

Transfer Learning for Pose Estimation of Illustrated Characters

Supplementary Materials

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1. Tagger Classification Comparison

In the main paper, we show that our tagger (trained on our new tag rulebook with class-balanced weighing) significantly improves transfer to pose estimation. Here, we show classification results in comparison to the RF5 Danbooru tagger [2], a publicly-available model with the same ResNet50 architecture. RF5 predicts the presence of the top 6000 most common tags in the dataset; 1207 of these are present in our new rulebook, and can be used to predict 1032 of the 1062 total new classes. As we can see from Table 1 below, our model performs much better at classifying the same tags.

Model	Ours	RF5
F-2	0.4744	0.2297
precision	0.3022	0.1238
recall	0.5786	0.3360
accuracy	0.9760	0.9496
F-1	0.4249	0.1910
precision	0.4236	0.1898
recall	0.4458	0.2235
accuracy	0.9851	0.9727

Table 1. Comparison of our Danbooru tagger to RF5 [2]. Metrics are calculated using per-class optimal thresholds for either F-1 or F-2, and averaged across all classes shared between models. Note that this means F-1 and F-2 cannot be directly calculated from their respective precision and recall statistics in the table.

2. Pose Retrieval Additional Results

We display several more pose-based illustration retrieval results in Fig. 1; the images are taken from the Danbooru dataset [1]. The first two rows show challenging sitting positions, on which our model still performs well qualitatively. Despite the differences in orientation, our rotation-invariant descriptor is still able to identify the poses as similar. Rows 3-5 show some more standard poses. Notice that in row 4, the first and second neighbors are variations of the same character in the same pose; it is very common to find a set of such variations uploaded to Danbooru together, and our model may help identify them. In the last two rows, we show failure cases of our model, where incorrect predictions on the query result in neighbors with different poses.

We also provide artist attributions for the figures in the main paper and this supplementary document. Danbooru URLs are at <https://danbooru.donmai.us/posts/DANBOORU.ID>. Artist websites are tracked from the illustration’s Danbooru page to the best of our ability. Please note the links might not be SFW.

References

- [1] Anonymous, Danbooru community, and Gwern Branwen. Danbooru2020: A large-scale crowdsourced and tagged anime illustration dataset. <https://www.gwern.net/Danbooru2020>, January 2021.
- [2] Matthew Baas. Danbooru2018 pretrained resnet models for pytorch. <https://rf5.github.io>, July 2019.



Figure 1. Additional pose-based retrieval results. From left to right, we show the query image (descriptor distance zero) followed by its five nearest neighbors (duplicate and NSFW images removed). Each illustration is annotated with its Danbooru ID, descriptor distance to the query, and the predicted bounding box with COCO keypoints.

Row,Col	Danbooru ID	Artist Handle	Artist URL
0,0	2467866	露茶	https://www.pixiv.net/en/users/263905
0,1	3550832	Go-1	https://twitter.com/go_1tk
0,2	2686368	あれっくす	https://twitter.com/alexmaster55
0,3	2690117	クラモリ	https://www.pixiv.net/en/users/1209275
0,4	2924224	紅葉(くれは)@お仕事募集中	https://www.pixiv.net/en/users/6006540
0,5	3159104	みの字	https://www.pixiv.net/en/users/1523486
1,0	2407777	唯川	https://twitter.com/yUikw
1,1	3410315	楠本みや	https://www.pixiv.net/en/users/6211628
1,2	2939081	SeNMU	https://www.pixiv.net/en/users/65308
1,3	3561420	なもり@ゆるゆり20巻でた	https://twitter.com/_namori_
1,4	1698324	ratryu	https://www.pixiv.net/en/users/3892817
1,5	3671428	ほや野	https://www.pixiv.net/en/users/1263092
2,0	3314044	九条だんぼ	https://twitter.com/_Dan_ball
2,1	120497	劉祥	https://www.pixiv.net/en/users/22017
2,2	3669958	もやし	https://twitter.com/moyashi_mou2
2,3	2803142	エノキドォ	https://www.pixiv.net/en/users/4535430
2,4	114867	なまもななせ・海通信	https://www.pixiv.net/en/users/1167548
2,5	696477	みぞれまじ	https://www.pixiv.net/en/users/1502612
3,0	3509383	和菓子	https://www.pixiv.net/en/users/13748172
3,1	1803361	アチャコ	https://www.pixiv.net/en/users/1302618
3,2	2669609	Seedkeng	https://www.pixiv.net/en/users/11039166
3,3	2997827	吉崎 観音	https://twitter.com/yosRRX
3,4	3470661	テイク	https://www.pixiv.net/en/users/2096681
3,5	2975316	いたたたた	https://twitter.com/itatatata6

Table 2. Artist attribution for Figure 2 of the main paper.

Row,Col	Danbooru ID	Artist Handle	Artist URL
0,0	2953032	Dev@プロフィールを確認!!	https://www.pixiv.net/en/users/857300
0,1	2910278	shrimpえびちゃん	https://www.pixiv.net/en/users/3989209
0,2	2104903	枚方ガルダイナ	https://twitter.com/hgd_AG
0,3	714536	steward B	https://www.pixiv.net/en/users/2212889
0,4	2690308	aken@お仕事募集中	https://www.pixiv.net/en/users/196317
0,5	2260893	ABBB	https://www.pixiv.net/en/users/4066325
1,0	3014412	Disco	https://www.pixiv.net/en/users/14377769
1,1	2239511	千里GAN (改名)	https://twitter.com/oshirase_gan
1,2	3657552	塩soda	https://twitter.com/kurau3
1,3	3587211	せんちゃ	https://www.pixiv.net/en/users/3388329
1,4	3478391	ぺろんちょ	https://www.pixiv.net/en/users/2689378
1,5	2925591	米山舞	https://www.pixiv.net/en/users/1554775
2,0	2444625	Pack	https://www.pixiv.net/en/users/6069171
2,1	2772952	しずまよしのり	https://twitter.com/M_ars
2,2	2847265	千羽ミハト (Mihato)	https://www.pixiv.net/en/users/485524
2,3	670776	芹ざわ_お仕事募集中	https://www.pixiv.net/en/users/1156416
2,4	2559537	infukun	https://www.pixiv.net/en/users/5065896
2,5	2655733	QBASE	https://www.pixiv.net/en/users/246248
3,0	2468752	アモニット	https://www.pixiv.net/en/users/1621147
3,1	777932	ヒエラポリスとバムッカレ	https://www.pixiv.net/en/users/873649
3,2	961167	ヒエラポリスとバムッカレ	https://www.pixiv.net/en/users/873649
3,3	2868154	菟_	https://www.pixiv.net/en/users/3621731
3,4	2723355	9Ro	https://twitter.com/RINGDDINGDONGX2
3,5	2982683	dairi	https://www.pixiv.net/en/users/4920496
4,0	3450286	さとうぼて	https://twitter.com/mrcosmoov
4,1	1376016	トレス	https://www.pixiv.net/en/users/2056112
4,2	2968950	LM7	https://www.pixiv.net/en/users/420928
4,3	3204663	Cowfee@home	https://twitter.com/cowfee_desu
4,4	2176604	ゴールデン@お仕事募集中	https://www.pixiv.net/en/users/8607687
4,5	892947	mizuki	https://www.pixiv.net/en/users/1050881
5,0	3561627	keti	https://www.pixiv.net/en/users/4705322
5,1	3006738	ささ吉	https://www.pixiv.net/en/users/7187584
5,2	2818640	しろもる	https://www.pixiv.net/en/users/19858643
5,3	3673940	Jiujiu girl	https://www.pixiv.net/en/users/1221354
5,4	3566370	2 番目のむみん	https://www.pixiv.net/en/users/8186490
5,5	3617376	まかだみあ	https://www.pixiv.net/en/users/2782928
6,0	1170740	黒星紅白	https://www.pixiv.net/en/users/178217
6,1	2889129	Anmi@画集発売中	https://www.pixiv.net/en/users/212801
6,2	591979	wk.	https://www.pixiv.net/en/users/142914
6,3	1974764	katsuragi (osaka8o2)	https://danbooru.donmai.us/artists/108387
6,4	3389838	るっぴ	https://twitter.com/gouya_yu0508
6,5	3357418	guitaro (yabasaki taro)	https://danbooru.donmai.us/artists/181484

Table 3. Artist attribution for Figure 1 in the supplementary materials.