Towards Detecting, Augmenting, and Sampling, Efficient Datapoints for Robust Out-of-Distribution Generalization

Atharva Kulkarni, Raghav Kapoor, Anubha Kabra

(Details of Code Structure and Steps to run the code)

Paper Reference

- Arxiv: https://arxiv.org/abs/2109.06827
- Official: https://aclanthology.org/2021.emnlp-main.835/

Github Repository Link

Our repository **(Use this for reproducibility)** - https://github.com/anubhakabra/OOD-Generalization
Base/Reference Repository by Authors - https://github.com/uditarora/ood-text-emnlp

Environment Setup

After checking out our repository, please use the .yml file to set up the new environment before running the experiments. We used python version 3.10.

Files

- `roberta_fine_tune.py` is used to finetune the Roberta models.
- `msp_eval.py` are used to find the MSPs of a dataset pair's examples using the finetuned model.

How to run

These steps show how to train calibration models on the SST2 dataset, and evaluated against IMDB.

A different dataset pair can be used by updating the appropriate `dataset_name` or `id_data`/`ood_data` values as shown below:

Training the Calibration Model (RoBERTa)

(Using HF Datasets)

```
id_data="sst2"
nohup python -u roberta_fine_tune.py  --batch_size 16 --fname roberta_sst2 --output_dir roberta_ckpts_sst2/ --task_name sst2 > roberta_sst2
```

Finding Maximum Softmax Probability (MSP)

(Using HF Datasets)

```
id_data="sst2"
ood_data="imdb"
python msp_eval.py --model_path roberta_ckpts/roberta-$id_data --dataset_name $ood_data --fname ${id_data}_$ood_data
```

Evaluating AUROC

(Compute AUROC of MSP)

```
import utils
id_data = 'sst2'
ood_data = 'imdb'
id_msp = utils.read_model_out(f'output/roberta/roberta_{id_data}_msp.npy')
ood_msp = utils.read_model_out(f'output/msp/{id_data}_{ood_data}_msp.npy')
score = utils.compute_auroc(-id_msp, -ood_msp)
```