

Introduction

Motivation

Learning **feature** representations from **unlabelled datasets** and transfer to **novel downstream tasks** when **limited** labelled **data** of unseen classes is available.

Challenges

- **Meta-learning** from unlabelled datasets requires an automated way to **create meaningful tasks**.
- Unsupervised meta-learning has usually worked well for **small, in-domain** datasets.
- **Adaptation** steps may require non-negligible **time**.

Our Contribution

- A novel **task creation mechanism** for unsupervised meta-learning.
- An **in-context learner** to solve unseen test task with no adaptation.
- Training on **large-scale, unlabelled** dataset to generalize to **cross-domain** scenarios.
- Fast and lightweight inference.

Takeaway

Meta-learning a transformer on a **large-scale, unlabelled dataset** enables efficient few-shot inference with **no adaptation**, even on **unseen domains**.

See Also



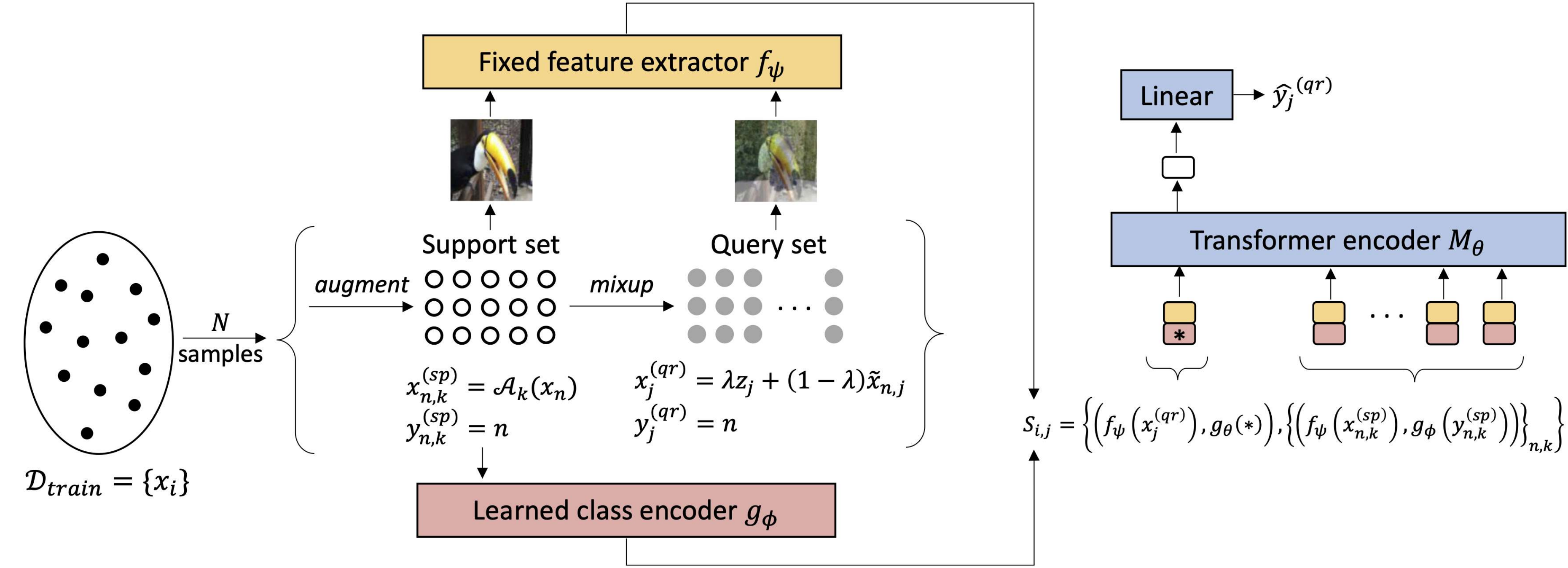
Paper



Code

Approach

The Model



Experimental Results

Method	miniImageNet		CIFAR-fs		CUB		Aircraft		Meta-iNat	
	5w1s	5w5s	5w1s	5w5s	5w1s	5w5s	5w1s	5w5s	5w1s	5w5s
In-Domain										
CACTUs-MAML	43.30	54.21	42.00	56.64	31.19	36.81	24.06	27.26	20.13	21.84
CACTUs-ProtoNet	48.85	62.52	50.90	64.52	33.93	44.41	26.27	30.88	27.30	29.08
UMTRA	39.93	50.73	32.93	46.13	27.06	36.6	22.40	31.73	28.96	37.12
Meta-GMVAE	55.38 [†]	65.10 [†]	52.02	64.18	33.59	39.09	24.83	27.60	34.22	40.23
PsCo	47.29	64.85	42.21	62.92	33.09	51.02	26.19	38.80	36.97	55.88
Cross-Domain										
PsCo	67.89	90.17	53.34	76.22	43.35	70.19	29.87	38.20	46.21	70.05
CAMeLU	76.51	92.14	61.79	80.43	65.52	80.35	33.17	39.11	57.27	75.45
CAML (supervised)	81.75	92.31	59.44	75.27	54.63	66.81	28.92	32.06	50.86	67.07

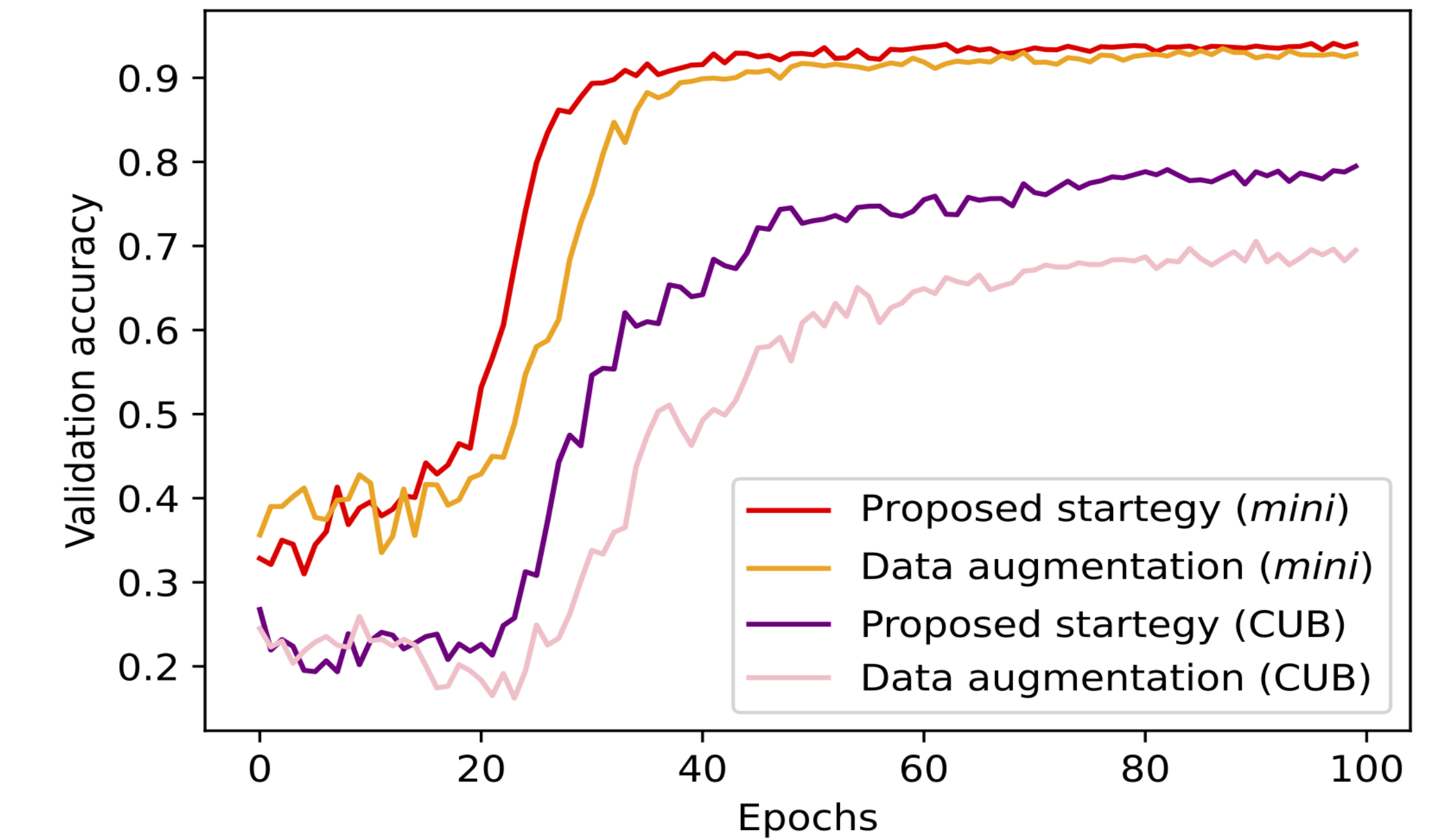
Accuracy (%) on 5way-5shot tasks. Symbol † indicates data leakage.

Computational Resources

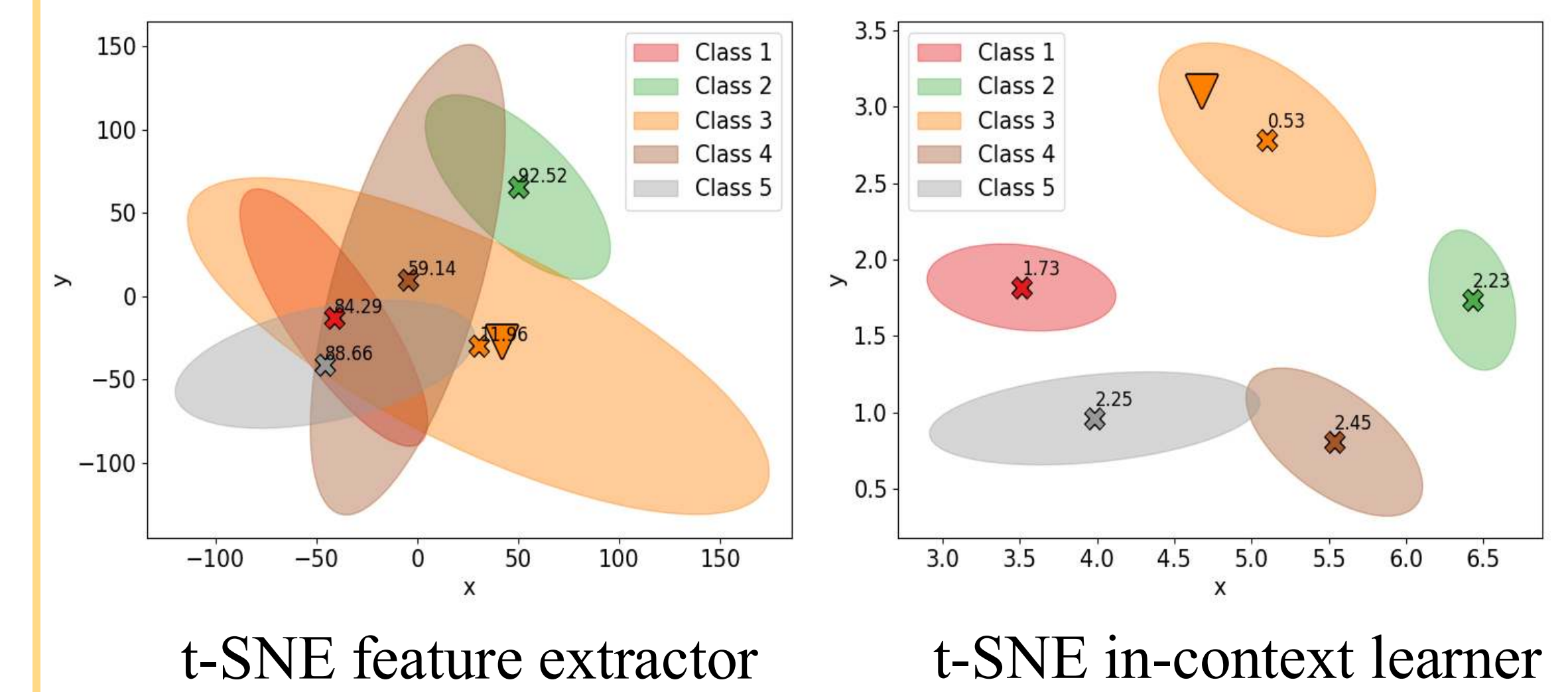
	Time task construction (ms)		Training time (ms/epoch)		Inference time (ms/task)	
	PsCO	CAMeLU	PsCO	CAMeLU	PsCO	CAMeLU
	20772	1376	4613656	153000	605	57
	GPU training (MiB)	CPU training (MiB)	GPU inference (MiB)	CPU inference (MiB)		
	PsCO	43904	20904	1630	2061	
CAMeLU	6250	2588	3224	1667		

Insights

Evaluation of Augmentation Strategy



Feature Space Representation



Learning Trend

