A. Appendix

A.1. Analysis on Hyperparameter S

The parameter S in Eq. (12) denotes the size of the sliding window used to accumulate frequencies for basis selection. To analyze its impact, we computed the top-10 selected basis indices in the final layer for a task on CIFAR-100, varying S from 1 to 100. As shown in Figure 4, the set of selected indices stabilizes very quickly. The indices chosen with a small window (e.g., $S = 50$) are nearly identical to those chosen with a full window ($S = 100$, equivalent to all training steps). This indicates that a short-term memory of perturbation sensitivity is sufficient for robust basis selection, justifying our choice of $S = 50$ for efficiency.

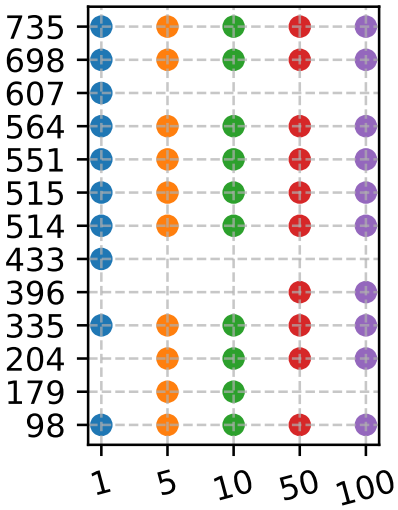

Figure 4. Top-10 selected basis indices (y-axis) for the next task as a function of the sliding window size S (x-axis). Each colored line tracks a specific basis index. The selection stabilizes with a small S.

A.2. Analysis on Hyperparameter ρ

The hyperparameter ρ controls the perturbation magnitude in our min-max objective (Eq. (8)). We performed an ablation study on *ImageNet-R* ($N = 5$) to determine its optimal value. The results are shown in Table 8. A value of $\rho = 0.01$ provides the best balance, leading to the highest performance. Larger values (e.g., 0.1) or smaller values (e.g., 0.001) resulted in slightly degraded performance, demonstrating the model's sensitivity to this parameter.

A.3. Discussion on Backward Transfer

Our work prioritizes stability, using strict orthogonal subspaces to effectively mitigate catastrophic forgetting, a success confirmed by our strong empirical results. This focus on interference prevention, however, means that PLAN does not explicitly facilitate positive backward transfer. Given that significant backward transfer is rarely observed in rehearsal-free CL, this represents a deliberate design choice. For future work, we believe exploring methods to dynamically adjust the degree of orthogonality could unlock opportunities for knowledge sharing across tasks while maintaining robustness.

Table 8. Ablation study on ρ on *ImageNet-R* ($N = 5$).

ρ	**Acc (%)**	**AAA (%)**
0.1	75.23	78.94
0.01	**77.79**	**81.93**
0.001	76.38	79.36