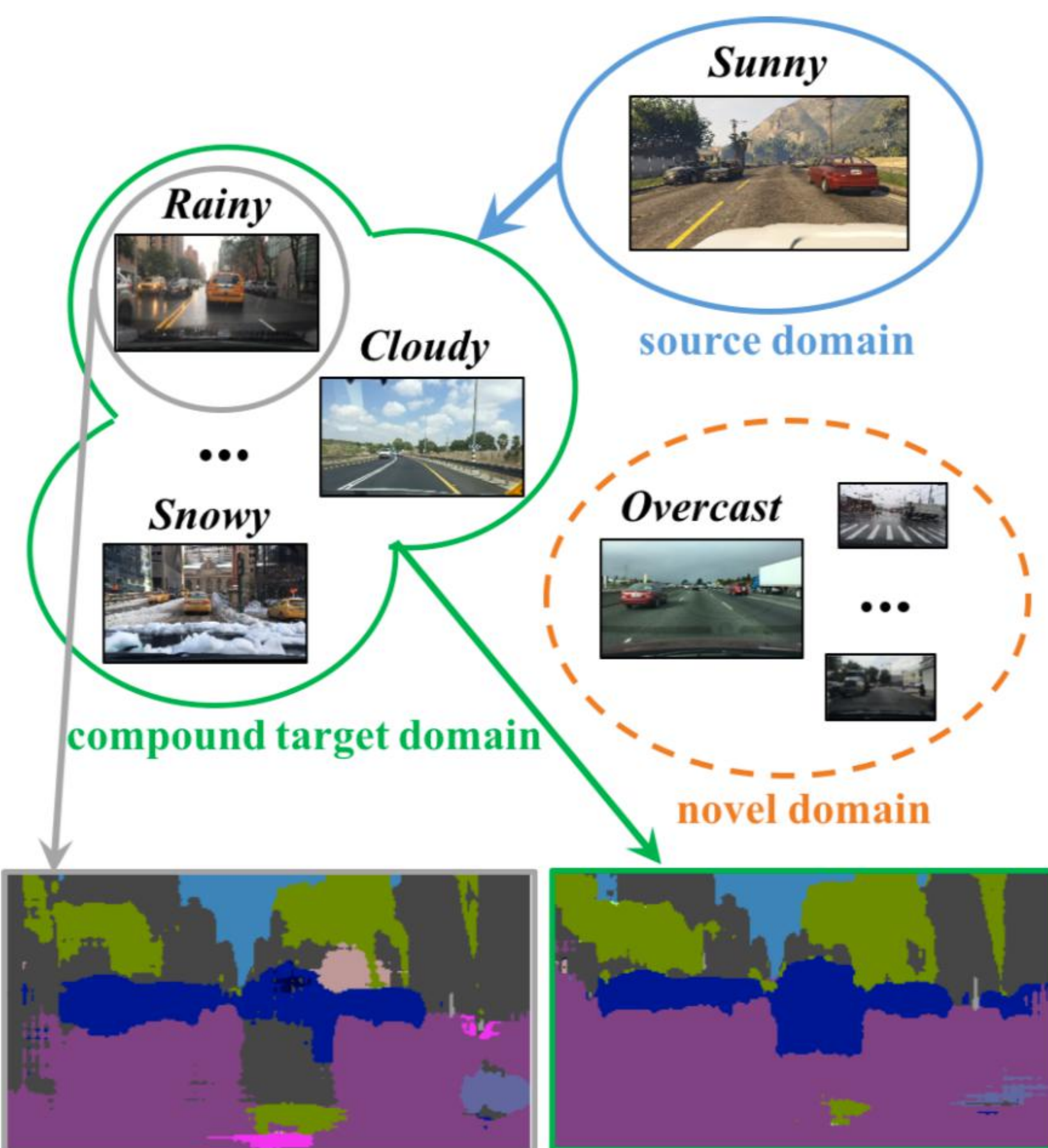




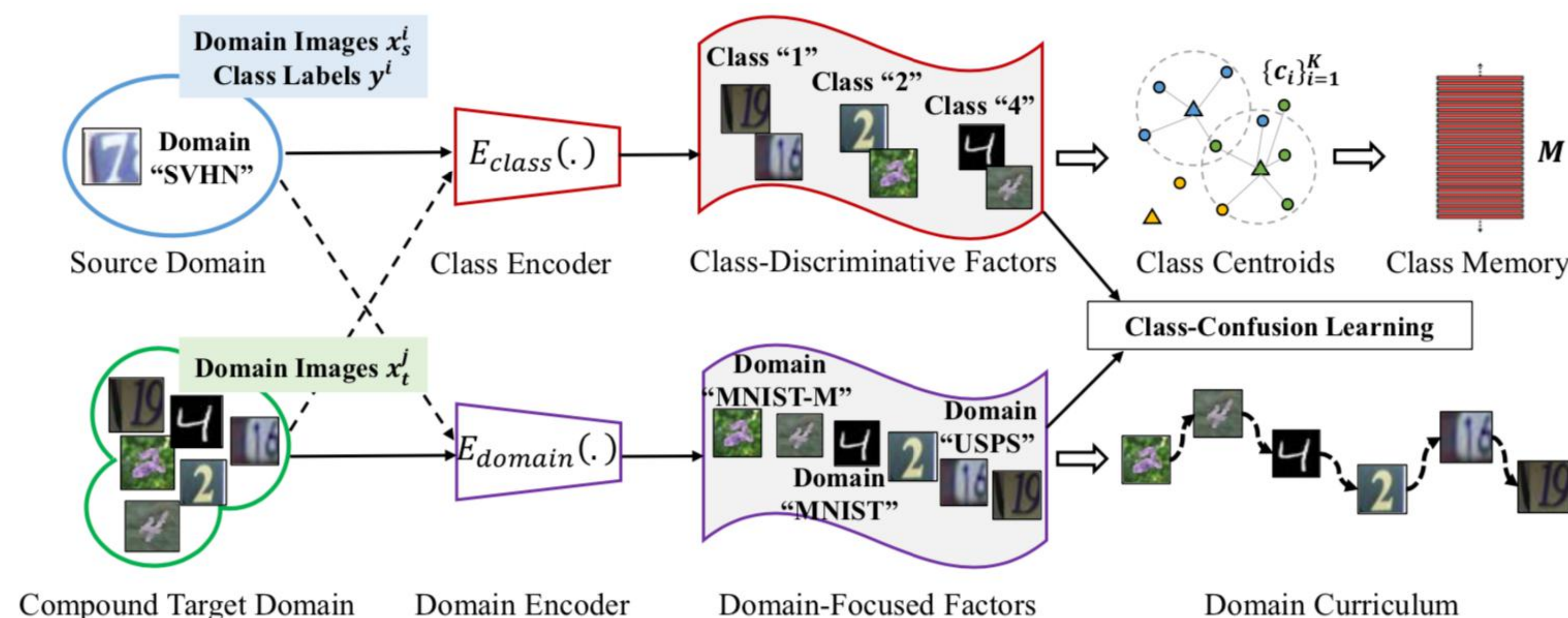
Open Compound Domain Adaptation

Ziwei Liu*, Zhongqi Miao*, Xingang Pan, Xiaohang Zhan, Dahua Lin, Stella X. Yu, Boqing Gong
The Chinese University of Hong Kong & UC Berkeley / ICSI & Google Inc.

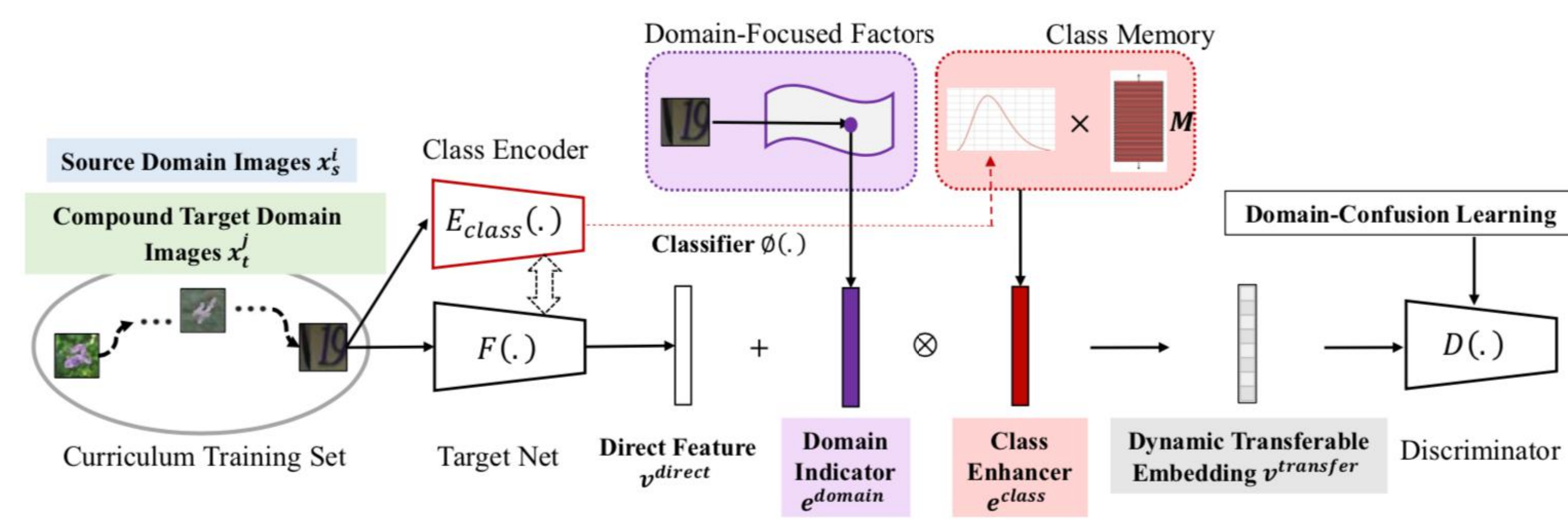
Open Compound Domain Adaptation



Instance-wise Curriculum for Compound Domains



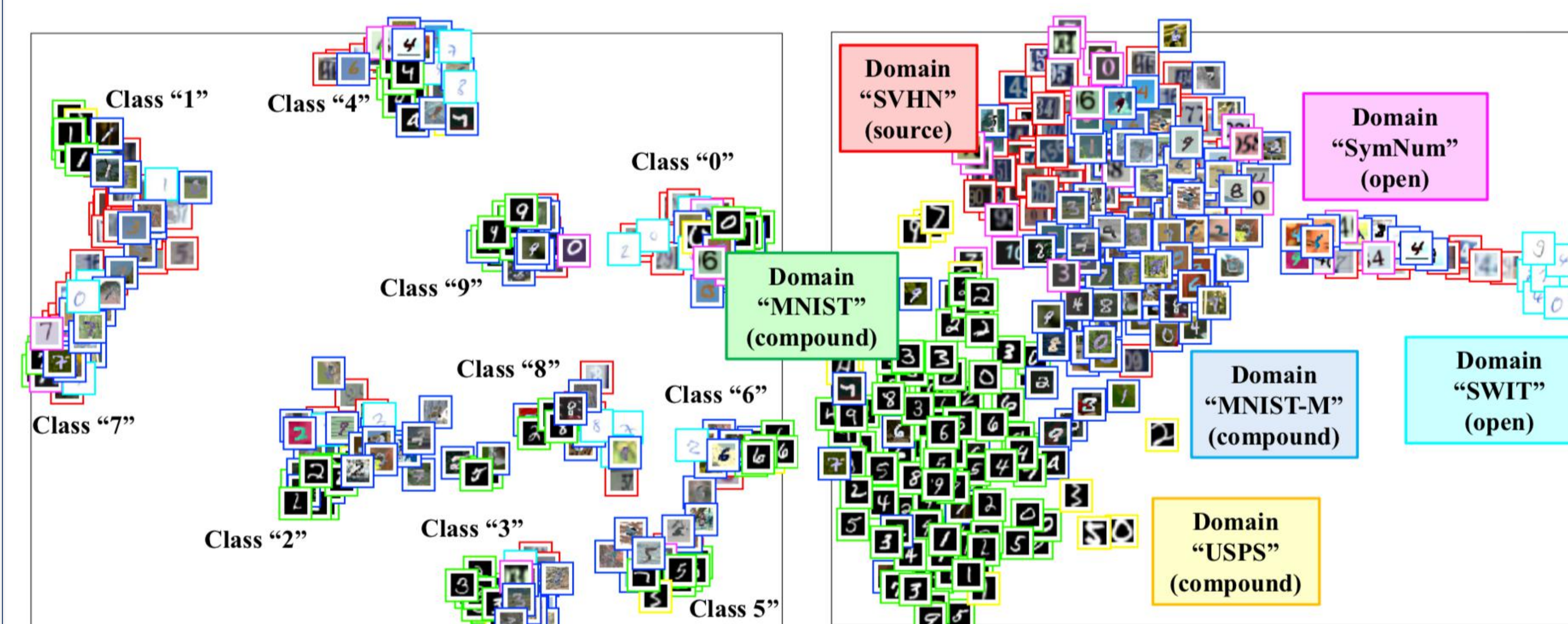
Domain Memory for Open Domains



Relation to Existing Tasks

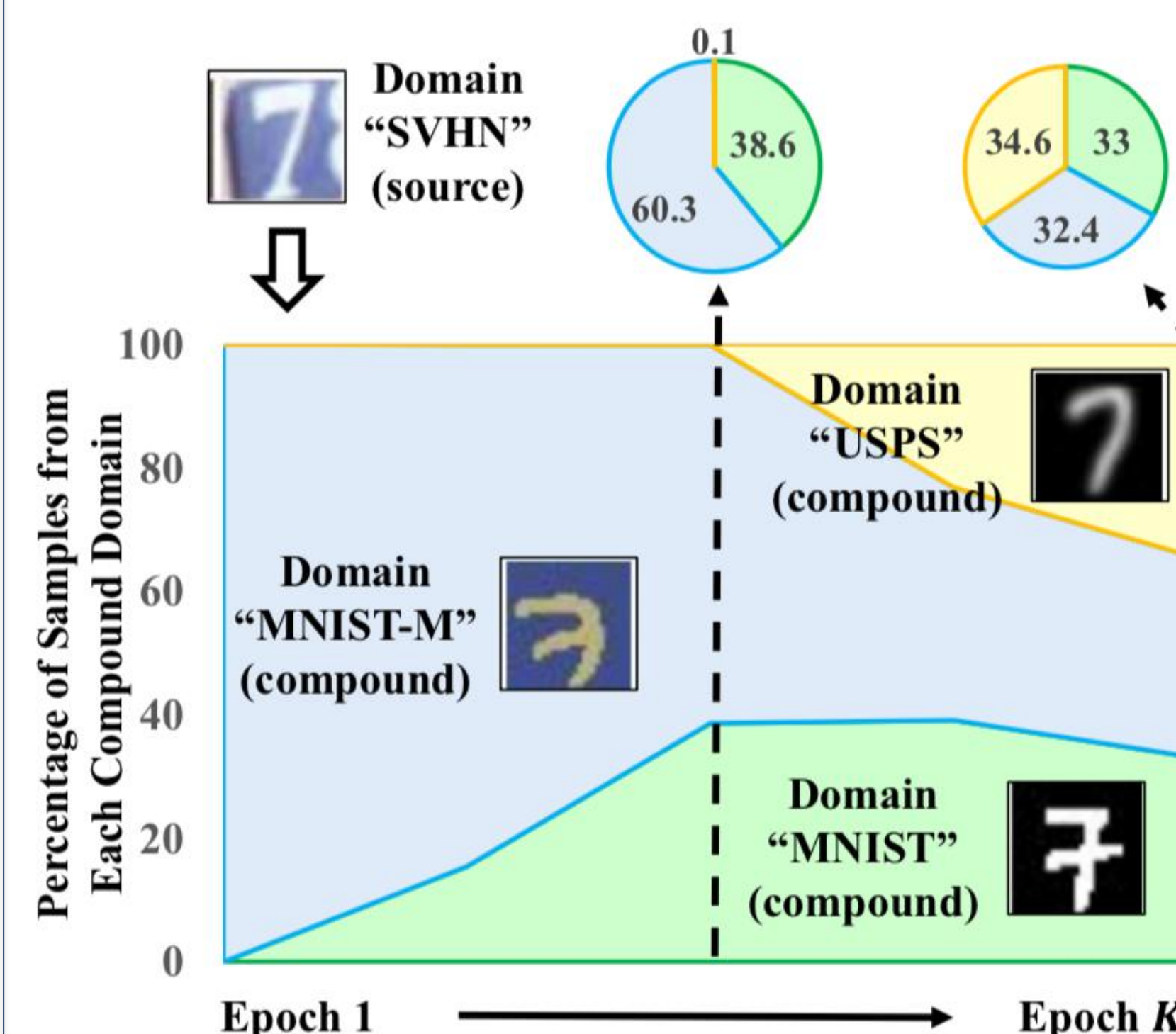
Domain Adaptation Setting	# Target Domains	Domain Labels	Open Classes	Open Domains
Unsupervised Domain Adaptation	single	known	×	×
Multi-Target Domain Adaptation	multiple	known	×	×
Open/Partial Set Domain Adaptation	single	known	✓	×
Open Compound Domain Adaptation	multiple	unknown	×	✓

Visualizations

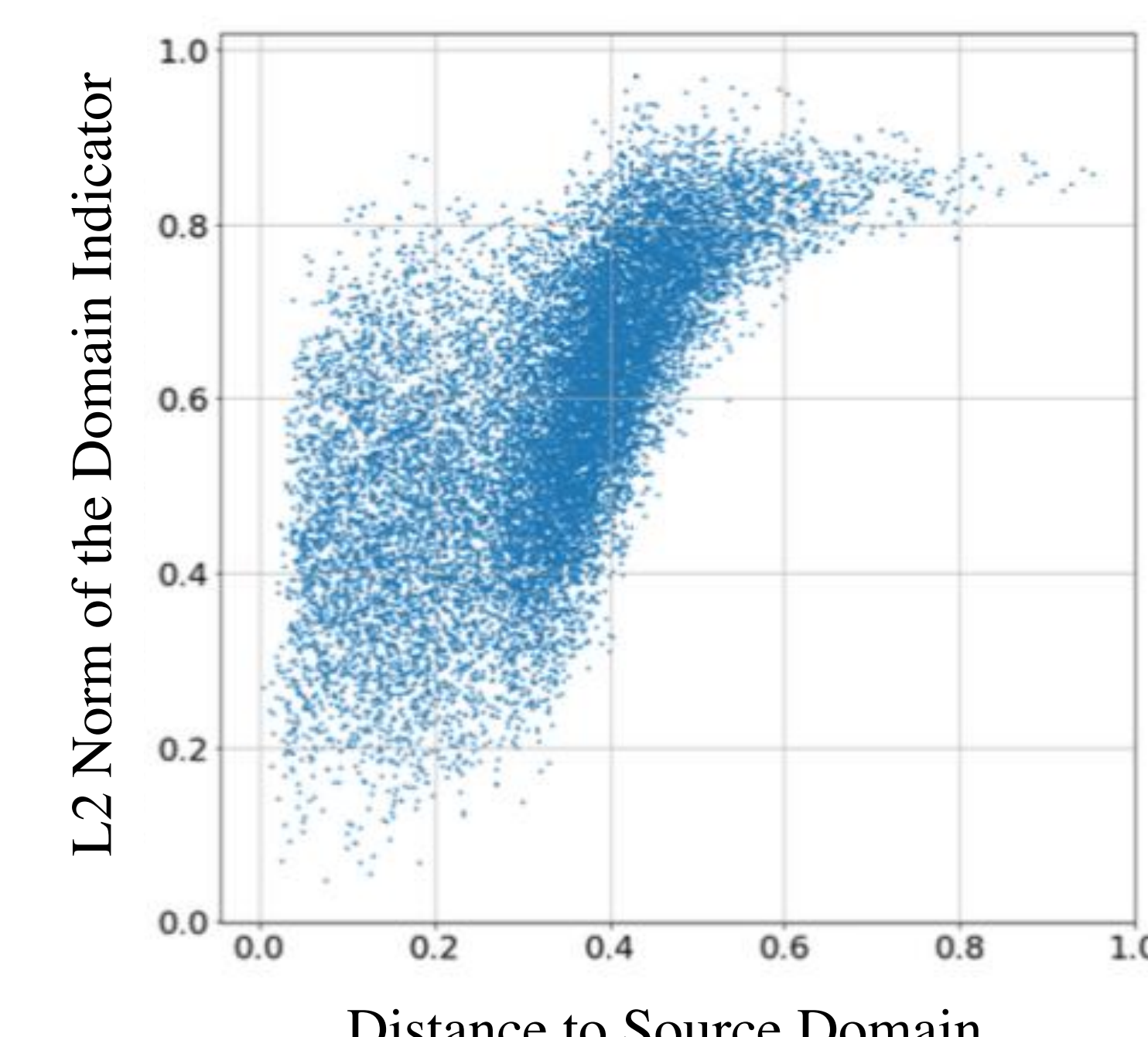


(a) The learned class discriminative factors

(b) The learned domain-focused factors

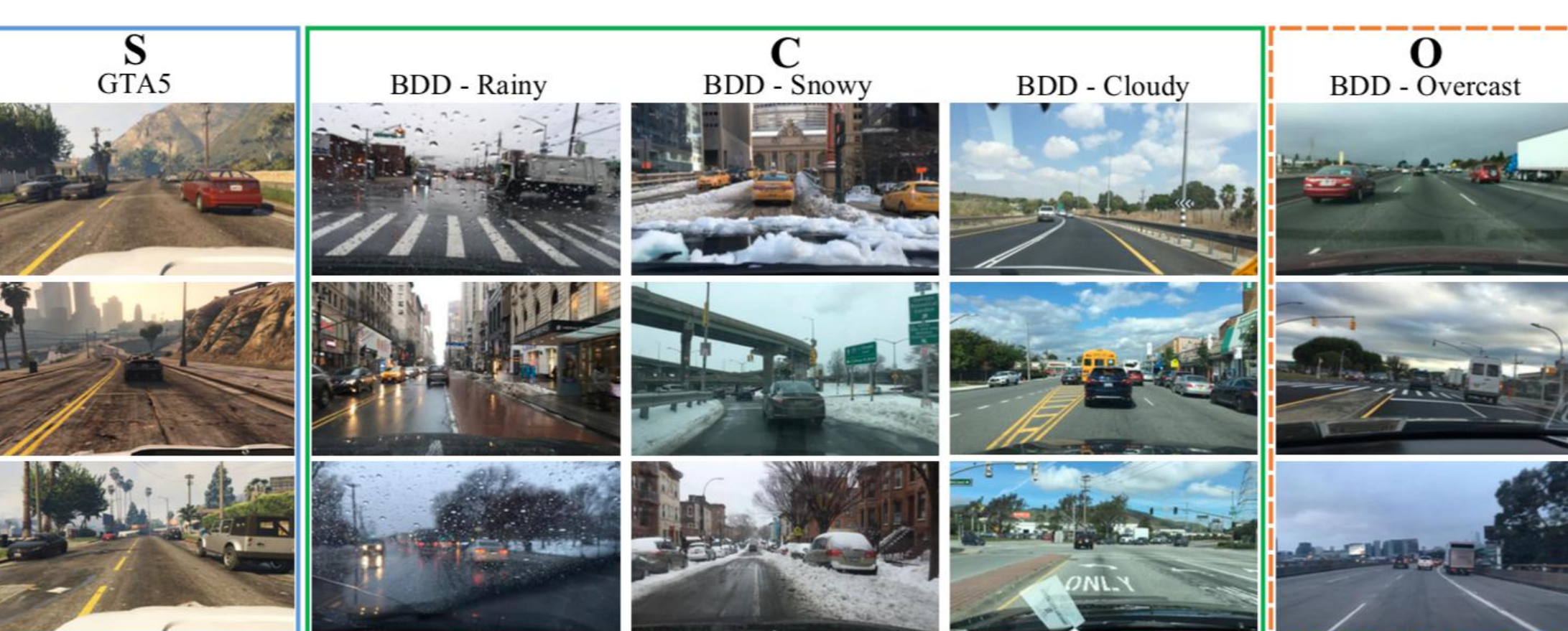
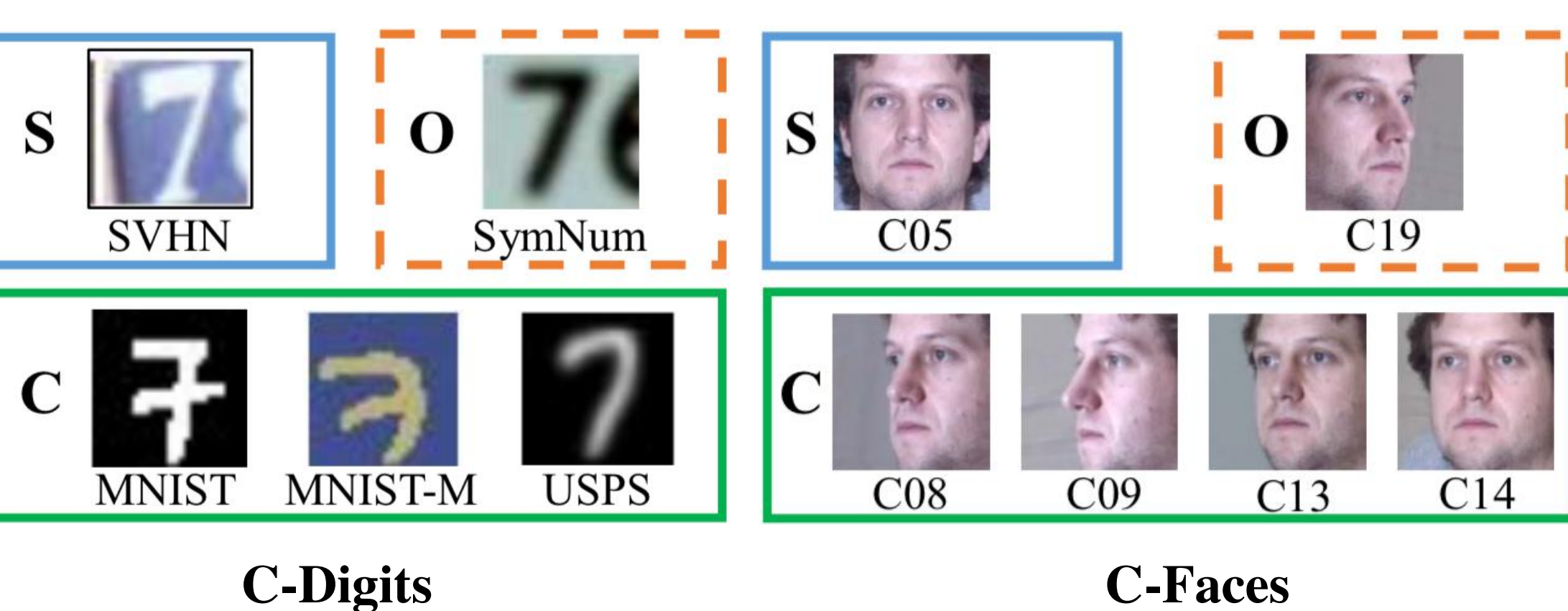


(c) The learned curriculum along epochs

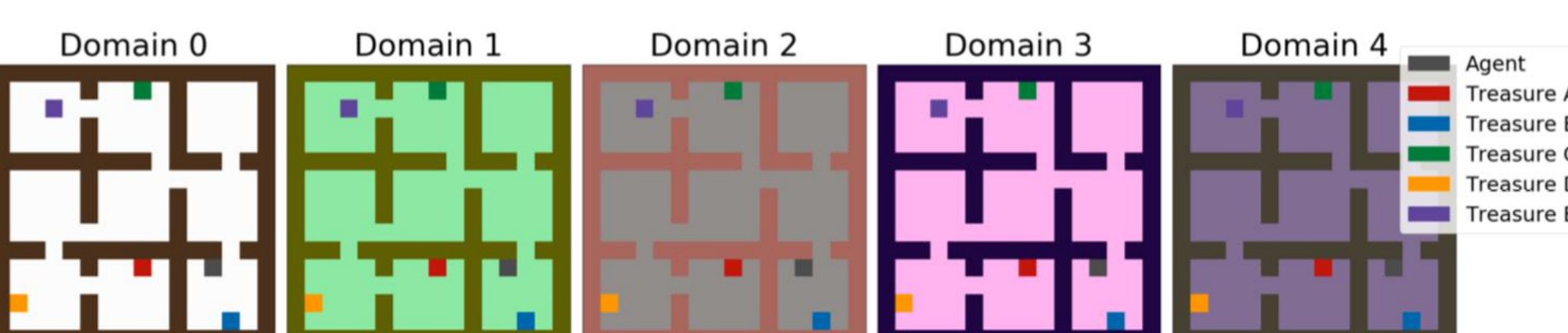


(d) The learned domain indicator

Benchmarks

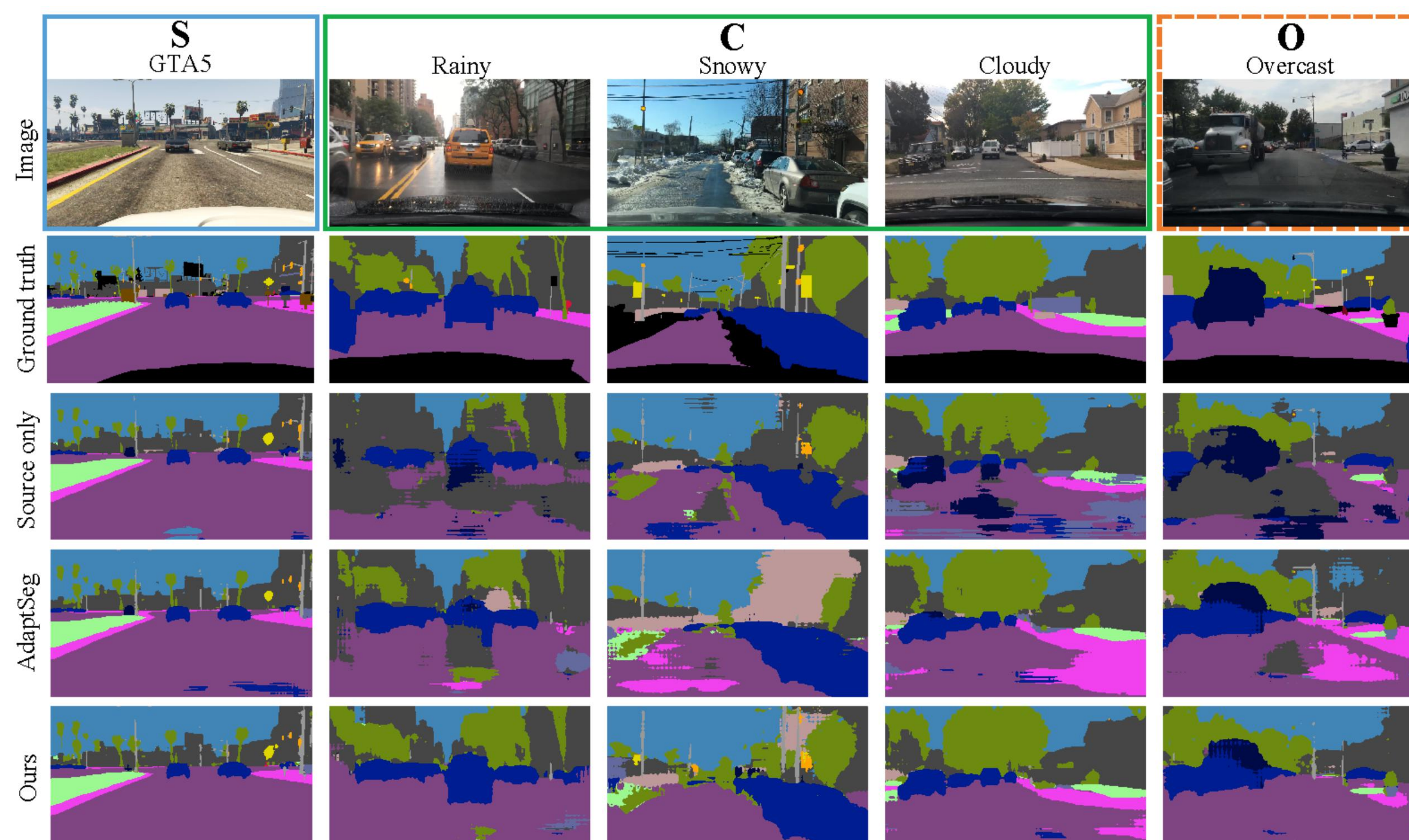


C-Driving



C-Mazes

Experimental Results



Source	Compound (C)			Open (O)	Avg.	
GTA-5 →	Rainy	Snowy	Cloudy	Overcast	C	C+O
Source Only	16.2	18.0	20.9	21.2	18.9	19.1
AdaptSeg [47]	20.2	21.2	23.8	25.1	22.1	22.5
CBST [58]	21.3	20.6	23.9	24.7	22.2	22.6
IBN-Net [35]	20.6	21.9	26.1	25.5	22.8	23.5
PyCDA [26]	21.7	22.3	25.9	25.4	23.3	23.8
Ours	22.0	22.9	27.0	27.9	24.5	25.0

C-Driving

Source	Open(O)				Avg.
M0 →	M1	M2	M3	M4	O
Source Only	0±0	0±0	0±0	0±0	0±0
MTL	0±0	30±5	75±0	65±5	42.5±2.5
MLP [18]	5±5	45±10	75±5	80±10	51.2±7.5
SynPo [18]	5±5	30±20	80±5	30±5	36.3±8.8
SynPo+Aug.	0±5	40±10	95±5	45±5	45.0±6.3
Ours	80±2.5	75±10	85±5	90±5	82.5±5.6

C-Mazes

Conclusions

New Task Open Compound Domain Adaptation

New Approach Curriculum + Memory **New Benchmarks** C-Digits/Faces/Driving/Mazes