

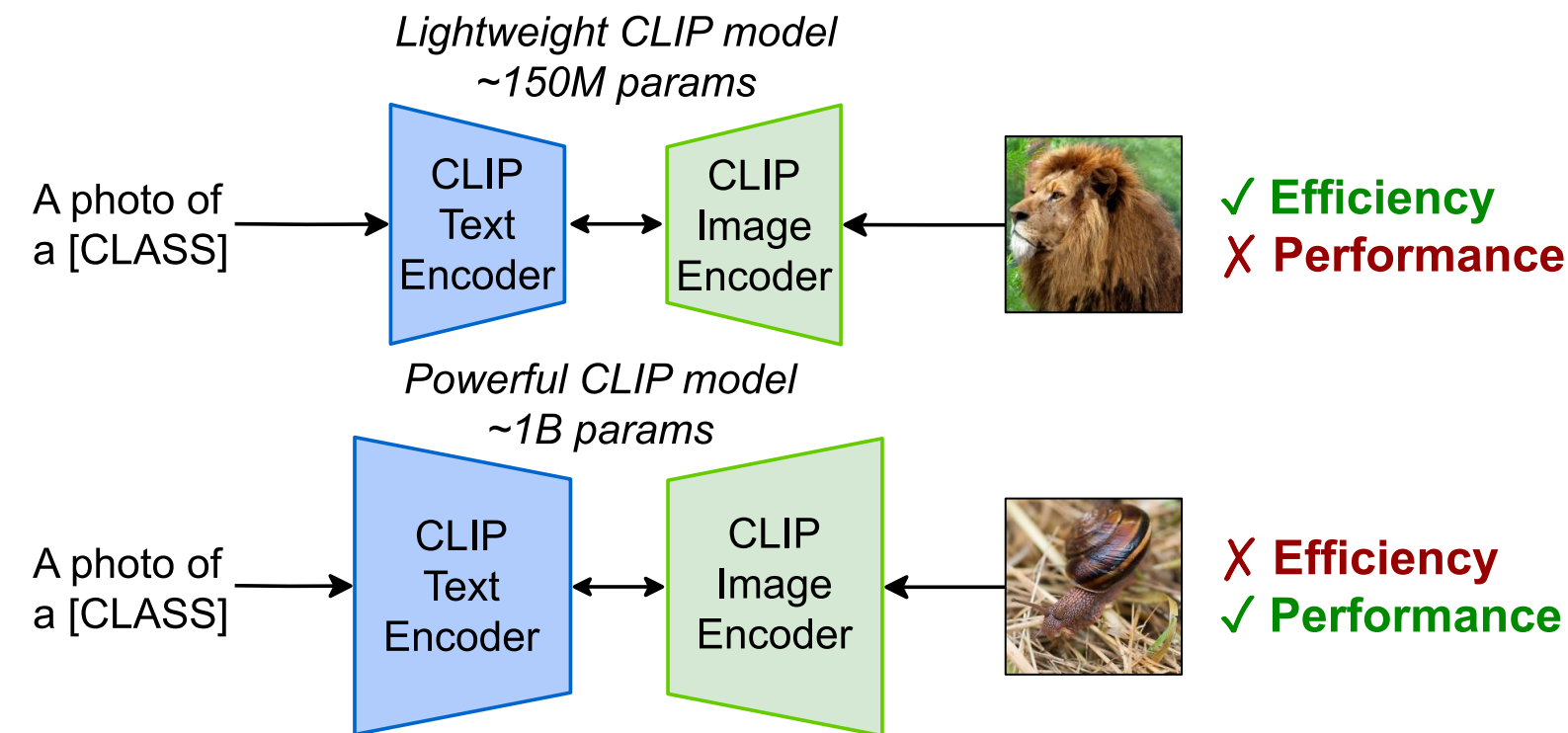
Improving Zero-shot Generalization of Learned Prompts via Unsupervised Knowledge Distillation

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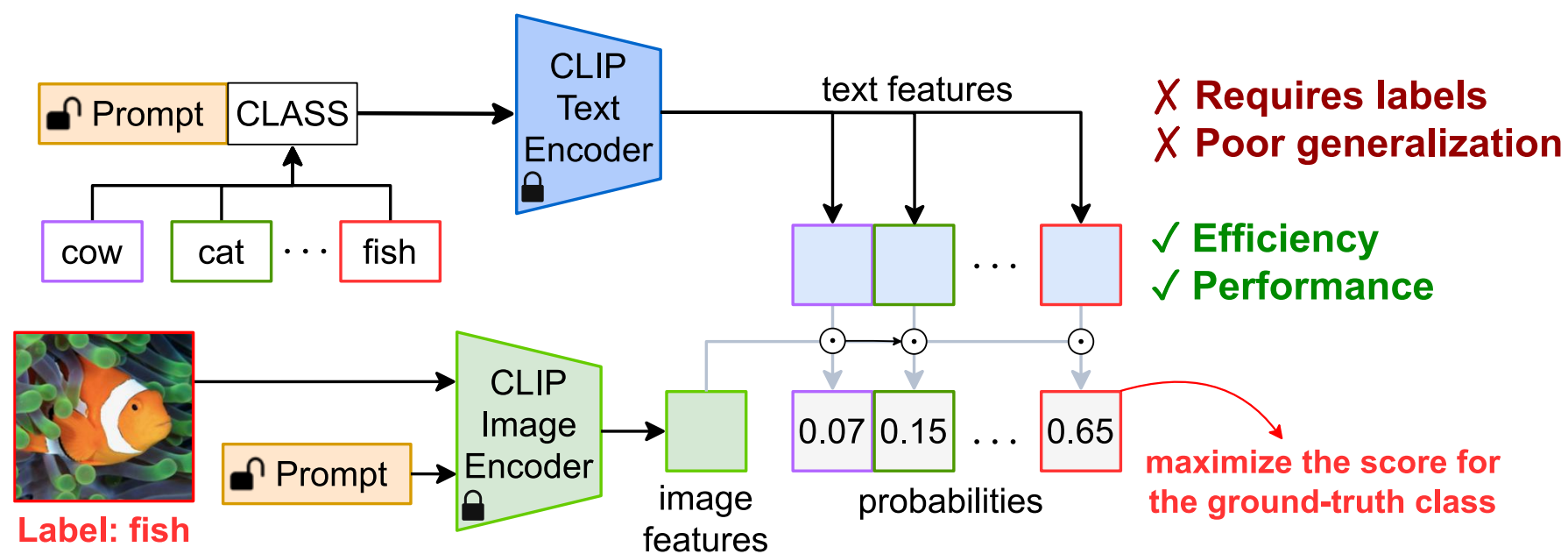
Motivation

Larger CLIPs are powerful but are not efficient. Fine-tuning smaller CLIPs is expensive.



Current Limitations

Prompt Learning is an efficient solution, but the best performing techniques require ground-truth labels.

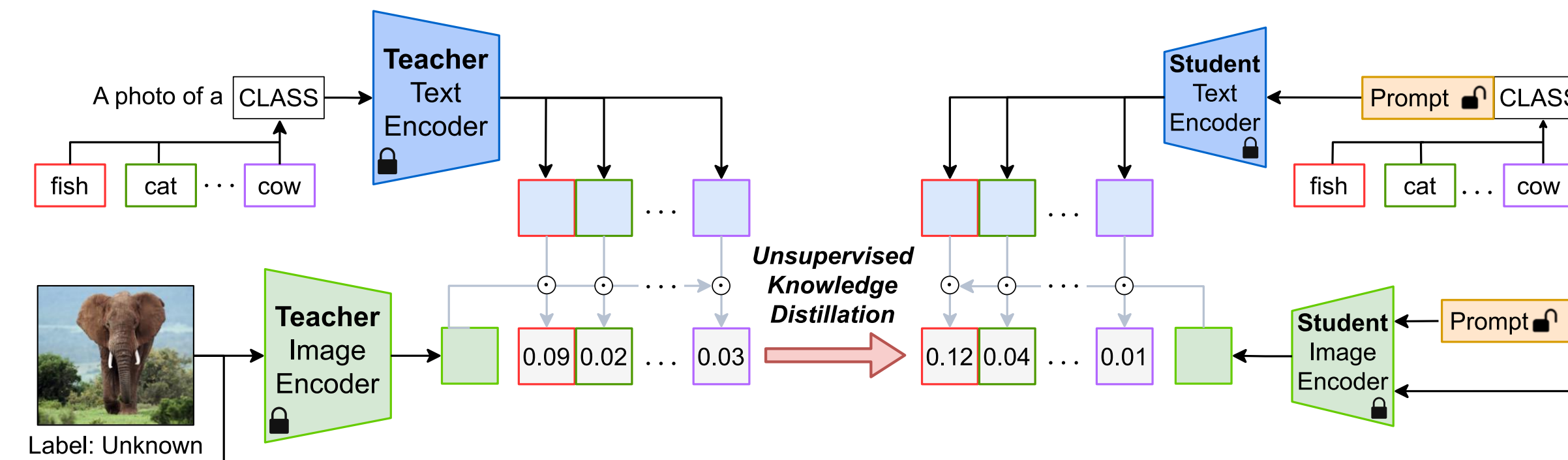


Contributions

- We propose **KDPL**, that leverages a Teacher model to make any prompt learning technique unsupervised.
- Additionally, **KDPL-CA** can be applied without knowledge of training class names.

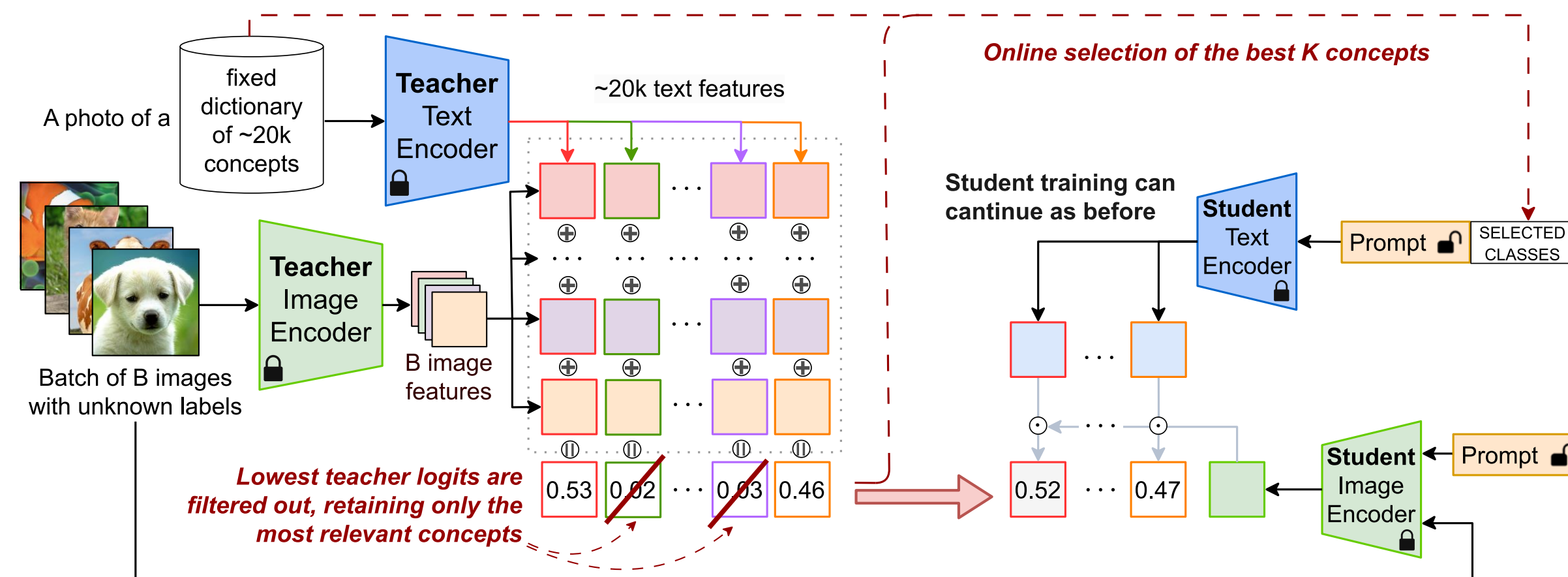
Knowledge Distillation for Prompt Learning: KDPL

KDPL can be integrated with any existing prompt learning technique and eliminates the need for labels.



Class Agnostic KDPL : KDPL-CA

What can we do when we know neither the labels nor the class names?

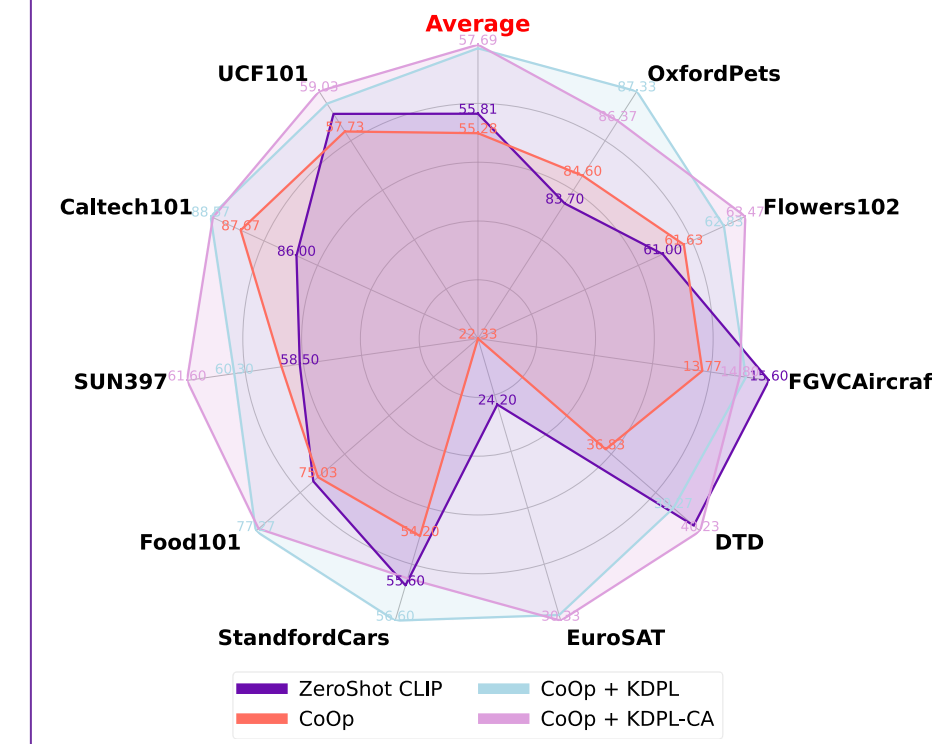


- **KDPL-CA** does not require labels or training class names,
- It is parameter- and computationally-efficient,
- It improves zero-shot generalization of few-shots adaptation.

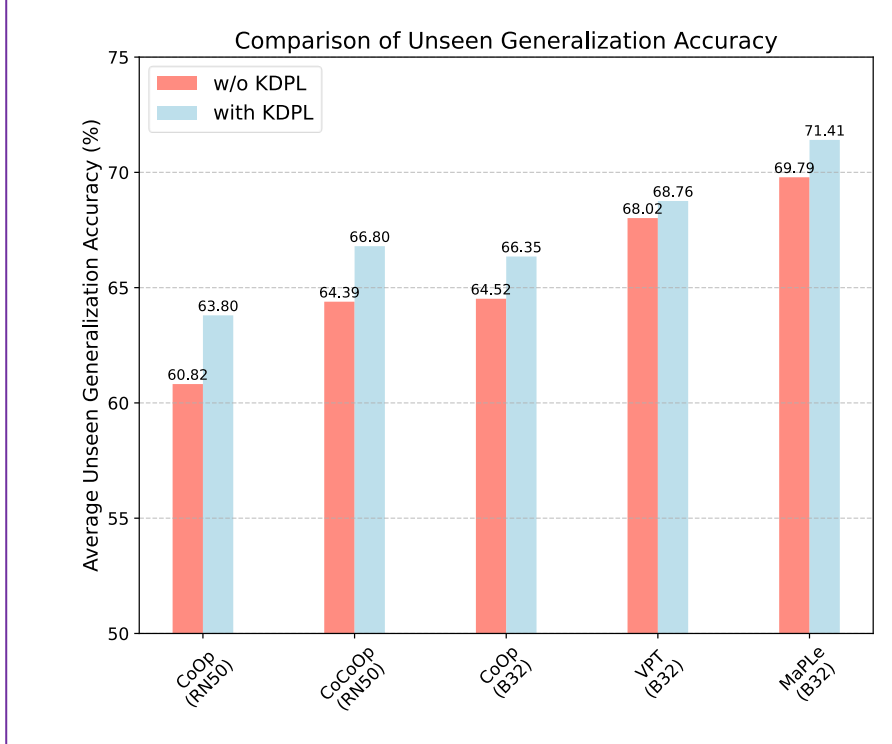
Cross Domain Generalization

Backbone	Method	ImageNet	-V2	-S	-A	-R	Average
RN50	CoOp	62.40	55.17	33.70	23.13	56.20	42.05
	CoOp + KDPL	62.73	55.37	35.20	23.27	57.77	42.90
	CoOp + CA-KDPL	61.83	54.27	35.20	23.50	59.10	43.02
	CoCoOp	63.07	55.53	34.77	23.73	59.47	43.38
	CoCoOp + KDPL	62.70	55.60	35.30	23.43	57.90	43.06
	CoCoOp + CA-KDPL	61.43	54.53	35.33	23.77	59.10	43.18
ViT-B/32	CoOp	66.33	58.30	41.40	31.47	65.87	49.26
	CoOp + KDPL	65.97	58.10	42.50	31.63	67.37	49.90
	CoOp + CA-KDPL	64.73	56.93	42.27	31.47	67.83	49.63
	VPT	64.97	56.73	41.27	27.00	66.50	47.88
	VPT + KDPL	65.10	57.37	41.67	27.77	67.47	48.57
	VPT + CA-KDPL	63.73	55.83	41.10	27.33	67.30	47.89
MaPLe	MaPLe	66.80	58.53	42.23	30.13	66.40	49.32
	MaPLe + KDPL	66.50	58.47	42.77	29.87	67.70	49.70
	MaPLe + CA-KDPL	65.23	57.43	42.07	30.00	67.63	49.28

Cross Datasets



Base to Unseen



TL;DR - Paper in 30 seconds!

Existing SOTA prompt learning techniques require annotated samples.

KDPL replaces the need for labels with a Teacher needed only at training time. The method is independent of prompt learning technique and architecture used.

KDPL-CA improves zero-shot generalization even without knowledge of training class names.