Appendix

A Max-Entropy Analysis

Tab. 1 demonstrates the orthogonality of max-entropy calibration across various class-incremental methods under different MLCIL scenarios and evaluation metrics. These results prove that max-entropy regularization can significantly enhance the performance of different methods.

Table 1: Max-entropy analysis in {B0-C10 and B0-C5} of MS-COCO.

Method	MS-COCO B0-C10				MS-COCO B0-C5			
	Last Acc			Avg.Acc	Last Acc			Avg.Acc
	mAP	CF1	OF1	mAP	mAP	CF1	OF1	mAP
LwF	42.4	45.3	43.7	61.2	35.9	30.0	28.0	54.9
LwF (w/ H)	47.6	50.3	49.5	63.1	39.2	35.4	33.1	57.3
AGCN	62.7	53.9	56.9	72.7	49.2	41.0	38.8	61.8
AGCN (w/ H)	64.1	57.1	59.1	73.7	54.0	44.9	41.3	65.2
CSC (w/o H)	69.3	59.0	59.5	75.6	64.8	42.6	39.5	73.4
CSC (w/ H)	72.8	64.9	66.8	78.0	67.3	50.5	47.2	75.0

B Sensitive Study

α sensitive study in MS-COCO {B0-C10}(fixing β=0) is shown in Fig. 1.

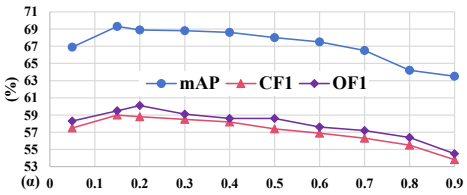

Fig. 1: α sensitive study.

C CI-GCN Design

In MS-COCO {B0-C10}, comprehensive ablations of CI-GCN is shown in Tab. 2: "G" and "S" are general and specific CM, G→S performs better.

Table 2: Ablations of CI-GCN.

Structure	Last Acc			Avg.Acc
	mAP	CF1	OF1	mAP
S	71.1	63.5	65.5	76.3
G	71.8	64.4	65.8	76.8
S $\rightarrow$ G	71.5	63.9	65.3	76.6
G $\rightarrow$ S	**72.8**	**64.9**	**66.8**	**78.0**

D Evaluation Metric

Multi-label evaluation. Following MLCIL methods, we use the per-class F1 (CF1), overall F1 (OF1) as well as the mean average precision (mAP) to evaluate the MLCIL model, formulated by:

$$\text{OP} = \frac{\sum_i N_i^c}{\sum_i N_i^p}, \qquad \text{CP} = \frac{1}{C}\sum_i \frac{N_i^c}{N_i^p},$$
$$\text{OR} = \frac{\sum_i N_i^c}{\sum_i N_i^g}, \qquad \text{CR} = \frac{1}{C}\sum_i \frac{N_i^c}{N_i^g},$$
$$\text{OF1} = \frac{2 \times \text{OP} \times \text{OR}}{\text{OP} + \text{OR}}, \quad \text{CF1} = \frac{2 \times \text{CP} \times \text{CR}}{\text{CP} + \text{CR}},$$

where i is the class label and C is the number of labels. N_i^c is the number of correctly predicted images for class i, N_i^p is the number of predicted images for class i and N_i^g is the number of ground-truth for class i.