ELEVATER: A Benchmark and Toolkit for Evaluating Language-Augmented Visual Models

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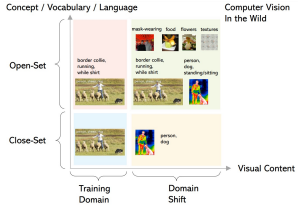
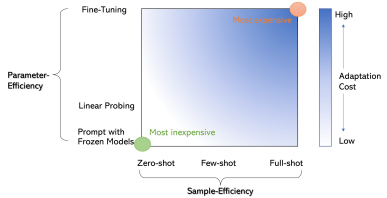
What is Computer Vision in the Wild (CVinW)?

Developing a transferable system that can adapt to *a large range of visual tasks* in the wild *effortlessly*.

1 The task transfer scenarios are broad

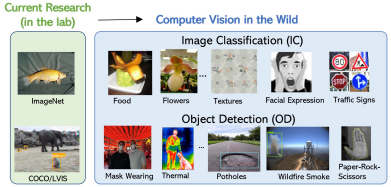


2 The task transfer cost is low.



Why ELEVATER?

A starting point of CVinW,
Evaluation of task-level visual transfer



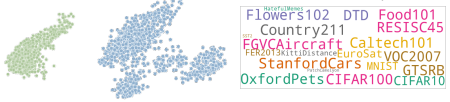
Fairness: Customized evaluation sets may favor individual model

Transparency: Detailed model adaptation process is inaccessible

Benchmark

ImageNet → Image Classification in the Wild (ICinW): **20** datasets

1151 classes: train 638K / eval 193K



LVIS → Object Detection in the Wild (ODinW): **35** datasets

314 classes: train 132K / eval 20K

External Knowledge

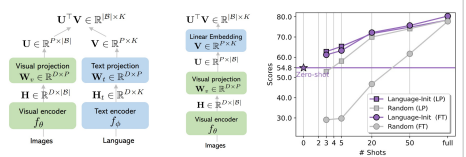
Concept name: risotto

- Def_wiki: An Italian savoury dish made with rice and other ingredients
- Def_wn: rice cooked with broth and sprinkled with grated cheese
- Path_wn: [risotto, dish, nutriment, food, substance, matter, physical_entity, entity]
- GPT3: A rice dish made with arborio rice and typically served with meat or fish

Toolkits

Automatic Hyper-parameter Tuning: learning rate and weight decay

Adaptation Pipeline: Language-augmented fine-tuning and linear probing

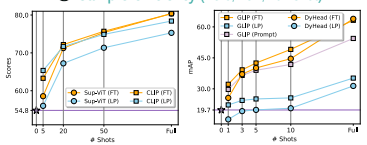


CLIP zero-shot

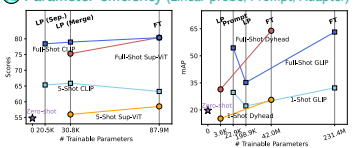
Language-Init Adaptation

Playgrounds

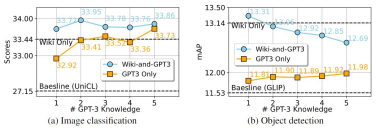
1 Sample-efficiency (Zero, Few, Full-shot)



2 Parameter-efficiency (Linear probe, Prompt, Adapter)



3 External Knowledge



(a) Image classification (b) Object detection

CVinW

Computer Vision in the Wild

https://computer-vision-in-the-wild.github.io

Challenge & Leaderboards

ICinW — Image Classification in the Wild

ODinW — Object Detection in the Wild

Benchmark Website
https://computer-vision-in-the-wild.github.io/ELEVATER/

ECCV Workshop
https://computer-vision-in-the-wild.github.io/eccv-2022/

Reading List for Beginners
https://github.com/Computer-Vision-in-the-Wild/CVinW_Readings

Call for Collaboration

- Benchmarking the transfer ability of SoTA vision models
- Contributors with valid submissions are encouraged for co-authorship