Supplemental Material for Fast and Efficient Zero-Learning Image Fusion

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We present supplemental material relating to the **Fast and Efficient Zero-Learning Image Fusion** work. We first show more detailed results and images from our ablation studies. Then we display additional pairs of images for thermal, medical, and multi-focus fusion. We also show additional multi-exposure sequence fusions. Finally, we cite the links for the datasets and codes for fusion methods and fusion metrics. The section titles below contain references to their corresponding sections in the paper, mentioned in parentheses.

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I. Two-scale decomposition (Sec. IV-C1)

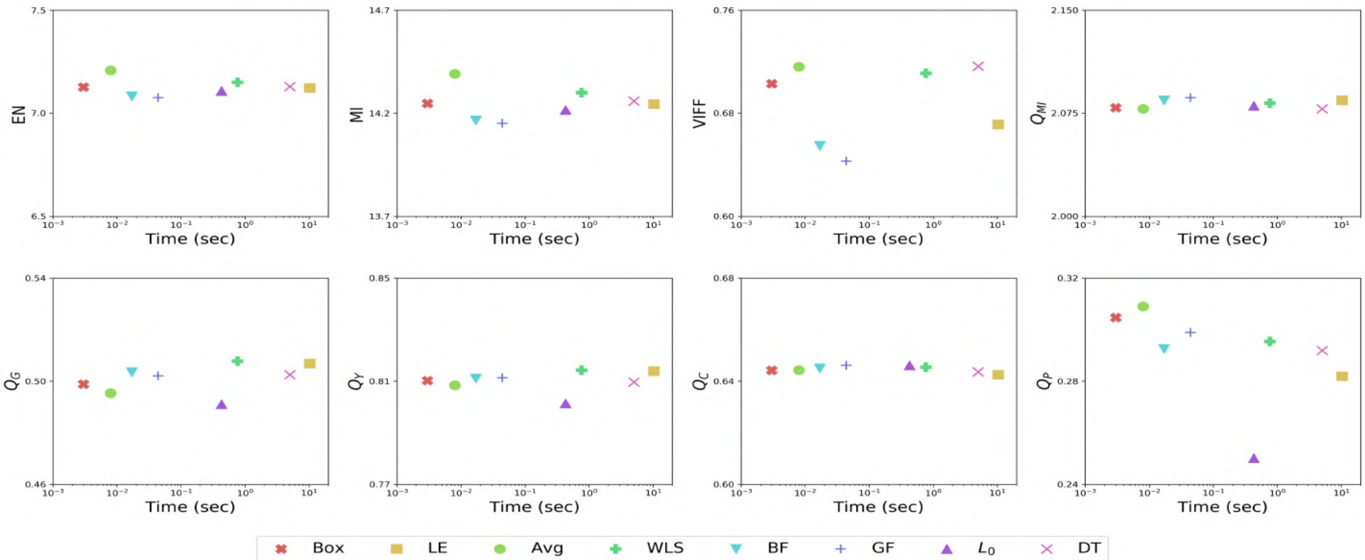

Fig. 1. Fusion quality with respect to two-scale decomposition runtime.

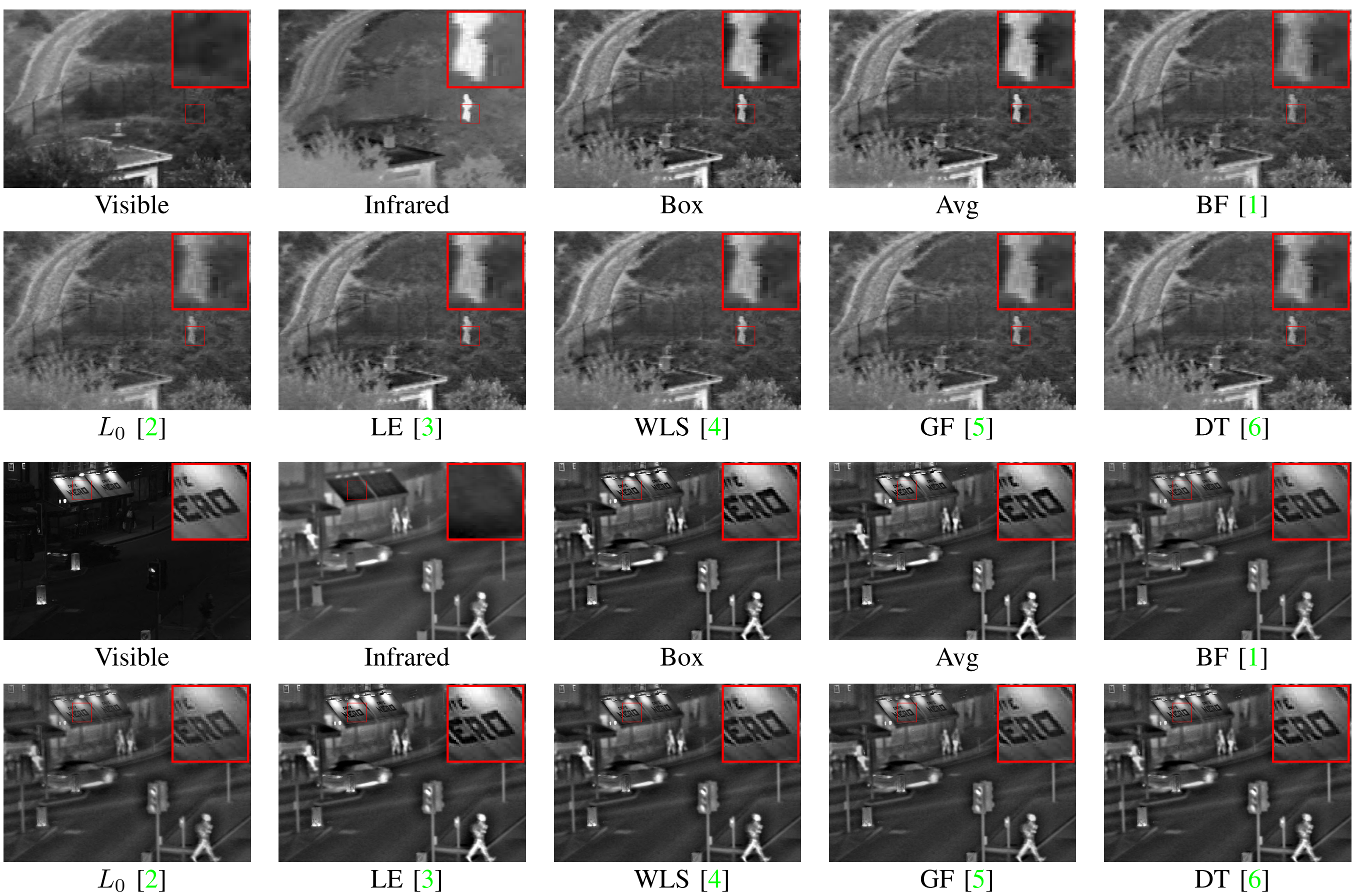

Fig. 2. Visible and infrared images with results obtained by the evaluated decomposition filters. Insets are magnified ×4. Best viewed on screen.

II. Weight construction methods (Sec. IV-C2)

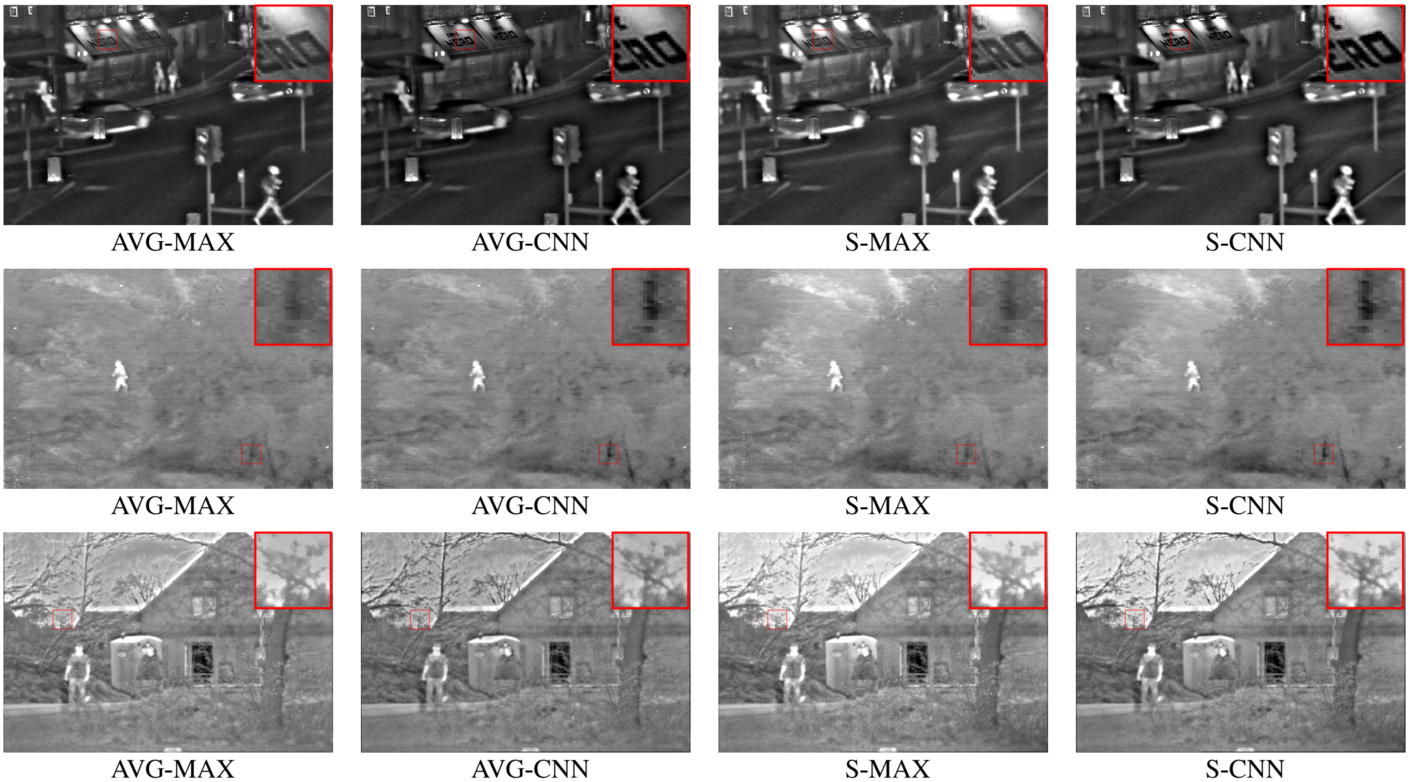

Fig. 3. Visible and infrared images with results obtained by the evaluated weight construction methods. Insets are magnified ×4. Best viewed on screen.

III. Architecture and depth impact (Sec. IV-C4)

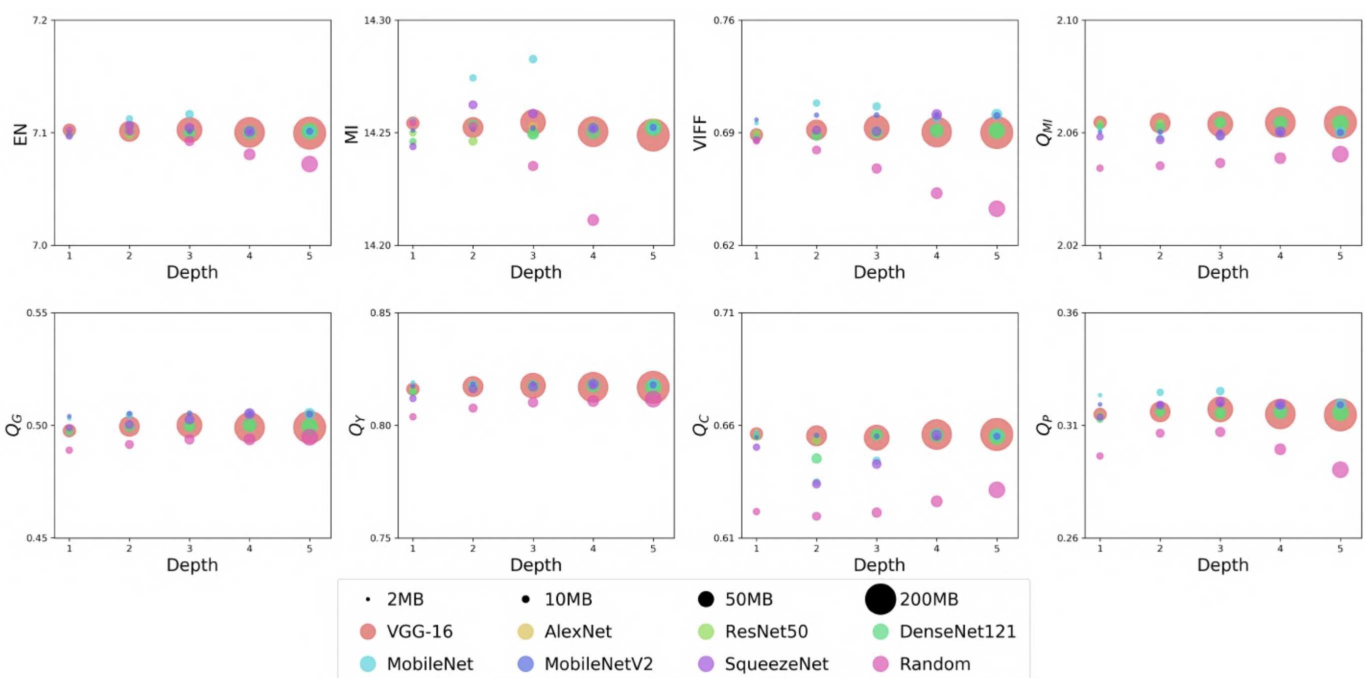

Fig. 4. Fusion performance with respect to network architecture and depth.

IV. Thermal fusion (Sec. IV-D1)

Fig. 5. Visible and infrared images with fusion results obtained by different fusion methods. Insets are magnified ×4. Best viewed on screen.

V. MEDICAL FUSION (SEC. IV-D2)

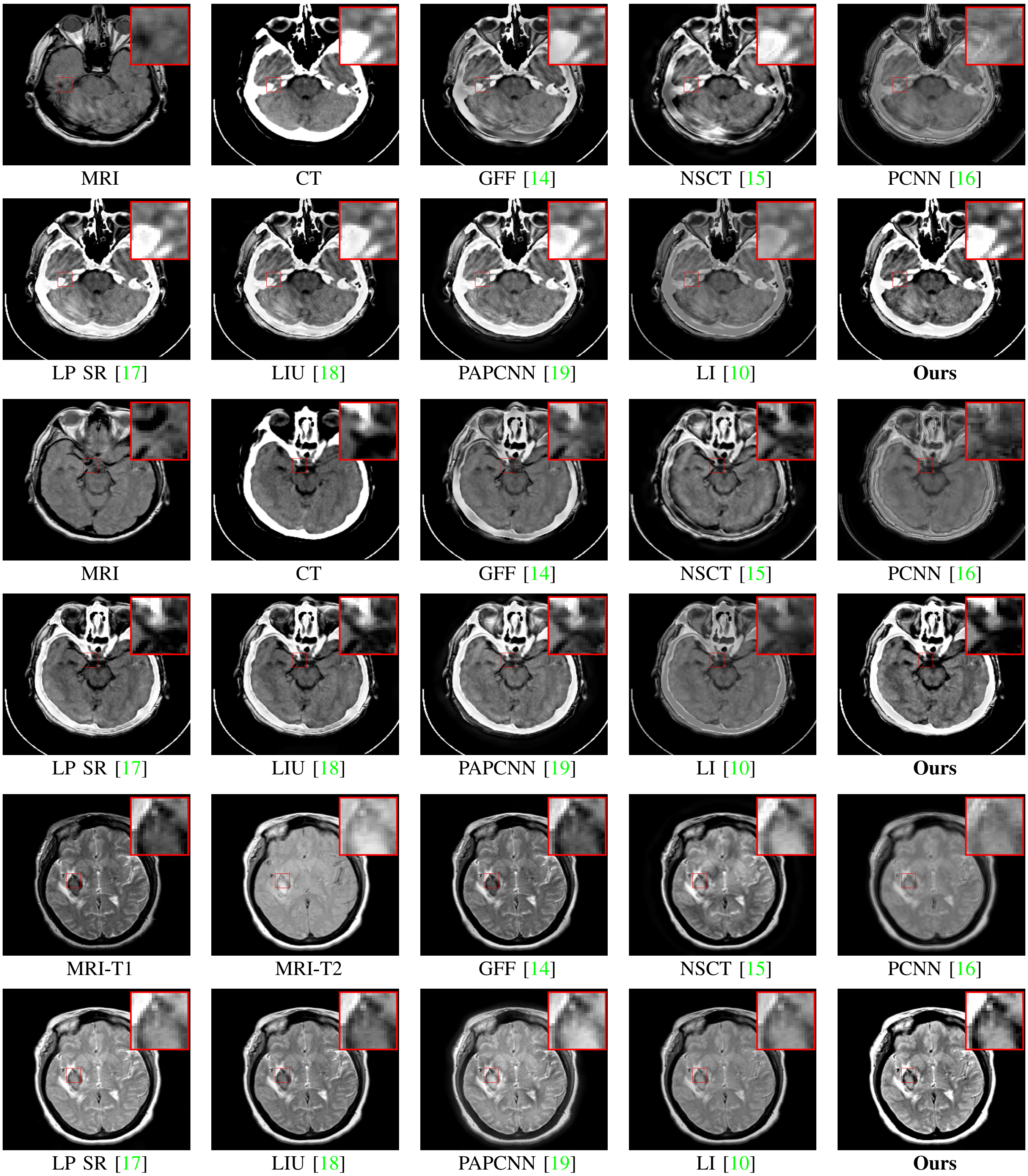

Fig. 6. MRI and CT images with fusion results obtained by different fusion methods. Insets are magnified $\times 4$. Best viewed on screen.

VI. MULTI-FOCUS FUSION (SEC. IV-D3)

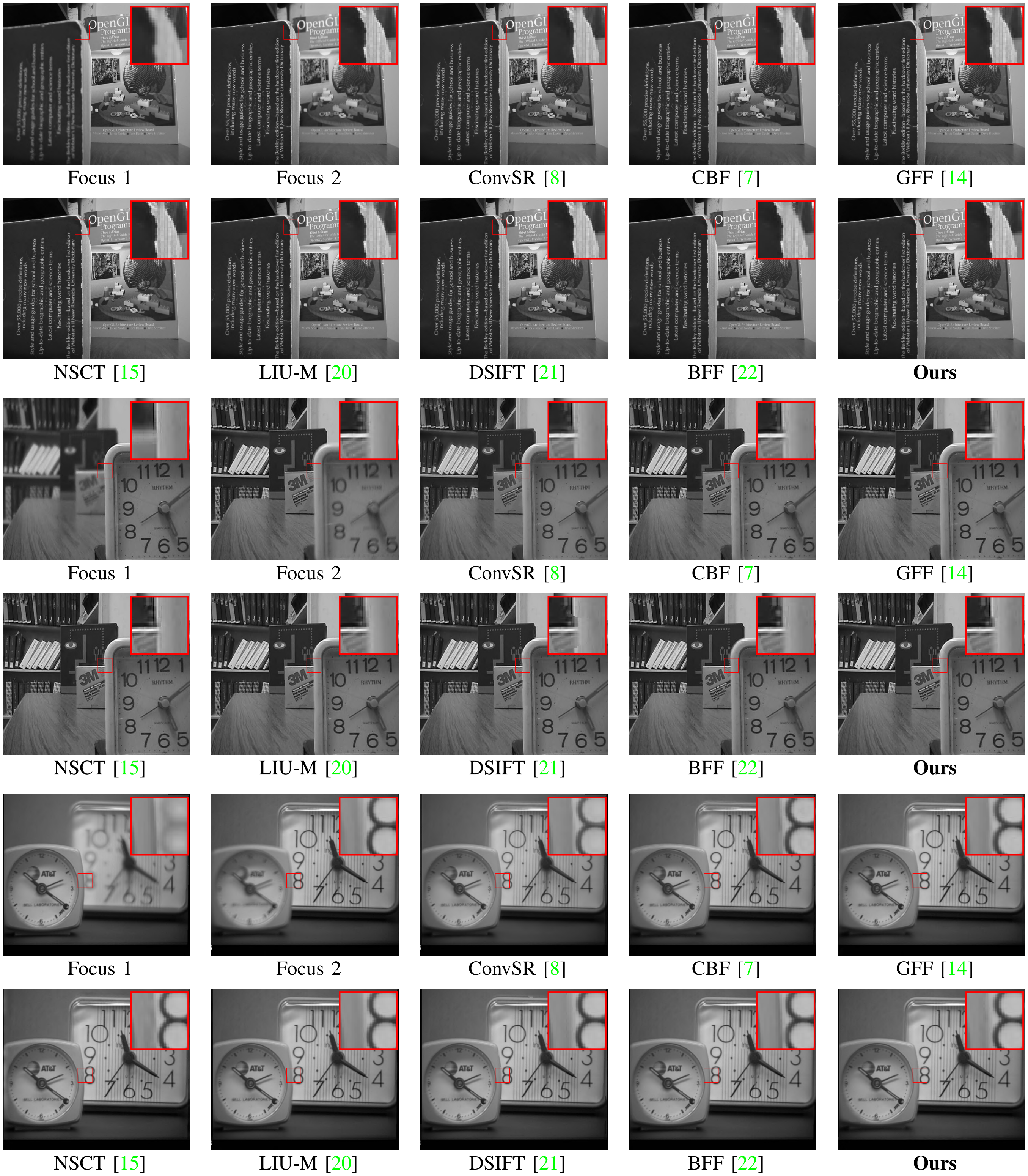

Fig. 7. Multi-focus images with fusion results obtained by different fusion methods. Insets are magnified $\times 4$. Best viewed on screen.

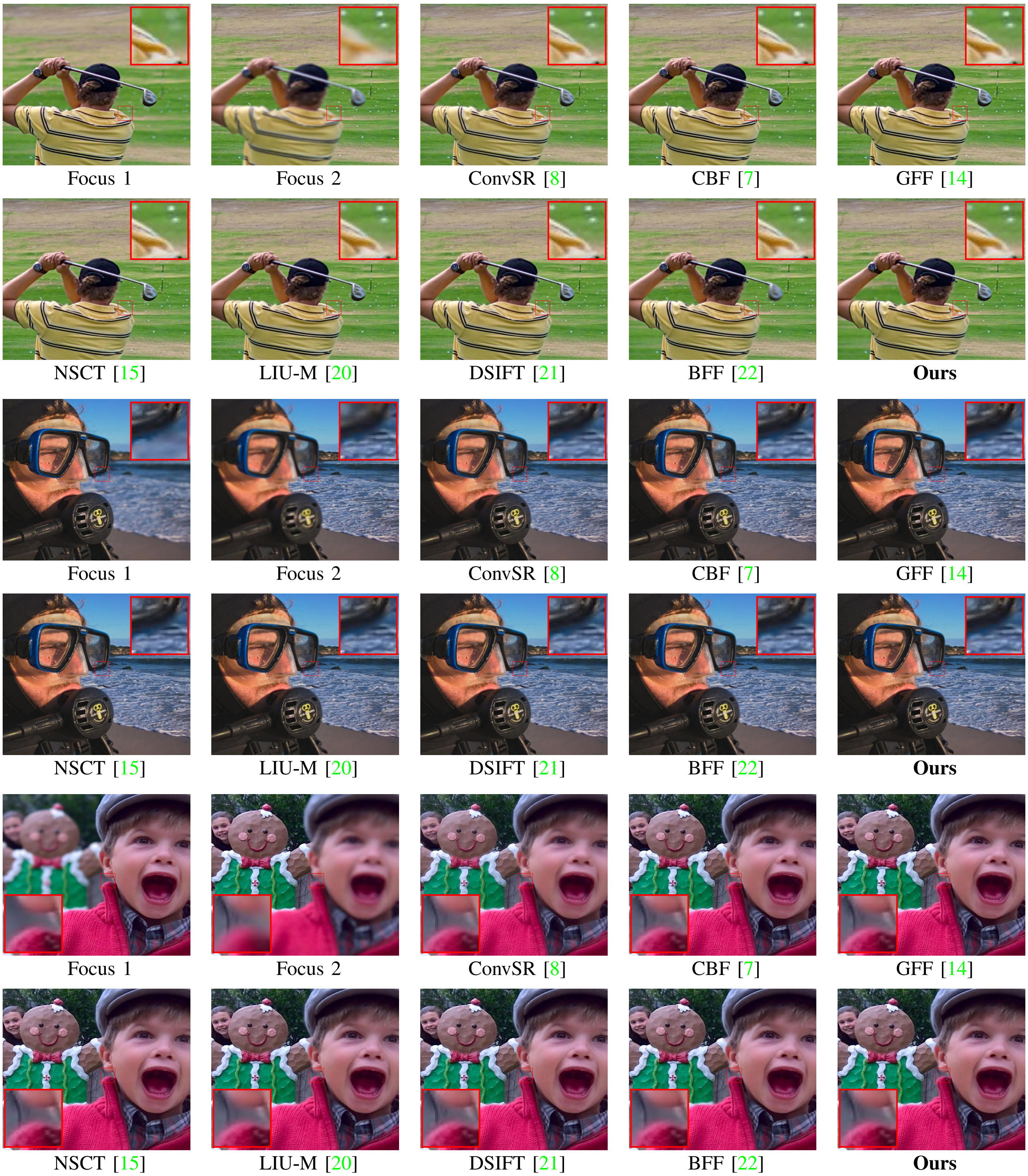

Fig. 8. Lytro images with fusion results obtained by different fusion methods. Insets are magnified $\times 4$. Best viewed on screen.

VII. Multi-exposure fusion (Sec. IV-F)

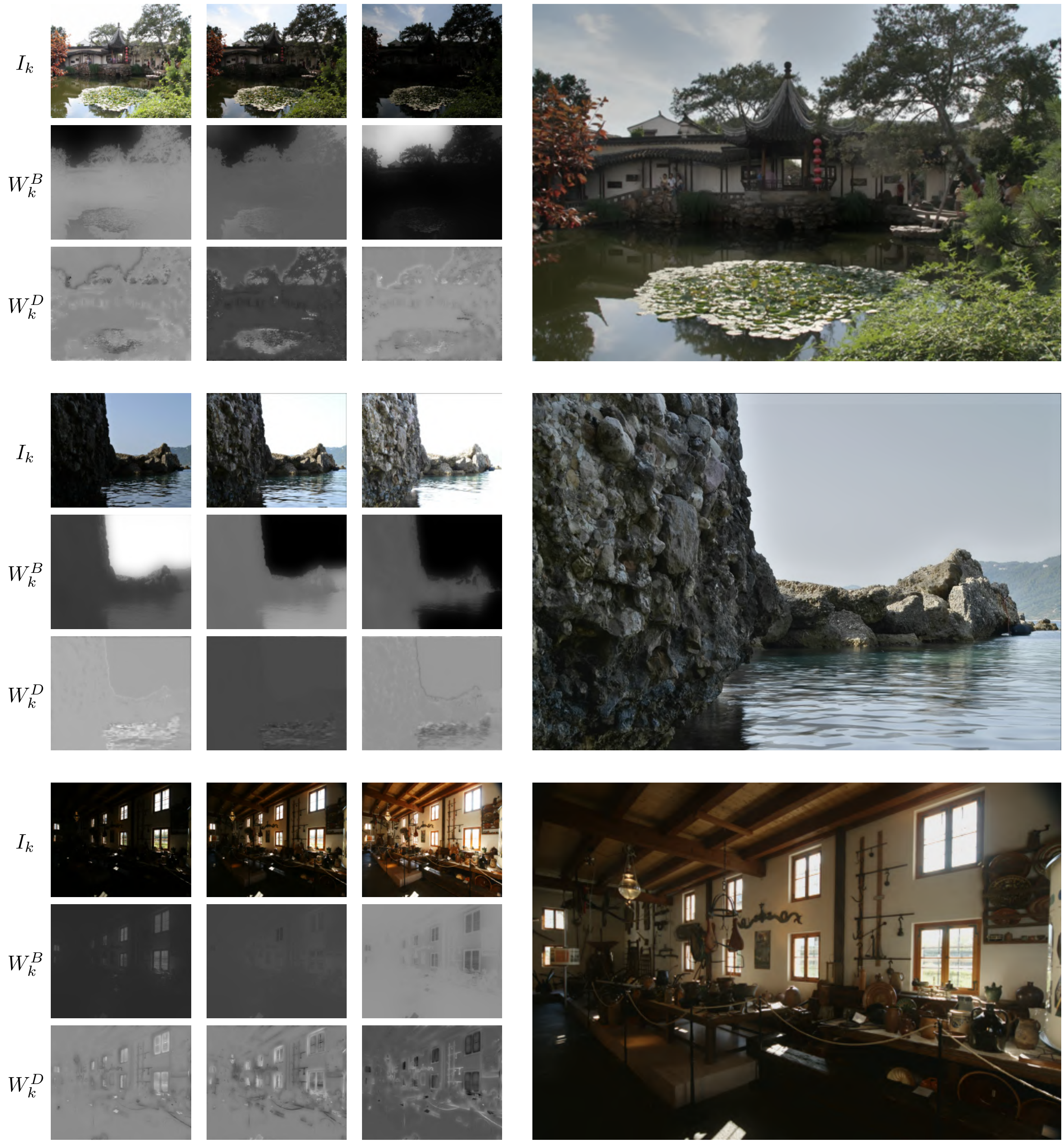

Fig. 9. Multi-exposure fusion examples. On the left side, the images are organized as sources (rows 1, 4, and 7), base weights (rows 2, 5, and 8), and detail weights (rows 3, 6, and 9). On the right side, the resulting image fusion is shown for each sequence. Best viewed on screen.

VIII. Data and code

Our code can be found at https://github.com/IVRL/Fast-Zero-Learning-Fusion.
For all the methods and metrics used in the paper please refer to their respective links below.

A. Datasets

- TNO https://figshare.com/articles/TNO_Image_Fusion_Dataset/1008029
- Whole Brain Atlas https://figshare.com/articles/TNO_Image_Fusion_Dataset/1008029
- Multi-focus https://sites.google.com/view/durgaprasadbavirisetti/datasets
- Lytro https://mansournejati.ece.iut.ac.ir/content/lytro-multi-focus-dataset
- Multi-exposure http://ivc.uwaterloo.ca/database/MEF/MEF-Database.php

B. Fusion methods

- CBF [7] https://sites.google.com/view/shreyamsha/publications
- ConvSR [8] http://www.escience.cn/people/liuyu1/Codes.html
- GTF [9] https://github.com/jiayi-ma/GTF
- LI [10] https://github.com/hli1221/imagefusion_deeplearning
- WLS [11] https://github.com/JinleiMa/Image-fusion-with-VSM-and-WLS
- JSR [12] https://github.com/hli1221/imagefusion_deeplearning
- JSRSD [13] https://github.com/hli1221/imagefusion_deeplearning
- GFF [14] http://xudongkang.weebly.com
- NSCT [15] https://sites.google.com/site/goravdma/Home/code/project1
- PCNN [16] http://www.escience.cn/people/xiaomi/index.html
- LP SR [17] http://www.escience.cn/people/liuyu1/Codes.html
- LIU [18] http://www.escience.cn/people/liuyu1/Codes.html
- PAPCNN [19] http://www.escience.cn/people/liuyu1/Codes.html
- LIU-M [20] http://www.escience.cn/people/liuyu1/Codes.html
- DSIFT [21] http://www.escience.cn/people/liuyu1/Codes.html
- BFF [22] https://github.com/uzeful/Boundary-Finding-based-Multi-focus-Image-Fusion

C. Fusion metrics

- VIFF [23] http://hansy.weebly.com/image-fusion-metric-ifm.html
- Q_{MI} [24] https://github.com/zhengliu6699/imageFusionMetrics
- Q_G [25] https://github.com/zhengliu6699/imageFusionMetrics
- Q_Y [26] https://github.com/zhengliu6699/imageFusionMetrics
- Q_C [27] https://github.com/zhengliu6699/imageFusionMetrics
- Q_P [28] https://github.com/zhengliu6699/imageFusionMetrics

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