A. Supplementary appendix

A.1. Weighted Eight-Point Algorithm

Here we provide a detailed description of the weighted eight-point algorithm [3]. Given N correspondences $c_i = (x_1^i, y_1^i, x_2^i, y_2^i), 1 \leq i \leq N$, we can construct a matrix $\mathbf{X} \in \mathcal{R}^{N\times 9}$, where each row has the form of $[x_1^i x_2^i, x_1^i y_2^i, x_1^i, y_1^i x_2^i, y_1^i y_2^i, y_1^i, x_2^i, y_2^i, 1]$.

Traditional eight-point algorithm [1] seeks to minimize $\|\mathbf{X}^T\mathbf{X}\text{Vec}(\mathbf{E})\|$ to recover the essential matrix $\mathbf{E}$, where $\text{Vec}(\cdot)$ is the vectorization operation. The weighted eight-point algorithm extends traditional eight-point algorithm to a weighted formulation, which minimizes $\|\mathbf{X}^T\text{diag}(\mathbf{w})\mathbf{X}\text{Vec}(\mathbf{E})\|$, where $\mathbf{w}$ is the probabilities predicted by the neural network. This linear least square problem has a closed-form solution that $\text{Vec}(\mathbf{E})$ is the eigenvector associated to the smallest eigenvalue of $\|\mathbf{X}^T\text{diag}(\mathbf{w})\mathbf{X}\|$. The eigendecomposition operation is also differentiable according to [2] which makes the essential matrix regression term can be trained end-to-end.

A.2. Outlier rejection results of different methods

For completeness, we also provide the precision (inlier ratio), recall and F-score of each method in Tab. 1.

	Outdoor			Indoor		
	precision (%)	recall (%)	F-score	precision (%)	recall (%)	F-score
RANSAC	41.83	57.08	48.28	44.11	46.42	45.24
PointCN[3]	51.18	84.81	63.84	45.45	82.95	58.72
Ours	**54.55**	**86.67**	**66.96**	**46.95**	**83.78**	**60.18**

Table 1. Result comparison of different methods. Inlier threshold is 10^{-4} of symmetric epipolar distance.

References

[1] Richard Hartley and Andrew Zisserman. *Multiple view geometry in computer vision*. Cambridge university press, 2003. 1

[2] Catalin Ionescu, Orestis Vantzos, and Cristian Sminchisescu. Matrix backpropagation for deep networks with structured layers. In *International Conference on Computer Vision (ICCV)*, 2015. 1

[3] Kwang Moo Yi, Eduard Trulls, Yuki Ono, Vincent Lepetit, Mathieu Salzmann, and Pascal Fua. Learning to find good correspondences. In *Computer Vision and Pattern Recognition (CVPR)*, 2018. 1