

# AG News (AG's News Corpus)

Introduced by Zhang et al. in [Character-level Convolutional Networks for Text Classification](#)

AG News (AG's News Corpus) is a subdataset of AG's corpus of news articles constructed by assembling titles and description fields of articles from the 4 largest classes ("World", "Sports", "Business", "Sci/Tech") of AG's Corpus. The AG News contains 30,000 training and 1,900 test samples per class.

Table 1: **Comparison** of our CPT with other counterparts for black-box LLM tuning on six natural language datasets. We treat LLAMA2-7B as the small white-box model and treat LLAMA2-13B as the large black-box model. "pretrained" represents the zero-shot inference by their official pretrained parameters. "LORA-tuned" represents directly fine-tuning the corresponding model with LORA. Proxy-tuning [1] and CPT represent using a 7B model to "proxy fine-tune" a 13B model, where the 7B model is trained using their method and our method, respectively. "ARC-C" is the abbreviation of ARC-challenge.

Model	Accuracy (%) ↑						Mean Acc (%) ↑
	TriviaQA	ARC-C.	commonsenseQA	COLA	MRPC	AG-News	
LLAMA2-7B							
pretrained	21.88	43.14	33.74	45.73	32.04	41.14	36.27
LORA-tuned	60.03	47.16	75.84	81.50	68.99	90.21	70.62
LLAMA2-13B							
pretrained	36.76	53.85	35.71	70.95	67.96	64.15	54.89
Proxy-tuning [1]	61.52	50.17	74.04	79.19	68.22	90.34	70.58
CPT (Ours)	62.79	55.85	76.41	82.26	69.77	90.91	72.99
LORA-tuned	66.58	66.22	81.90	84.65	68.99	90.65	76.49

7b pretrain acc: 0.4358

```
root@e8e99ab71e21: ~  
Probabilities for choices: {'A': 0.346435546875, 'B': 0.2021484375, 'C': 0.30810546875, 'D': 0.143310546875}  
Predicted Answer: A, True Answer: A  
Evaluating: 100%|#####| 7592/7600 [42:19<00:02, 2.79it/s]  
Probabilities for choices: {'A': 0.3232421875, 'B': 0.245849609375, 'C': 0.28515625, 'D': 0.1456298828125}  
Predicted Answer: A, True Answer: A  
Evaluating: 100%|#####| 7593/7600 [42:19<00:02, 2.95it/s]  
Probabilities for choices: {'A': 0.306396484375, 'B': 0.318603515625, 'C': 0.258056640625, 'D': 0.1171875}  
Predicted Answer: B, True Answer: B  
Evaluating: 100%|#####| 7594/7600 [42:19<00:02, 2.96it/s]  
Probabilities for choices: {'A': 0.299560546875, 'B': 0.20751953125, 'C': 0.306640625, 'D': 0.18603515625}  
Predicted Answer: C, True Answer: A  
Evaluating: 100%|#####| 7595/7600 [42:20<00:01, 2.95it/s]  
Probabilities for choices: {'A': 0.283447265625, 'B': 0.1541748046875, 'C': 0.32373046875, 'D': 0.2386474609375}  
Predicted Answer: C, True Answer: A  
Evaluating: 100%|#####| 7596/7600 [42:20<00:01, 3.07it/s]  
Probabilities for choices: {'A': 0.328369140625, 'B': 0.2420654296875, 'C': 0.272216796875, 'D': 0.157470703125}  
Predicted Answer: A, True Answer: B  
Evaluating: 100%|#####| 7597/7600 [42:20<00:01, 2.84it/s]  
Probabilities for choices: {'A': 0.315185546875, 'B': 0.232421875, 'C': 0.284912109375, 'D': 0.16748046875}  
Predicted Answer: A, True Answer: B  
Evaluating: 100%|#####| 7598/7600 [42:21<00:00, 2.99it/s]  
Probabilities for choices: {'A': 0.29443359375, 'B': 0.16259765625, 'C': 0.32080078125, 'D': 0.22216796875}  
Predicted Answer: C, True Answer: C  
Evaluating: 100%|#####| 7599/7600 [42:21<00:00, 2.95it/s]  
Probabilities for choices: {'A': 0.260498046875, 'B': 0.25244140625, 'C': 0.279541015625, 'D': 0.2076416015625}  
Predicted Answer: C, True Answer: C  
Evaluating: 100%|#####| 7600/7600 [42:21<00:00, 2.99it/s]  
Evaluation completed. Accuracy: 0.4358 (3312/7600)  
Logits saved!  
(base) root@e8e99ab71e21:~/Workspace/SF_CPT/AG_NEWS#
```

13b pretrain acc: **0.7618**

```
root@e8e99ab71e21: ~/Workspace/SF_CPT/AG_NEWS#
Probabilities for choices: {'A': 0.353759765625, 'B': 0.198486328125, 'C': 0.2064208984375, 'D': 0.2413330078125}
Predicted Answer: A, True Answer: A
Evaluating: 100%|#####| 7592/7600 [1:22:59<00:05, 1.46it/s]
Probabilities for choices: {'A': 0.26708984375, 'B': 0.19384765625, 'C': 0.2548828125, 'D': 0.2841796875}
Predicted Answer: D, True Answer: A
Evaluating: 100%|#####| 7593/7600 [1:22:59<00:04, 1.54it/s]
Probabilities for choices: {'A': 0.13134765625, 'B': 0.56640625, 'C': 0.1387939453125, 'D': 0.16357421875}
Predicted Answer: B, True Answer: B
Evaluating: 100%|#####| 7594/7600 [1:23:00<00:03, 1.51it/s]
Probabilities for choices: {'A': 0.341796875, 'B': 0.190185546875, 'C': 0.2276611328125, 'D': 0.240478515625}
Predicted Answer: A, True Answer: A
Evaluating: 100%|#####| 7595/7600 [1:23:01<00:03, 1.49it/s]
Probabilities for choices: {'A': 0.2049560546875, 'B': 0.179443359375, 'C': 0.241455078125, 'D': 0.3740234375}
Predicted Answer: D, True Answer: A
Evaluating: 100%|#####| 7596/7600 [1:23:01<00:02, 1.56it/s]
Probabilities for choices: {'A': 0.2469482421875, 'B': 0.32958984375, 'C': 0.1968994140625, 'D': 0.2265625}
Predicted Answer: B, True Answer: B
Evaluating: 100%|#####| 7597/7600 [1:23:02<00:02, 1.47it/s]
Probabilities for choices: {'A': 0.2064208984375, 'B': 0.356689453125, 'C': 0.203125, 'D': 0.23388671875}
Predicted Answer: B, True Answer: B
Evaluating: 100%|#####| 7598/7600 [1:23:03<00:01, 1.55it/s]
Probabilities for choices: {'A': 0.2142333984375, 'B': 0.2027587890625, 'C': 0.25634765625, 'D': 0.32666015625}
Predicted Answer: D, True Answer: C
Evaluating: 100%|#####| 7599/7600 [1:23:03<00:00, 1.53it/s]
Probabilities for choices: {'A': 0.0889892578125, 'B': 0.2069091796875, 'C': 0.427978515625, 'D': 0.2763671875}
Predicted Answer: C, True Answer: C
Evaluating: 100%|#####| 7600/7600 [1:23:04<00:00, 1.52it/s]
Evaluation completed. Accuracy: 0.7618 (5790/7600)
Logits saved!
No other window. b71e21:~/Workspace/SF_CPT/AG_NEWS#
```

7b lora-tune acc: **0.8861**

```
root@e8e99ab71e21: ~/Workspace/SF_CPT/AG_NEWS#
Probabilities for choices: {'A': 0.951171875, 'B': 0.0028667449951171875, 'C': 0.04083251953125, 'D': 0.00527191162109375}
Predicted Answer: A, True Answer: A
Evaluating: 100%|#####| 7593/7600 [42:13<00:02, 2.96it/s]
Probabilities for choices: {'A': 0.0183868408203125, 'B': 0.98046875, 'C': 0.00103759765625, 'D': 0.0001010894775390625}
Predicted Answer: B, True Answer: B
Evaluating: 100%|#####| 7594/7600 [42:13<00:02, 2.94it/s]
Probabilities for choices: {'A': 0.962890625, 'B': 0.002010345458984375, 'C': 0.028411865234375, 'D': 0.006488800048828125}
Predicted Answer: A, True Answer: A
Evaluating: 100%|#####| 7595/7600 [42:14<00:01, 2.92it/s]
Probabilities for choices: {'A': 0.796875, 'B': 0.0026378631591796875, 'C': 0.0701904296875, 'D': 0.130126953125}
Predicted Answer: A, True Answer: A
Evaluating: 100%|#####| 7596/7600 [42:14<00:01, 3.06it/s]
Probabilities for choices: {'A': 0.045379638671875, 'B': 0.92578125, 'C': 0.0286102294921875, 'D': 0.0003178119659423828}
Predicted Answer: B, True Answer: B
Evaluating: 100%|#####| 7597/7600 [42:14<00:01, 2.87it/s]
Probabilities for choices: {'A': 0.11419677734375, 'B': 0.83740234375, 'C': 0.047607421875, 'D': 0.00089263916015625}
Predicted Answer: B, True Answer: B
Evaluating: 100%|#####| 7598/7600 [42:15<00:00, 3.03it/s]
Probabilities for choices: {'A': 0.45556640625, 'B': 0.0009889602661132812, 'C': 0.058380126953125, 'D': 0.485107421875}
Predicted Answer: D, True Answer: C
Evaluating: 100%|#####| 7599/7600 [42:15<00:00, 2.99it/s]
Probabilities for choices: {'A': 0.138427734375, 'B': 0.0034122467041015625, 'C': 0.38232421875, 'D': 0.475830078125}
Predicted Answer: D, True Answer: C
Evaluating: 100%|#####| 7600/7600 [42:15<00:00, 3.00it/s]
Evaluation completed. Accuracy: 0.8816 (6700/7600)
Logits saved!
(base) root@e8e99ab71e21:~/Workspace/SF_CPT/AG_NEWS#
```

13b lora-tune acc: **0.8993**

```
Evaluating: 100%|██████████| 7594/7600 [1:31:10<00:04, 1.38it/s]
Probabilities for choices: {'A': 0.1617431640625, 'B': 0.77783203125, 'C': 0.039642333984375, 'D': 0.0
208892822265625}
Predicted Answer: B, True Answer: B
Evaluating: 100%|██████████| 7595/7600 [1:31:11<00:03, 1.37it/s]
Probabilities for choices: {'A': 0.77734375, 'B': 0.030609130859375, 'C': 0.10357666015625, 'D': 0.088
56201171875}
Predicted Answer: A, True Answer: A
Evaluating: 100%|██████████| 7596/7600 [1:31:12<00:02, 1.44it/s]
Probabilities for choices: {'A': 0.5244140625, 'B': 0.06414794921875, 'C': 0.1434326171875, 'D': 0.267
822265625}
Predicted Answer: A, True Answer: A
Evaluating: 100%|██████████| 7597/7600 [1:31:13<00:02, 1.34it/s]
Probabilities for choices: {'A': 0.1279296875, 'B': 0.69677734375, 'C': 0.0965576171875, 'D': 0.078796
38671875}
Predicted Answer: B, True Answer: B
Evaluating: 100%|██████████| 7598/7600 [1:31:13<00:01, 1.42it/s]
Probabilities for choices: {'A': 0.1156005859375, 'B': 0.81494140625, 'C': 0.05633544921875, 'D': 0.01
31683349609375}
Predicted Answer: B, True Answer: B
Evaluating: 100%|██████████| 7599/7600 [1:31:14<00:00, 1.39it/s]
Probabilities for choices: {'A': 0.28955078125, 'B': 0.04803466796875, 'C': 0.278564453125, 'D': 0.383
7890625}
Predicted Answer: D, True Answer: C
Evaluating: 100%|██████████| 7600/7600 [1:31:15<00:00, 1.39it/s]
Probabilities for choices: {'A': 0.1448974609375, 'B': 0.033599853515625, 'C': 0.546875, 'D': 0.274902
34375}
Predicted Answer: C, True Answer: C
Evaluation completed. Accuracy: 0.8993 (6835/7600)

Logits saved!
```

Proxy tuning acc: **0.8925**

```
root@e8e99ab71e21: ~
Probabilities for choices: {'A': 0.9739565849304199, 'B': 0.0038278535939753056, 'C': 0.017562074586749077, 'D': 0.00465
3486423194408}
Predicted Answer: A, True Answer: A
Probabilities for choices: {'A': 0.9412900805473328, 'B': 0.0027065882459282875, 'C': 0.04368211701512337, 'D': 0.012321
108020842075}
Predicted Answer: A, True Answer: A
Probabilities for choices: {'A': 0.004501475486904383, 'B': 0.9950994849205017, 'C': 0.00031853202381171286, 'D': 8.0537
50934777781e-05}
Predicted Answer: B, True Answer: B
Probabilities for choices: {'A': 0.9722832441329956, 'B': 0.001630720915272832, 'C': 0.01866261288523674, 'D': 0.0074234
73987728357}
Predicted Answer: A, True Answer: A
Probabilities for choices: {'A': 0.6896665096282959, 'B': 0.0036760291550308466, 'C': 0.06266297399997711, 'D': 0.243994
48931217194}
Predicted Answer: A, True Answer: A
Probabilities for choices: {'A': 0.025931671261787415, 'B': 0.9579925537109375, 'C': 0.015728352591395378, 'D': 0.000347
484543453902}
Predicted Answer: B, True Answer: B
Probabilities for choices: {'A': 0.05361637473106384, 'B': 0.9211331009864807, 'C': 0.024356335401535034, 'D': 0.0008941
377163864672}
Predicted Answer: B, True Answer: B
Probabilities for choices: {'A': 0.303509920835495, 'B': 0.0011293748393654823, 'C': 0.04271186515688896, 'D': 0.6526488
661766052}
Predicted Answer: D, True Answer: C
Probabilities for choices: {'A': 0.037294901907444, 'B': 0.002205009339377284, 'C': 0.46149981021881104, 'D': 0.49900028
109550476}
Predicted Answer: D, True Answer: C
Evaluating: 100%|██████████| 7600/7600 [00:04<00:00, 1653.49it/s]
Evaluation completed. Accuracy: 0.8925 (6783/7600)
(base) root@e8e99ab71e21:~/Workspace/SF_CPT/AG_NEWS#
```

Consistent proxy tuning acc: **0.9080**

```
root@e8e99ab71e21: ~  
Probabilities for choices: {'A': 0.9993137121200562, 'B': 4.466539394343272e-05, 'C': 0.00034587382106110454, 'D': 0.000  
29584154253825545}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.9974139928817749, 'B': 8.45988979563117e-05, 'C': 0.001646934892050922, 'D': 0.0008854  
4185548089445}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.004197773057967424, 'B': 0.9955587387084961, 'C': 0.00016532849986106157, 'D': 7.8095  
65431671217e-05}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.9991742968559265, 'B': 4.536244523478672e-05, 'C': 0.0005191456875763834, 'D': 0.0002  
6104284916073084}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.9896043539047241, 'B': 0.00015681401418987662, 'C': 0.0019404699560254812, 'D': 0.008  
298337459564209}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.003822020022198558, 'B': 0.99553382396698, 'C': 0.00047096528578549623, 'D': 0.000173  
25844964943826}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.0020178230479359627, 'B': 0.9973924160003662, 'C': 0.00045023721759207547, 'D': 0.000  
1394769933540374}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.5350063443183899, 'B': 0.001368244644254446, 'C': 0.0959213525056839, 'D': 0.36770412  
32585907}  
Predicted Answer: A, True Answer: C  
Probabilities for choices: {'A': 0.0011945303995162249, 'B': 7.173712219810113e-05, 'C': 0.19168974459171295, 'D': 0.807  
0439696311951}  
Predicted Answer: D, True Answer: C  
Evaluating: 100%|*****| 7600/7600 [00:04<00:00, 1682.37it/s]  
Evaluation completed. Accuracy: 0.9080 (6901/7600)  
(base) root@e8e99ab71e21:~/Workspace/SF_CPT/AG_NEWS#
```

GP tune acc: **0.9078**

1000/10000 (10%)

```
root@e8e99ab71e21: ~  
Probabilities for choices: {'A': 0.9994040727615356, 'B': 4.196304871584289e-05, 'C': 0.0003199099446646869, 'D': 0.0002  
340510836802423}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.998258650302887, 'B': 5.5528296798001975e-05, 'C': 0.0010980241931974888, 'D': 0.0005  
877300282008946}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.009265093132853508, 'B': 0.9904198050498962, 'C': 0.0002213254338130355, 'D': 9.37150  
907702744e-05}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.999187171459198, 'B': 4.066315523232334e-05, 'C': 0.0005191523814573884, 'D': 0.0002  
530146448407322}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.9920526742935181, 'B': 0.00010149722947971895, 'C': 0.0016638783272355795, 'D': 0.006  
182057783007622}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.005998073145747185, 'B': 0.9930819869041443, 'C': 0.0006522601470351219, 'D': 0.00026  
76870208233595}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.00388148776255548, 'B': 0.995349109172821, 'C': 0.0006141405319795012, 'D': 0.0001552  
7904906775802}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.6869848966598511, 'B': 0.0012458428973332047, 'C': 0.10869679600000381, 'D': 0.203072  
33929634094}  
Predicted Answer: A, True Answer: C  
Probabilities for choices: {'A': 0.002842683345079422, 'B': 0.00010851394472410902, 'C': 0.20885147154331207, 'D': 0.788  
1972789764404}  
Predicted Answer: D, True Answer: C  
Evaluating: 100%|*****| 7600/7600 [00:04<00:00, 1781.87it/s]  
Evaluation completed. Accuracy: 0.9078 (6899/7600)  
(base) root@e8e99ab71e21:~/Workspace/SF_CPT/AG_NEWS#
```

GP with filter acc: **0.9082**

Config: input\_threshold=0.119, output\_threshold=2

214/10000 (2.14%)

```
root@e8e99ab71e21: ~  
Probabilities for choices: {'A': 0.9995218515396118, 'B': 3.821229256573133e-05, 'C': 0.00021648738766089082, 'D': 0.00022335942776408046}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.9983450174331665, 'B': 4.977954813512042e-05, 'C': 0.000939271179959178, 'D': 0.000660429644398391}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.0041981893591582775, 'B': 0.9956574440002441, 'C': 8.989645721158013e-05, 'D': 5.452495679492131e-05}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.9993751645088196, 'B': 3.319454481243156e-05, 'C': 0.00036820341483689845, 'D': 0.00022332665685098618}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.9917239546775818, 'B': 0.00010970830771839246, 'C': 0.0013789464719593525, 'D': 0.006787412334233522}  
Predicted Answer: A, True Answer: A  
Probabilities for choices: {'A': 0.0037633052561432123, 'B': 0.9956766963005066, 'C': 0.0003726176801137626, 'D': 0.00018736392667051405}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.0021147874649614096, 'B': 0.9974523186683655, 'C': 0.000324313179589808, 'D': 0.0001086313059204258}  
Predicted Answer: B, True Answer: B  
Probabilities for choices: {'A': 0.5210063457489014, 'B': 0.0014407116686925292, 'C': 0.09637648612260818, 'D': 0.3811764121055603}  
Predicted Answer: A, True Answer: C  
Probabilities for choices: {'A': 0.0013083837693557143, 'B': 9.330959437647834e-05, 'C': 0.23059609532356262, 'D': 0.7680022120475769}  
Predicted Answer: D, True Answer: C  
Evaluating: 100%|#####| 7600/7600 [00:04<00:00, 1702.44it/s]  
Evaluation completed. Accuracy: 0.9082 (6902/7600)  
(base) root@e8e99ab71e21:~/Workspace/SF_CPT/AG_NEWS#
```