



Figure 2. Details of the basic blocks. (a) SSC layer, (b) SSC block, (c) Conv layer, (d) DeConv layer.

linear layers are kept real-valued following previous methods [1–3]. We adopt our SFSC module in the SSC block for BSC-Manual and BSC-Net, which is detailed in next subsection.

A.2. Block Detail

We detail the structure of basic blocks contained in the binary FCN and UNET in Figure 2. For SSC layer, the projection indicates identity mapping when the input and output channel are equal, otherwise it is a 1-bit 1×1 convolution operation. For Conv and DeConv blocks, we keep the 1×1 convolution operation real-valued, which is proved to be essential for binarizing performance [2, 3].

B. Training Hyperparamters

There are 2 training stages when training BSC-Baseline and BSC-Manual while 3 stages when training BSC-Net. For all stages, we set max epoch as 128, weight decay as 0 and adopt Adam optimizer with a stepwise scheduler which steps at 60 and 100 epoch (reduce the learning rate by a factor of 10). The initial learning rates for the first and second stage when training BSC-Baseline and BSC-Manual are set to 0.001 and 0.0002. While for training BSC-Net, the initial learning rates for the three stages are set to 0.001, 0.001 and 0.0002. The weight of the confidence loss is set to 0.1 for FCN and 0.01 for UNET. Note that for training UNET-H on $2cm$ voxel, we double the max epoch and the stepping epochs as the huge network is hard to converge.

References

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