

Table 1. SPEAR reconstruction of the inputs to first linear layer of a VGG16 network on 100 IMAGENET batches of size  $b = 20$ . We report the mean absolute error (MAE) of the reconstruction, the percentage of successful reconstructions (Acc(%)), and the median number of iterations taken (Median  $n_{\text{iter}}$ ).

MAE	Acc(%)	Median $n_{\text{iter}}$
$1.30 \times 10^{-6}$	100	10000

Table 2. Comparison between the reconstructions of the inputs to different linear layers  $l$  ( $1 \leq l \leq 6$ ) of a network with total of  $L = 6$  layers and width  $m = 400$  on 100 TINYIMAGENET batches of size  $b = 20$ . We report the mean absolute error (MAE) of the reconstruction, the percentage of successful reconstructions (Acc(%)), and the median number of iterations taken (Median  $n_{\text{iter}}$ ).

$l$	MAE	Acc(%)	Median $n_{\text{iter}}$
1	$1.06 \times 10^{-6}$	100	36100000
2	$1.33 \times 10^{-6}$	100	31600000
3	$1.67 \times 10^{-6}$	100	84100000
4	$2.80 \times 10^{-6}$	99	181100000
5	$3.04 \times 10^{-6}$	83	840600000



Figure 1. A random sample of 6 images from the batch whose reconstruction is at the 10<sup>th</sup> PSNR percentile for a set of 100 batch reconstructions on  $L = 6, m = 200$  fully connected network and batches of size  $b = 20$  from the TINYIMAGENET dataset. We show SPEAR reconstruction (top), and compare them to the ground truth (bottom).



Figure 2. A random sample of 6 images from the batch whose reconstruction is at the 50<sup>th</sup> PSNR percentile for a set of 100 batch reconstructions on  $L = 6, m = 200$  fully connected network and batches of size  $b = 20$  from the TINYIMAGENET dataset. We show SPEAR reconstruction (top), and compare them to the ground truth (bottom).

Table 3. Comparison between the reconstructions of Geiping et al. [1] and a version of SPEAR that relies on the Geiping et al. reconstructions to choose which matrices  $L_A$  to subsample when applying Theorem 3.3. We report the results on 10 TINYIMAGENET batches for  $L = 6$  layer fully connected networks with two different widths  $m$ . We report percentage of successful reconstructions (Acc(%)) and the average PSNR for correctly recovered images (PSNR Rec) and all images (PSNR All).

Method	$b$	$m$	Acc(%)	PSNR All	PSNR Rec
Geiping et al. [1]	50	400	100	26.5	26.5
SPEAR - ours	50	400	100	124.5	124.5
Geiping et al. [1]	100	2000	100	32.8	32.8
SPEAR - ours	100	2000	60	81.5	119.9



Figure 3. A random sample of 6 images from the batch whose reconstruction is at the 90<sup>th</sup> PSNR percentile for a set of 100 batch reconstructions on  $L = 6, m = 200$  fully connected network and batches of size  $b = 20$  from the TINYIMAGENET dataset. We show SPEAR reconstruction (top), and compare them to the ground truth (bottom).