Supplementary Material
for MRAD Network

This document serves as the supplement for MRAD Network. In this document, we provide the learned feature maps with the conventional MaxPooling and ReLU activation layers and our proposed spatial context-aware pooling (SCAP) and activation (SCAA) methods, and verify our proposed methods can attenuate the existed noise at some extent.
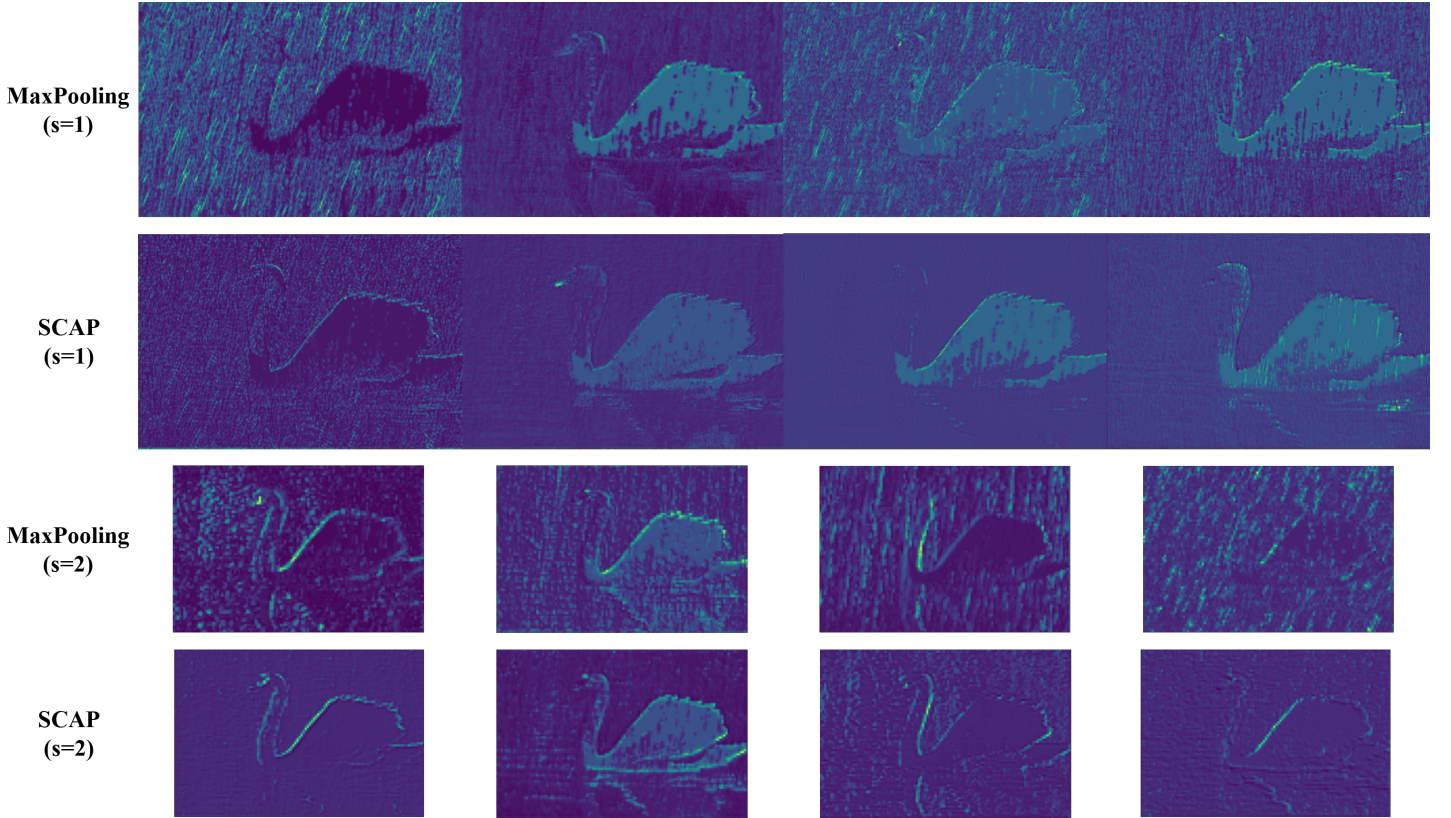

Figure 1: The visualized feature maps with the proposed SCAP and the conventional MaxPooling layers for one sample image.

1 The compared feature maps of the proposed SCAP and the conventional MaxPooling

Figures 1 and 2 manifest the visualization of several learned feature maps in our deraining network with the conventional MaxPooling layer and the proposed SCAP layer for two image samples. In our deraining network, we use three scales ($S = 3$ in MCAM module, and thus three SCAP layers are adopted to down-samples the previous scale of features maps to the small size of features. Since the feature maps in the final scale have of very small size, we only provided the compared feature maps in the first ans second scales ($s = 1, 2$. From Fig. 1 and 2, it can be seen that the proposed SCAP obtains more clear feature maps than the conventional MaxPooling, and at some extent attenuate the artifacts and noises in the input images.
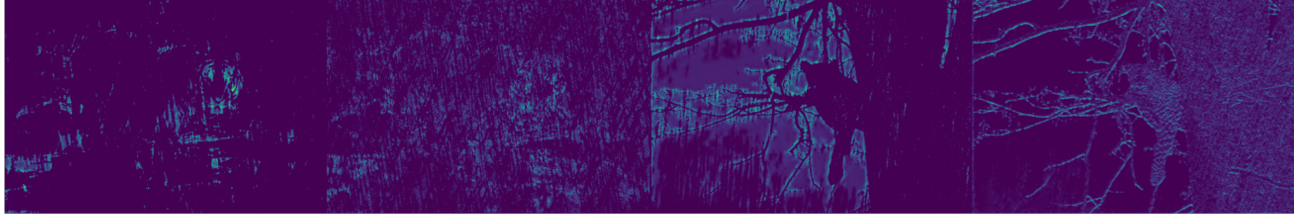

Figure 2: The visualized feature maps with the proposed SCAP and the conventional MaxPooling layers for another image.

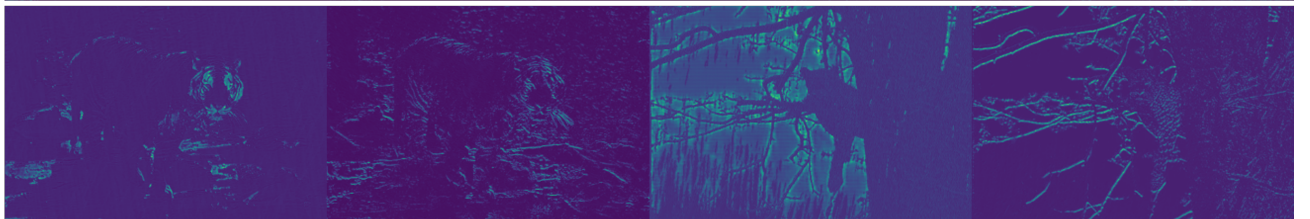# 2 The compared feature maps of the proposed SCAA and the conventional ReLU layers

Similarly, we also provide the compared visualizations of the learned feature maps by the proposed SCAA and the conventional ReLU layers in Fig. 3. Since all conventional ReLU layers in our deraining network are replaced by our proposed SCAA method, and the deraining performances are improved by the accumulated effect of all activation layers. The visualization of the learned feature maps only can be compared after a specific layer. and Fig. 3 visualizes several outputted feature maps of the late-term residual module after the ReLU and the proposed SCAA, which also manifests the clear features by our proposed SCAA method in spite of subtle difference.
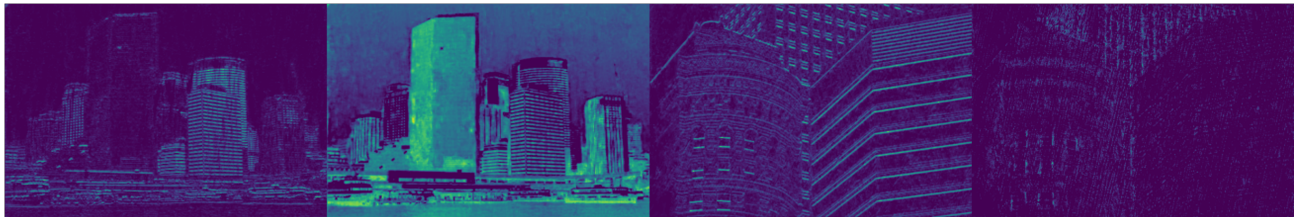
Figure 3: The visualized feature maps with the proposed SCAA and the conventional ReLU layers for four sample images.