Supplementary Material

Different region number

In order to further explore the potential of our proposed DRConv, we analyse the influence of different region number on classification and face recognition. On classification, DRConv-ShuffleNetV2-0.5× is trained on ImageNet. On face recognition, DRConv-MobileFaceNet is trained on MS1M-V2 and evaluated on MegaFace. From Table 1, we can find that when the number of regions increases, the accuracy rises correspondingly. But when the number is more than 8, the improvement becomes minor gradually. On one hand, more regions mean that every group's context becomes more dedicated and the corresponding filter can reach a state of convergence more easily. On other hand, the number of meaningful visual elements is finite in a single image so that the gain becomes smaller with excessive region number.

Table 1. The influence of different region number (ShuffleNetV2-0.5× on ImageNet and MobileFaceNet on MegaFace)

Model	Region Num	Top-1 ACC.
DRConv-ShuffleNetV2-0.5×	2	63.1
	4	65.3
	8	67.1
	16	67.9
DRConv-MobileFaceNet	2	93.1
	4	94.3
	8	96.2
	16	96.8

Different spatial size

For the sake of better validating robustness of our method, we further explored DRConv's influence on layers with different spatial size. Table 2 shows that DRConv has positive effect for all layers, and these improvements can be accumulated when we use DRConv in more layers with different spatial size. Furthermore, because there is less noise disturbance in deeper layers, guided mask can form more dense regions and the distribution of filters is more accurate. Experimental results conform with our analysis that DRConv is more effective at deeper layers with smaller spa-

Table 2. The influence of different spatial size (Backbone: ShuffleNetV2-0.5×, Dataset: ImageNet)

56×56	28×28	14×14	7×7	Top-1 ACC.
				60.8
			✓	63.7
		✓	✓	66.0
	✓	✓	✓	66.7
✓	✓	✓	✓	67.1
✓	✓	✓		65.2
✓	✓			63.1
✓				61.4

tial size.