Achieving More with Less: Additive Prompt Tuning for Rehearsal-Free Class-Incremental Learning

Supplementary Material

1. Additional Benchmark Evaluation

Method	Split EuroSAT		Split RESISC45		Split CropDisease	
	Avg Acc(↑)	Forget.(↓)	Avg Acc(↑)	Forget.(↓)	Avg Acc(↑)	Forget.(↓)
L2P	67.25	14.81	71.52	10.75	75.32	7.68
DualPrompt	75.82	10.27	75.27	8.33	78.15	7.01
Coda-Prompt	74.52	11.25	77.51	7.68	81.26	5.37
ESN	80.42	6.08	76.52	8.46	83.20	6.72
OVOR-Deep	79.99	10.04	79.11	9.32	86.11	4.85
CPrompt	82.55	8.96	81.27	7.75	85.09	5.31
APT (Ours)	**86.63**	7.03	**84.18**	6.02	**89.96**	3.91

Table 1. Additional results on more challenging benchmarks.

To provide a more comprehensive evaluation of the proposed APT, we incorporate additional experiments using Split EuroSAT and Split RESISC45 (aerial domain), as well as Split CropDisease (medical domain). The results, presented in the table above, demonstrate that our method consistently outperforms other approaches.

2. Additional Ablation Study

To further validate our architectural design, we conduct an ablation study focusing on three key aspects: (1) adding prompts into different projection matrices of the self-attention mechanism; (2) adding prompts at different selection of transformer layers; and (3) adding prompts to image tokens beyond the [CLS] token. The corresponding results are summarized in the table below. As shown, our current choice of APT consistently achieves the best results.

Method	Split CIFAR-100		Split ImageNet-R	
	Avg Acc(↑)	Forgetting(↓)	Avg Acc(↑)	Forgetting(↓)
add QK	$86.63_{\pm0.68}$	$5.75_{\pm0.28}$	$77.54_{\pm0.54}$	$5.17_{\pm0.32}$
add QV	$88.42_{\pm0.49}$	$4.05_{\pm0.32}$	$79.12_{\pm0.35}$	$4.63_{\pm0.17}$
First 6 layers	$87.23_{\pm0.55}$	$5.24_{\pm0.55}$	$78.33_{\pm0.72}$	$5.44_{\pm0.32}$
Last 6 layers	$87.56_{\pm0.43}$	$4.77_{\pm0.25}$	$78.12_{\pm0.32}$	$4.67_{\pm0.46}$
Odd layers	$88.23_{\pm0.45}$	$4.24_{\pm0.27}$	$78.77_{\pm0.68}$	$4.18_{\pm0.56}$
Even layers	$88.15_{\pm0.72}$	$3.88_{\pm0.31}$	$78.61_{\pm0.52}$	$4.11_{\pm0.22}$
Pad first 10 image tokens	$88.52_{\pm0.50}$	$4.01_{\pm0.57}$	$\mathbf{79.61}_{\pm0.40}$	$4.22_{\pm0.31}$
Pad last 10 image tokens	$88.75_{\pm0.71}$	$3.92_{\pm0.33}$	$79.43_{\pm0.35}$	$4.01_{\pm0.42}$
APT (Ours)	$\mathbf{88.88}_{\pm0.65}$	$3.47_{\pm0.55}$	$79.40_{\pm0.47}$	$4.38_{\pm0.46}$

Table 2. Ablation on architectural choice.