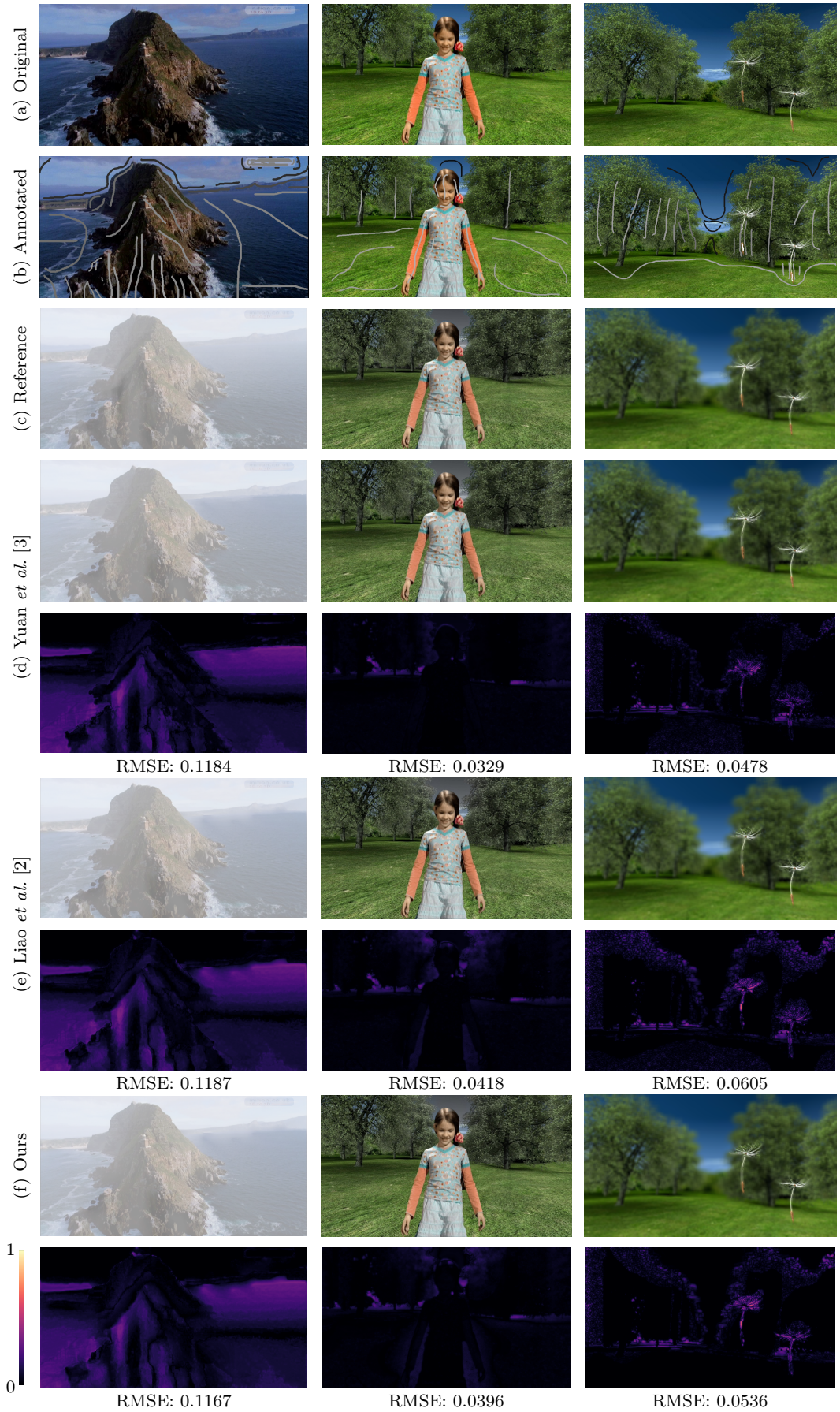

Fig. 2 A comparison between haze (left), desaturation (middle) and refocus (right) depth-based effects generated by related work (d, e) and our approach (f) for the sparsely depth annotated (b) Inition-2d3d-Showreel (left), Philips (middle) and Philips-2 (right) images of the dataset annotated by Yuan *et al.* [3] (a). False color maps show perceptual differences to the reference images (c).

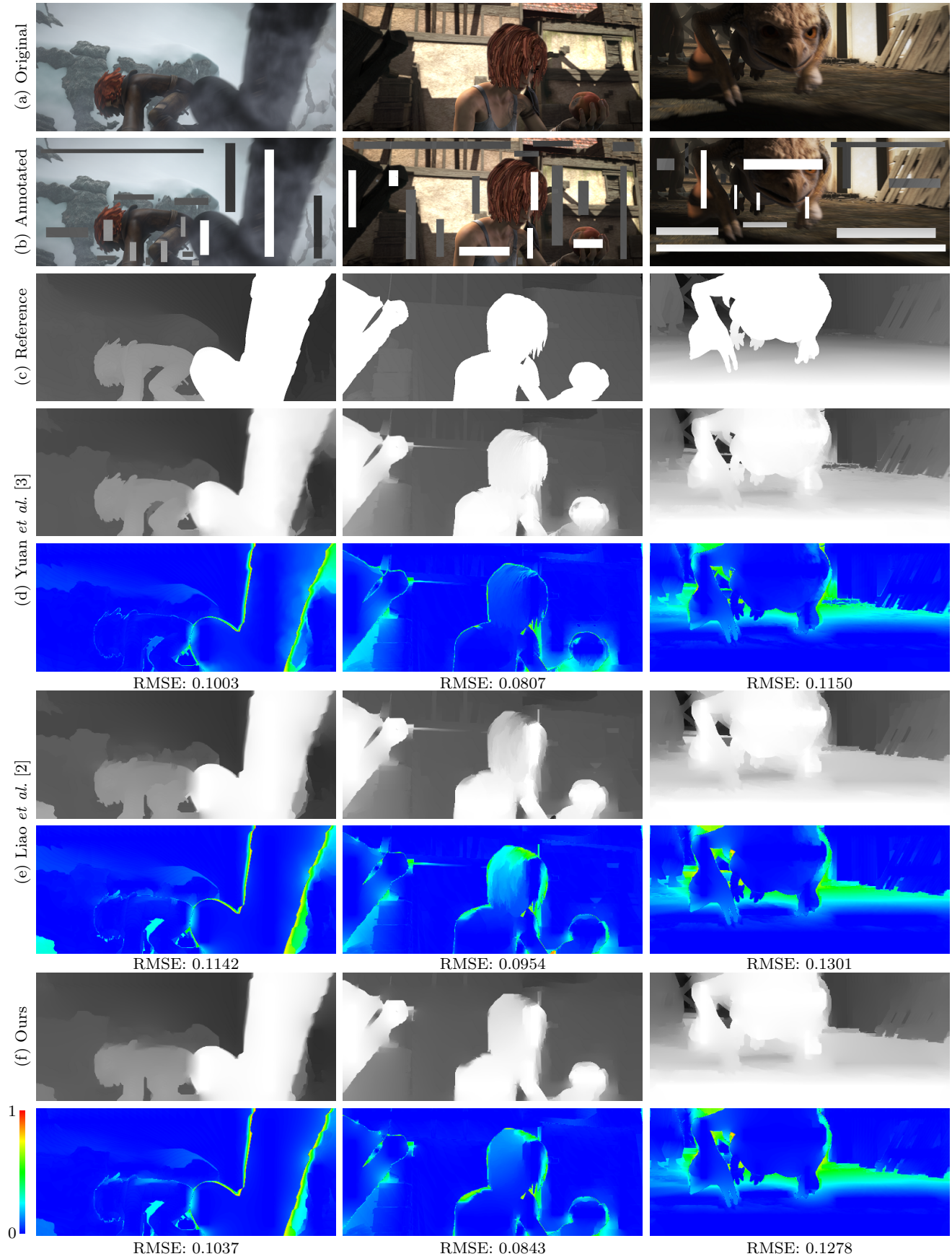

Fig. 3 A comparison between the depth maps generated by related work (d, e) and our approach (f) for the Sintel dataset [1] (a) that we sparsely depth annotated (b). False color maps show intensity differences to the reference depth maps (c).

Fig. 4 A comparison between haze (left), desaturation (middle) and refocus (right) depth-based effects generated by related work (d, e) and our approach (f) for the Sintel dataset [1] (a) that we sparsely depth annotated (b). False color maps show perceptual differences to the reference images (c).

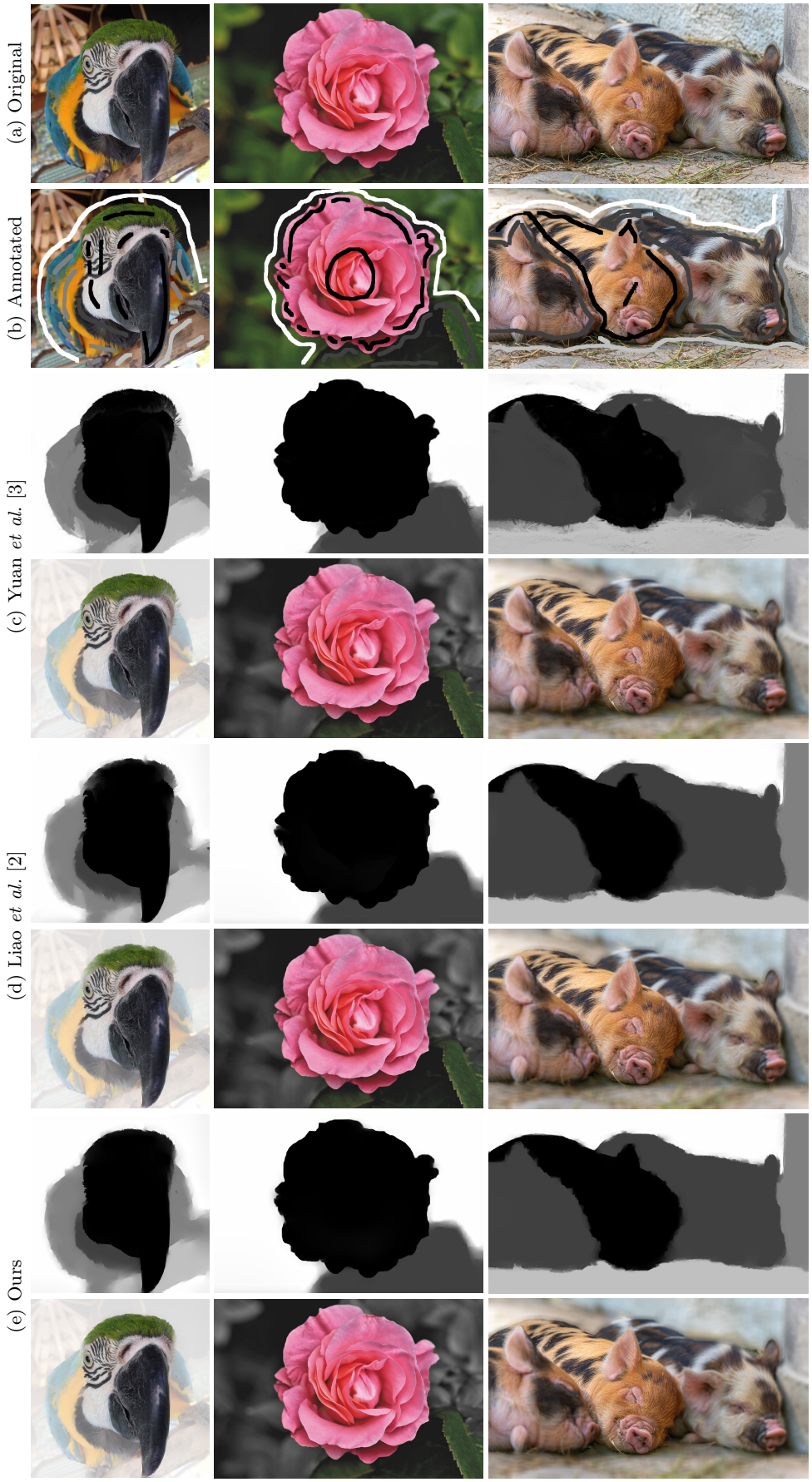

Fig. 5 A qualitative comparison between the depth maps and depth-based effects generated by related work (c, d) and our approach (e) for sparsely depth annotated images (a). Macaw image (left) is courtesy of Pxfuel. Flower image (middle) by Capri23auto from Pixabay. Pigs image (right) by Heidelbergerin from Pixabay.

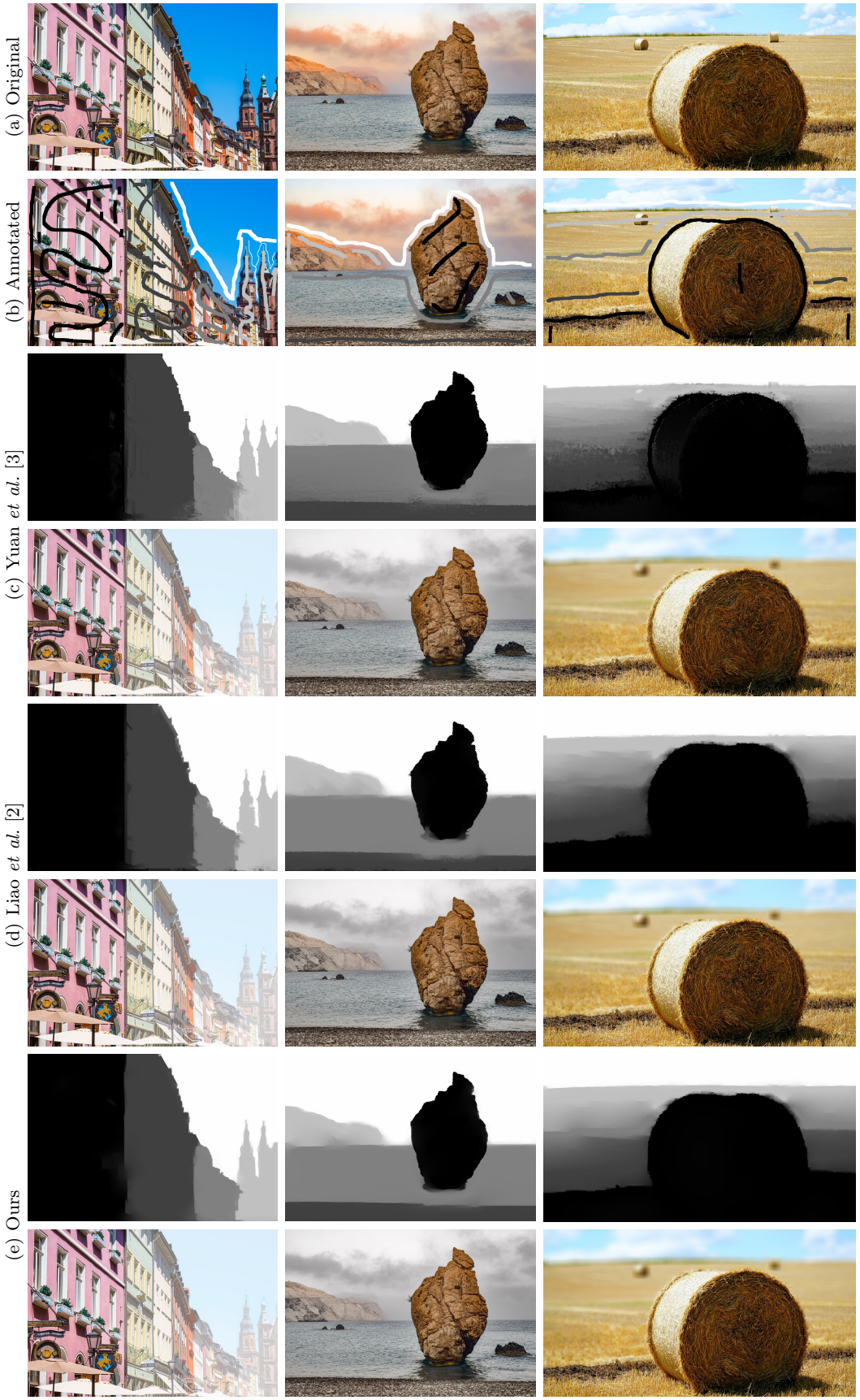

Fig. 6 A qualitative comparison between the depth maps and depth-based effects generated by related work (c, d) and our approach (e) for sparsely depth annotated images (a). Heidelberg image (left) by Heidelbergerin from Pixabay. Rock image (middle) by Dimitris Vetsikas from Pixabay. Straw image (right) by Matthias Böckel from Pixabay.

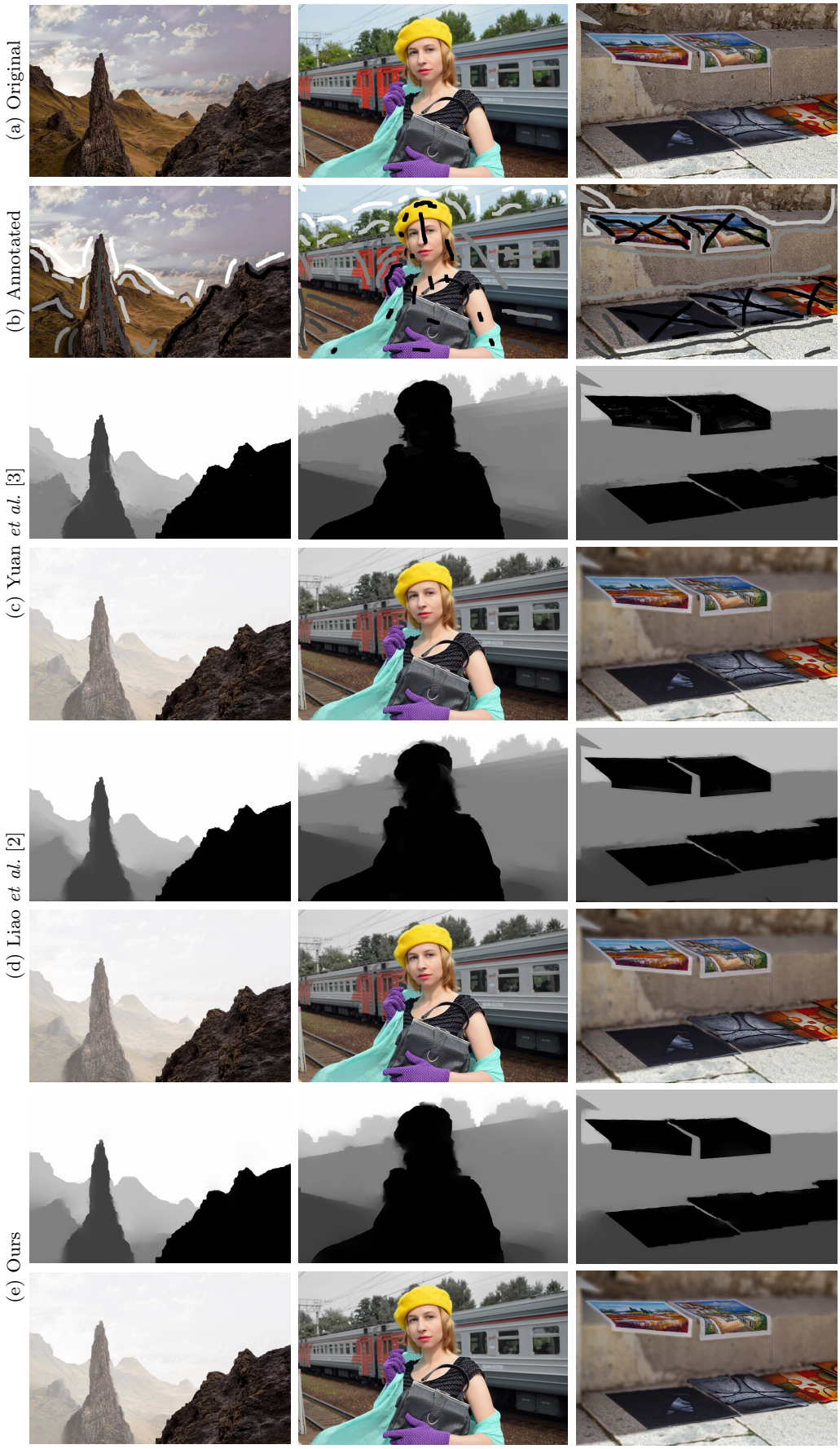

Fig. 7 A qualitative comparison between the depth maps and depth-based effects generated by related work (c, d) and our approach (e) for sparsely depth annotated images (a). Hills image (left) by Pete Linforth from Pixabay. Vintage girl image (middle) by Victoria Borodinova from Pixabay. Street art image (right) by Simy27 from Pixabay.