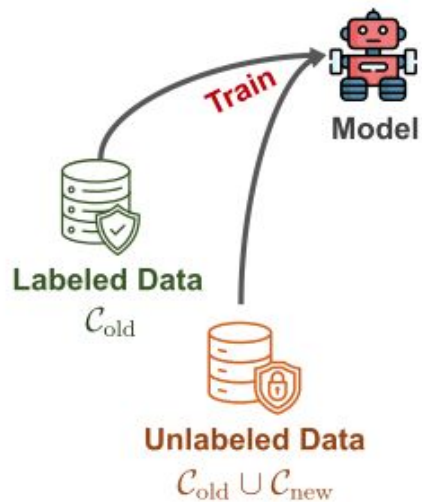# Active Generalized Category Discovery

Shijie Ma1,2 , Fei Zhu3 , Zhun Zhong4,5 , Xu-Yao Zhang1,2*, Cheng-Lin Liu1,2
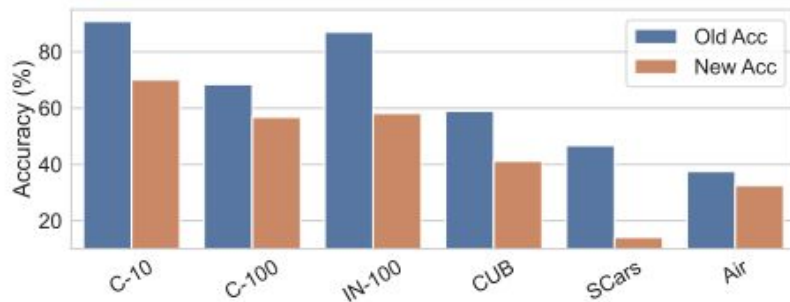
- **Problem/Objective**
    - GCD의 poor performance on fully unlabeled new classes.

- **Contribution/Key Idea**
    - AGCD
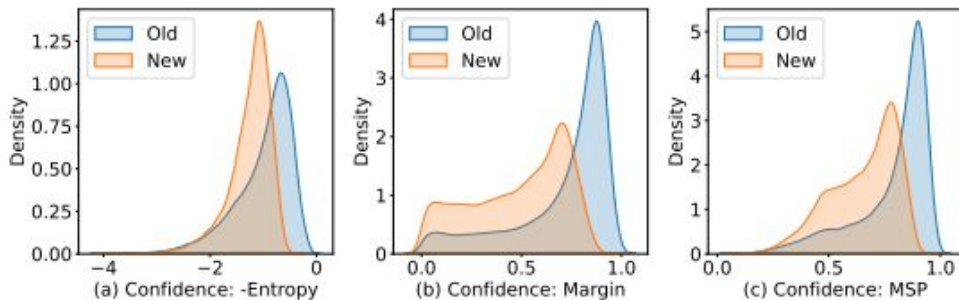
전유진

- GCD(Generalized Category Discovery)

Train

Model

Labeled Data
$\mathcal{C}_{old}$

Unlabeled Data
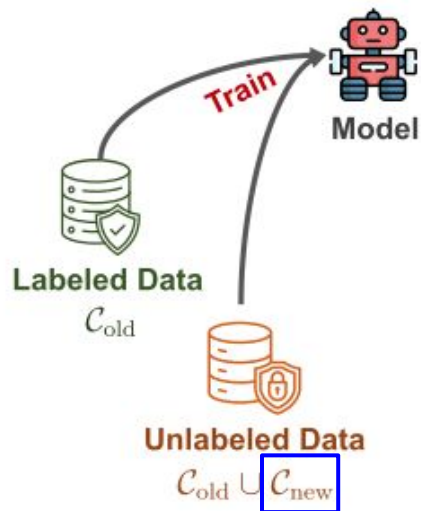$\mathcal{C}_{old} \cup \mathcal{C}_{new}$

전유진

- GCD의 문제

1. Severe performance mismatch b/w old and new classes.

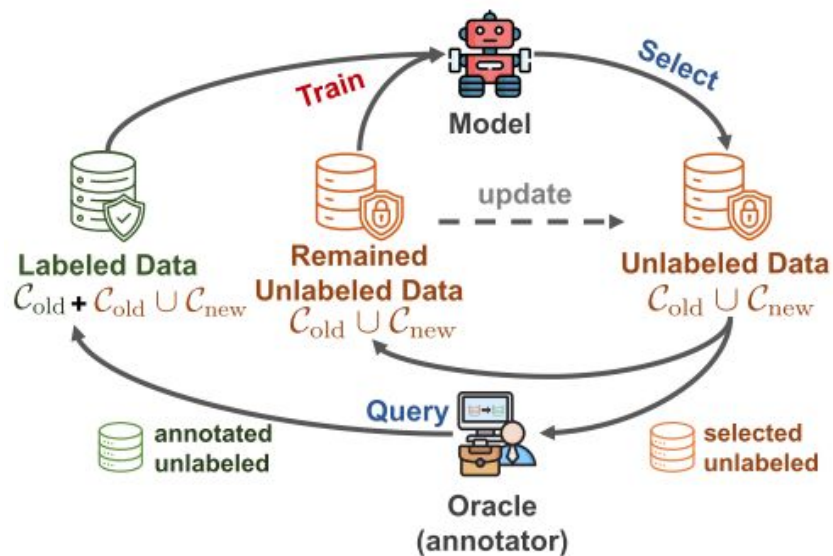2. Inconsistent confidence b/w old and new classes.

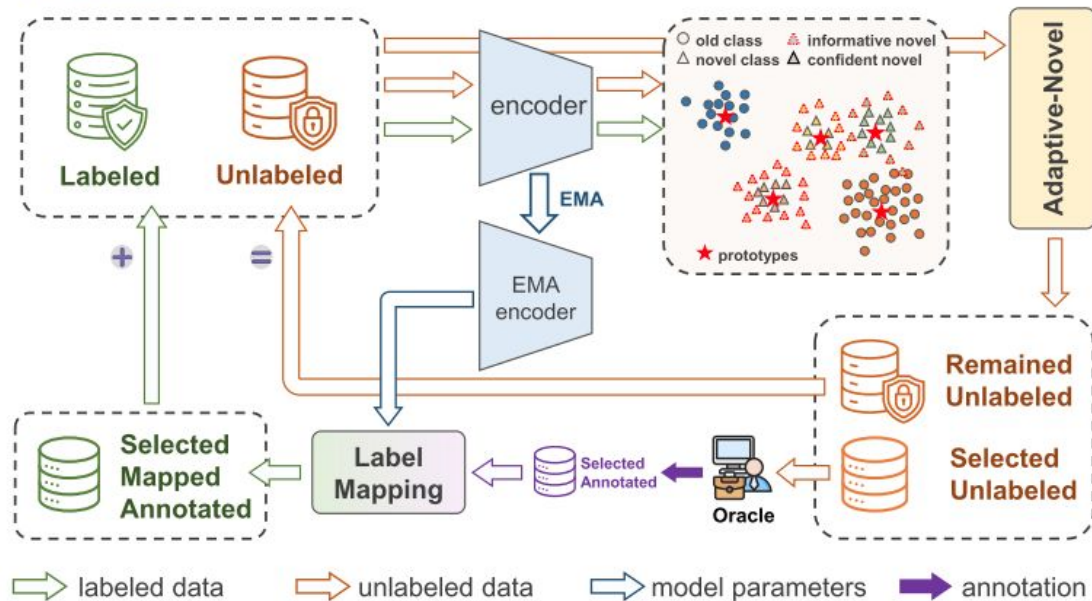
전유진

- GCD 문제의 원인

: fully unlabeled new classes

전유진

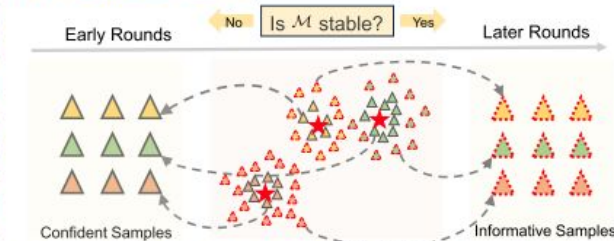- AGCD(Active Generalized Category Discovery)
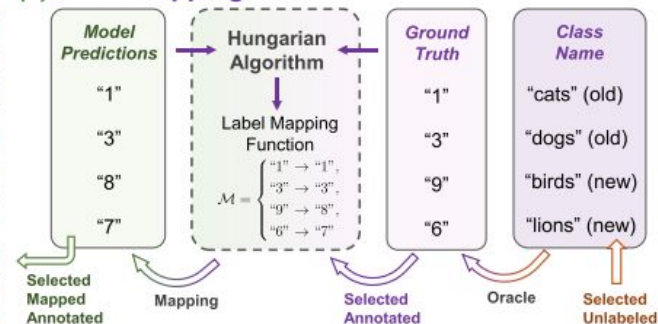

전유진

● AGCD(Active Generalized Category Discovery)
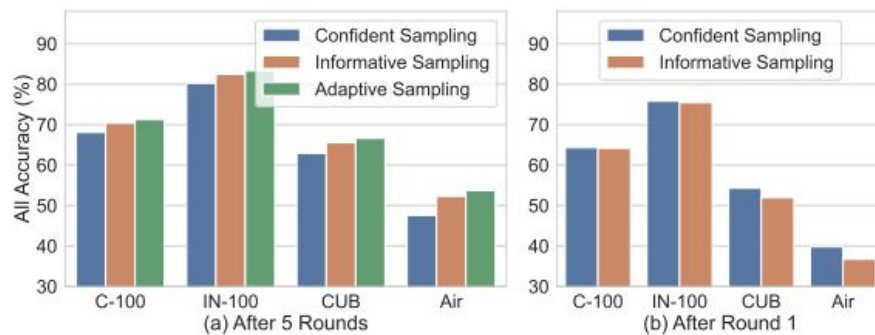

(a) Overview

(b) Adaptive-Novel

(c) Label Mapping

전유진

- Experiments

Type	AL Strategies	CIFAR10			CIFAR100			ImageNet-100		
		All	Old	New	All	Old	New	All	Old	New
Baseline	w/o AGCD	74.22	90.80	70.07	62.62	68.46	56.78	72.56	87.00	58.12
	Random	82.74	93.05	80.16	67.28	74.52	60.04	79.16	89.40	68.92
Unc.	Entropy [53]	76.25	95.55	71.43	64.59	73.94	55.24	75.96	91.04	60.88
	LeastConf [53]	78.32	**96.00**	73.90	65.63	**76.74**	54.52	76.82	91.92	61.72
	Margin [40]	92.34	94.35	91.84	69.08	75.58	62.58	80.46	92.40	68.52
Rep./Div.	KMeans [32]	91.18	93.10	90.70	66.70	72.66	60.74	78.18	90.08	66.28
	CoreSet [42]	85.51	94.95	83.15	65.72	77.64	53.80	78.08	91.92	64.24
	BADGE [3]	92.31	94.75	91.70	67.22	73.70	60.74	81.48	**92.68**	70.28
Ours	Adaptive-Novel	**93.15**	94.55	**92.80**	**71.25**	75.72	**66.78**	**83.34**	90.20	**76.48**

전유진

- Experiments

Type	Query Strategies	CUB			Stanford Cars			FGVC-Aircraft		
		All	Old	New	All	Old	New	All	Old	New
Baseline	w/o AGCD	50.17	58.95	41.18	30.12	46.71	14.12	35.01	37.53	32.49
	Random	62.74	64.88	60.62	44.12	53.44	35.13	50.41	51.38	49.43
Unc.	Entropy [53]	62.82	**69.52**	56.19	42.40	53.75	31.44	43.89	51.92	35.86
	LeastConf [53]	61.48	66.12	56.87	45.82	55.32	36.65	44.91	50.42	39.40
	Margin [40]	65.08	68.41	61.79	46.03	57.67	34.79	51.37	**52.46**	50.27
Rep./Div.	KMeans [32]	61.30	68.27	54.40	40.79	52.99	29.03	51.58	51.08	52.07
	CoreSet [42]	63.44	65.95	60.96	42.52	52.00	33.37	45.03	51.68	38.38
	BADGE [3]	65.84	69.00	62.71	45.82	54.41	37.53	52.03	51.68	52.37
Ours	Adaptive-Novel	**66.62**	66.54	**66.70**	**48.36**	**57.73**	**39.34**	**53.74**	51.50	**55.98**

전유진

- Ablation study

(a) After 5 Rounds

(b) After Round 1

- Ablation study

(a) Accuracy

(b) Label Mapping

전유진

- Result

(a) Before AGCD: -Entropy

(b) After AGCD: -Entropy

전유진