

Supplementary Material: CLIP the Gap: A Single Domain Generalization Approach for Object Detection

Vidit Vidit¹ Martin Engilberge¹ Mathieu Salzmann^{1,2}
CVLab, EPFL¹, ClearSpace SA²
firstname.lastname@epfl.ch

A.1. Prompt Curation

As mentioned in our main paper, we curate a set of domain prompts \mathcal{P}^t . For this step, we get the words matching the concept *weather* from WordNet [4]. Tab. A.2 lists the hyponyms for the word *weather*. With this list, we filter out words that have cosine distance below 0.5 w.r.t the *weather* in CLIP embedding space. We further improve our wordlist using GloVe [3] to weed out the uncommon words. To this end, we take only the words which are in the 10k most common words of GloVe. Tab. A.1 lists the words after this stage.

draft , easter , elements , depression , wave , quiet , snow , sunshine , fog , blast , freeze , breath , wind , atmosphere , rainfall , warming , trade , blow , calm , cyclone , rain , air , low , high

Table A.1. Word list after CLIP and GloVe [3] based pruning

We still see there are words that show the same concepts like *draft* , *easter* , *elements* , *depression* , *air* , *low* , *high* , *wind* , *atmosphere* , *air* represent related to the windy or stormy conditions, hence we replace these words with *stormy*. We merge *rainfall* and *rain*, while removing ambiguous words like *blast*, *warming*, *breath*, *quiet*.

A.2. Additional Dataset

We evaluate our approach on (a) Comic and (b) Watercolor [2] while training on VOC [1]. We chose to omit clipart as it has additional categories, while comic and watercolor share the same 6 categories. Our approach on (a) w/-aug. achieves mAP 33.5 vs w/o-aug 32.8, and on (b) w/-aug. mAP 43.4 vs w/o-aug. 42.7. The detector with just CLIP-init attains mAP of 26.2 and 41.9 on (a) and (b), respectively.

For the above experiments, we used the prompts \mathcal{P}^t : “*an image in {comic, painting, cartoon, digital-art, sketch, wa-*

tercolor, oil painting} style” and the source prompt p^s “*a realistic image*”.

A.3. Additional Experiments

The prompts used for the Clip-Random experiment (Sec. 4.5 in the main paper) are arbitrary. For completeness, we give the results of clip-random with another set of prompts: *an image of a cat, an image taken in front of a museum, a picasso painting, an image of the sky* and achieve similar results as in Tab. 7: 51.2(Day), 36.0(Night), 30.4(DuskRainy), 15.1(NightRainy), 37.7(Foggy). We expect similar results for any set of words unrelated to the target domain.

References

- [1] M. Everingham, L. Van Gool, C. K. I. Williams, J. Winn, and A. Zisserman. The PASCAL Visual Object Classes Challenge 2012 (VOC2012) Results. <http://www.pascal-network.org/challenges/VOC/voc2012/workshop/index.html>. 1
- [2] Naoto Inoue, Ryosuke Furuta, Toshihiko Yamasaki, and Kiyoharu Aizawa. Cross-domain weakly-supervised object detection through progressive domain adaptation. In *Proceedings of the IEEE conference on computer vision and pattern recognition*, pages 5001–5009, 2018. 1
- [3] Jeffrey Pennington, Richard Socher, and Christopher D Manning. Glove: Global vectors for word representation. In *Proceedings of the 2014 conference on empirical methods in natural language processing (EMNLP)*, pages 1532–1543, 2014. 1
- [4] Princeton University. About wordnet. <https://wordnet.princeton.edu>, 2010. 1, 2

scattering , current of air , draft , norther , line storm , doldrums , flurry
 roughness , sou'wester , shower , gale , simoon , trade wind , boisterousness
 deluge , air mass , southerly , easter , west wind , mizzle , whiff
 cold wave , downfall , murk , line squall , elements , bad weather , easterly
 sprinkling , balminess , depression , monsoon , cloudburst , chinook wind , good weather
 fine spray , harmattan , clemency , tramontane , south wind , gentle breeze , wave
 tramontana , draught , windlessness , equinoctial storm , fohn , overcast , cloud cover
 quiet , moderate breeze , souther , thundershower , foehn , westerly , stillness
 airstream , north wind , whiteout , snow eater , levanter , catabatic wind , clear-air turbulence
 fair weather , snow , antitrades , simoom , bize , windiness , fresh gale
 drizzle , sunshine , fog , puff of air , bluster , heat wave , light air
 blast , zephyr , whole gale , temperateness , thawing , calmness , squall
 storminess , prevailing westerly , soaker , snowfall , hot weather , scorcher , fresh breeze
 raw weather , puff , rough water , northwest wind , murkiness , cold weather , gentle wind
 northwester , freeze , crosswind , gust , mildness , breath , near gale
 east wind , wind , northerly , rainstorm , chinook , atmosphere , rain shower
 rainfall , high wind , pelter , snow flurry , southeaster , virga , jet stream
 breeze , softness , warming , khamsin , atmospheric state , downpour , downdraft
 cloudiness , trade , blow , inclementness , antitrade , strong gale , antitrade wind
 calm , light breeze , tempestuousness , wester , lull , thaw , choppiness
 cyclone , calm air , sleet , sandblast , sea breeze , mistral , air current
 hail , southwester , rain , waterspout , sultriness , katabatic wind , torrent
 precipitation , headwind , moderate gale , boreas , breeziness , tailwind , air
 sou'easter , low , anticyclone , samiel , thermal , strong breeze , Santa Ana
 bise , frost , high , sprinkle , inclemency , turbulence , fogginess

Table A.2. Hyponyms of word *weather* in WordNet [4]