Supplementary Material for "Learning to Rank Using Privileged Information"

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		SVM rank image	Rank Transfer image+attributes	SVM image	SVM+ image+attributes	Reference (SVM rank attributes)
1	Chimpanzee versus Giant panda	88.54 ± 0.58	$\mathbf{89.33 \pm 0.50}$	88.07 ± 0.57	88.88 ± 0.51	$\mathit{91.45 \pm 0.41}$
2	Chimpanzee versus Leopard	93.61 ± 0.27	93.70 ± 0.23	93.49 ± 0.29	$\mathbf{93.74 \pm 0.26}$	$\mathit{98.11 \pm 0.10}$
3	Chimpanzee versus Persian cat	89.98 ± 0.42	$\mathbf{91.00 \pm 0.39}$	89.88 ± 0.42	90.14 ± 0.40	$\mathit{96.78 \pm 0.24}$
4	Chimpanzee versus Pig	85.35 ± 0.56	$\mathbf{86.08 \pm 0.43}$	85.19 ± 0.53	85.64 ± 0.57	$\mathit{93.65 \pm 0.20}$
5	Chimpanzee versus Hippopotamus	85.93 ± 0.69	$\mathbf{86.92 \pm 0.45}$	86.31 ± 0.59	86.40 ± 0.55	$\mathit{94.67 \pm 0.25}$
6	Chimpanzee versus Humpback whale	97.95 ± 0.19	$\mathbf{98.08 \pm 0.18}$	97.74 ± 0.22	98.03 ± 0.18	$\mathit{99.93 \pm 0.00}$
7	Chimpanzee versus Raccoon	86.51 ± 0.44	$\mathbf{87.07 \pm 0.48}$	86.64 ± 0.47	87.01 ± 0.46	$\mathit{92.70 \pm 0.48}$
8	Chimpanzee versus Rat	84.84 ± 0.63	$\mathbf{86.67 \pm 0.56}$	84.83 ± 0.68	85.42 ± 0.53	$\mathit{95.86 \pm 0.16}$
9	Chimpanzee versus Seal	91.73 ± 0.42	91.54 ± 0.43	91.10 ± 0.59	$\mathbf{91.74 \pm 0.39}$	$\mathit{96.91 \pm 0.19}$
10	Giant panda versus Leopard	$\mathbf{94.20 \pm 0.39}$	93.76 ± 0.29	94.03 ± 0.28	93.71 ± 0.38	$\mathit{97.88 \pm 0.13}$
11	Giant panda versus Persian cat	$\mathbf{92.82 \pm 0.38}$	92.57 ± 0.43	92.66 ± 0.32	92.55 ± 0.41	$\mathit{93.60 \pm 0.32}$
12	Giant panda versus Pig	$\mathbf{86.69 \pm 0.39}$	86.22 ± 0.52	86.55 ± 0.40	86.64 ± 0.45	$\mathit{91.08 \pm 0.34}$
13	Giant panda versus Hippopotamus	90.72 ± 0.54	$\mathbf{90.89 \pm 0.36}$	89.93 ± 0.56	90.04 ± 0.56	$\mathit{96.48 \pm 0.14}$
14	Giant panda versus Humpback whale	98.37 ± 0.14	$\mathbf{98.53 \pm 0.15}$	98.11 ± 0.19	98.38 ± 0.17	$\mathit{99.73 \pm 0.05}$
15	Giant panda versus Raccoon	$\mathbf{89.51 \pm 0.57}$	88.66 ± 0.60	89.06 ± 0.49	89.36 ± 0.44	$\mathit{91.42 \pm 0.39}$
16	Giant panda versus Rat	88.05 ± 0.60	87.53 ± 0.51	87.86 ± 0.48	$\mathbf{88.49 \pm 0.49}$	$\mathit{94.07 \pm 0.27}$
17	Giant panda versus Seal	$\mathbf{92.81 \pm 0.37}$	92.40 ± 0.40	92.59 ± 0.38	$\mathbf{92.81 \pm 0.32}$	$\mathit{96.25 \pm 0.24}$
18	Leopard versus Persian cat	95.18 ± 0.22	$\mathbf{95.26 \pm 0.25}$	94.93 ± 0.24	95.08 ± 0.25	$\mathit{98.42 \pm 0.09}$
19	Leopard versus Pig	88.39 ± 0.32	$\mathbf{88.90 \pm 0.28}$	88.37 ± 0.36	88.55 ± 0.28	$\mathit{97.02 \pm 0.17}$
20	Leopard versus Hippopotamus	92.95 ± 0.30	92.86 ± 0.26	92.73 ± 0.31	$\mathbf{92.98 \pm 0.29}$	$\mathit{97.04 \pm 0.21}$
21	Leopard versus Humpback whale	$\mathbf{98.63 \pm 0.22}$	$\mathbf{98.63 \pm 0.23}$	98.27 ± 0.33	98.49 ± 0.30	$\mathit{99.96 \pm 0.00}$
22	Leopard versus Raccoon	80.19 ± 0.71	79.84 ± 0.59	79.94 ± 0.73	$\mathbf{80.31 \pm 0.75}$	$\mathit{89.42 \pm 0.39}$
23	Leopard versus Rat	88.75 ± 0.39	$\mathbf{89.27 \pm 0.28}$	88.82 ± 0.35	88.74 ± 0.35	$\mathit{96.88 \pm 0.15}$
24	Leopard versus Seal	94.05 ± 0.30	$\mathbf{94.30 \pm 0.36}$	93.74 ± 0.37	93.87 ± 0.36	$\mathit{98.10 \pm 0.08}$
25	Persian cat versus Pig	81.50 ± 0.59	$\mathbf{81.68 \pm 0.46}$	81.45 ± 0.57	81.55 ± 0.59	$\mathit{82.03 \pm 0.41}$
26	Persian cat versus Hippopotamus	92.44 ± 0.32	$\mathbf{92.82 \pm 0.30}$	92.33 ± 0.33	92.42 ± 0.34	$\mathit{96.80 \pm 0.13}$
27	Persian cat versus Humpback whale	95.84 ± 0.34	95.84 ± 0.30	95.45 ± 0.38	$\mathbf{95.92 \pm 0.29}$	$\mathit{99.83 \pm 0.01}$
28	Persian cat versus Raccoon	90.37 ± 0.43	$\mathbf{90.38 \pm 0.39}$	90.31 ± 0.41	90.19 ± 0.40	$\mathit{92.46 \pm 0.29}$
29	Persian cat versus Rat	67.86 ± 0.58	$\mathbf{69.07 \pm 0.48}$	67.56 ± 0.63	67.19 ± 0.60	$\mathit{68.71 \pm 0.71}$
30	Persian cat versus Seal	84.60 ± 0.56	$\mathbf{85.66 \pm 0.49}$	84.46 ± 0.54	84.79 ± 0.60	$\mathit{93.72 \pm 0.24}$
31	Pig versus Hippopotamus	73.94 ± 0.56	$\mathbf{75.57 \pm 0.58}$	73.47 ± 0.55	74.42 ± 0.48	$\mathit{86.37 \pm 0.56}$
32	Pig versus Humpback whale	$\mathbf{96.04 \pm 0.30}$	95.93 ± 0.37	95.75 ± 0.30	96.01 ± 0.33	$\mathit{99.50 \pm 0.05}$
33	Pig versus Raccoon	77.38 ± 0.85	$\mathbf{79.13 \pm 0.63}$	76.96 ± 0.85	77.73 ± 0.80	$\mathit{89.76 \pm 0.70}$
34	Pig versus Rat	68.97 ± 0.46	$\mathbf{70.77 \pm 0.73}$	68.58 ± 0.41	68.66 ± 0.76	$\mathit{82.02 \pm 0.54}$
35	Pig versus Seal	78.09 ± 0.72	$\mathbf{79.26 \pm 0.77}$	77.32 ± 0.73	77.91 ± 0.71	$\mathit{88.32 \pm 0.41}$
36	Hippopotamus versus Humpback whale	$\mathbf{92.43 \pm 0.37}$	92.17 ± 0.44	91.64 ± 0.60	92.19 ± 0.44	$\mathit{98.56 \pm 0.13}$
37	Hippopotamus versus Raccoon	85.31 ± 0.57	$\mathbf{85.84 \pm 0.70}$	85.03 ± 0.60	85.54 ± 0.60	$\mathit{93.25 \pm 0.40}$
38	Hippopotamus versus Rat	84.44 ± 0.38	$\mathbf{85.62 \pm 0.48}$	84.25 ± 0.37	84.49 ± 0.39	$\mathit{93.79 \pm 0.30}$
39	Hippopotamus versus Seal	70.02 ± 0.67	$\mathbf{70.83 \pm 0.79}$	69.43 ± 0.84	69.79 ± 0.83	$\mathit{77.56 \pm 0.55}$
40	Humpback whale versus Raccoon	96.69 ± 0.30	$\mathbf{96.90 \pm 0.29}$	96.57 ± 0.31	96.67 ± 0.28	$\mathit{99.79 \pm 0.02}$
41	Humpback whale versus Rat	94.26 ± 0.21	$\mathbf{94.56 \pm 0.22}$	93.97 ± 0.24	94.52 ± 0.19	$\mathit{99.66 \pm 0.02}$
42	Humpback whale versus Seal	84.13 ± 0.47	$\mathbf{84.81 \pm 0.38}$	84.24 ± 0.49	84.60 ± 0.49	$\mathit{96.52 \pm 0.19}$
43	Raccoon versus Rat	78.26 ± 0.48	$\mathbf{78.61 \pm 0.72}$	78.36 ± 0.54	77.65 ± 0.64	$\mathit{84.93 \pm 0.60}$
44	Raccoon versus Seal	91.46 ± 0.40	$\mathbf{91.51 \pm 0.40}$	91.37 ± 0.38	91.43 ± 0.36	$\mathit{93.09 \pm 0.46}$
45	Rat versus Seal	78.67 ± 0.67	$\mathbf{79.88 \pm 0.69}$	78.28 ± 0.75	78.45 ± 0.65	$\mathit{92.01 \pm 0.33}$

Table 1: AwA dataset (attributes as privileged information). The numbers are mean and standard error of the AP performance over 20 runs with $N = 50$ training samples per class. The best result is highlighted in **boldface**, which in total is **8** for SVM rank, **32** for Rank Transfer, **0** for SVM, and **7** for SVM+ (with equality in the 17th and 21st pairs). Highlighted blue indicates significant improvement of the methods that utilize privileged information (Rank Transfer and/or SVM+) over the methods that do not (SVM rank and SVM), using a paired Wilcoxon test with 95% confidence level. Additionally, we also provide the SVM rank performance on $\mathcal{X}^*$ (last column).

	SVM rank image	Rank Transfer image+bbox	SVM image	SVM+ image+bbox	Reference (SVM rank bbox)
Soccer ball	76.56 ± 0.50	77.30 ± 0.33	77.06 ± 0.43	$\mathbf{77.84 \pm 0.23}$	*81.21 ± 0.31*
Croquet ball	78.95 ± 0.74	$\mathbf{79.85 \pm 0.54}$	79.52 ± 0.66	79.35 ± 0.58	*82.14 ± 0.55*
Golf ball	79.91 ± 0.41	80.21 ± 0.41	80.09 ± 0.42	$\mathbf{80.62 \pm 0.56}$	*77.40 ± 0.43*
Ping-pong ball	78.54 ± 0.60	$\mathbf{78.69 \pm 0.60}$	78.56 ± 0.63	77.80 ± 0.72	*80.31 ± 0.46*
Rugby ball	91.06 ± 0.16	90.90 ± 0.21	$\mathbf{91.30 \pm 0.14}$	91.23 ± 0.17	*73.84 ± 0.75*
Tennis ball	75.97 ± 0.43	76.21 ± 0.35	$\mathbf{76.34 \pm 0.24}$	75.57 ± 0.67	*74.35 ± 0.63*

Table 2: ImageNet dataset, group of sport balls (bounding box annotation as privileged information). The numbers are mean and standard error of the AP performance over 10 runs. The best result is highlighted in **boldface**. We also provide the SVM rank performance on $\mathcal{X}^*$.

Additional experiment: Margin Transfer

We conduct a set of experiments where we first identify easy and hard examples in the privileged space and then the transfer margin distance from the privileged space to the original space. The corresponding method is summarized in Algorithm 1. We ignore samples that are incorrectly classified in the privileged space, i.e. if $y_i \rho_i < 0$.

Algorithm 1 Margin Transfer from $\mathcal{X}^*$ to $\mathcal{X}$

Input original data X, privileged data X^*, labels Y
$f^* \leftarrow$ SVM trained on (X^*, Y)
$\rho_i = f^*(x_i^*)$ *(per-sample margin)*
$f \leftarrow$ SVM trained on (X, Y) using ρ_i instead of unit margin
Return $f : \mathcal{X} \to \mathbb{R}$

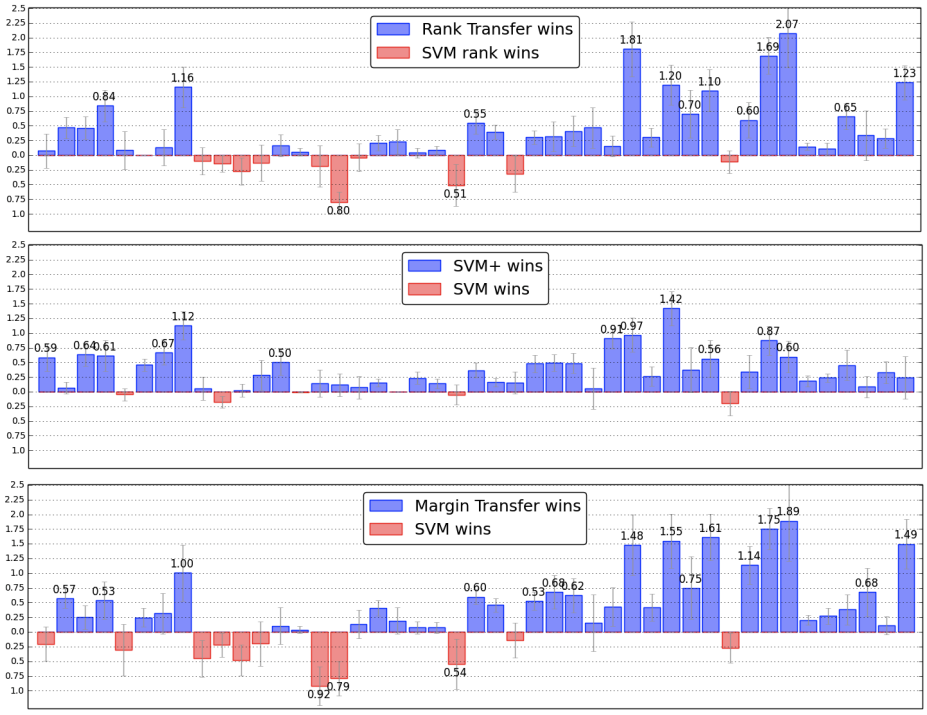

Figure 1: AwA dataset (attributes as privileged information). Pairwise comparison of the methods that utilize privileged information and their baseline counterparts is shown via difference of the AP performance (Rank Transfer versus SVM rank, SVM+ versus SVM, Margin Transfer versus SVM).

		SVM rank image	Rank Transfer image+attributes	SVM image	SVM+ image+attributes	Margin Transfer image+attributes
1	Chimpanzee versus Giant panda	91.76 ± 0.35	91.83 ± 0.37	91.53 ± 0.36	$\mathbf{92.12 \pm 0.40}$	91.33 ± 0.38
2	Chimpanzee versus Leopard	94.33 ± 0.35	$\mathbf{94.80 \pm 0.29}$	94.16 ± 0.35	94.23 ± 0.39	94.73 ± 0.31
3	Chimpanzee versus Persian cat	91.39 ± 0.43	$\mathbf{91.86 \pm 0.38}$	91.09 ± 0.44	91.73 ± 0.38	91.34 ± 0.39
4	Chimpanzee versus Pig	87.75 ± 0.36	$\mathbf{88.59 \pm 0.25}$	87.45 ± 0.33	88.06 ± 0.43	87.98 ± 0.30
5	Chimpanzee versus Hippopotamus	87.49 ± 0.37	87.57 ± 0.42	$\mathbf{87.58 \pm 0.36}$	87.53 ± 0.36	87.27 ± 0.44
6	Chimpanzee versus Humpback whale	98.52 ± 0.18	98.52 ± 0.15	98.12 ± 0.18	$\mathbf{98.57 \pm 0.16}$	98.37 ± 0.18
7	Chimpanzee versus Raccoon	89.41 ± 0.35	89.54 ± 0.29	89.00 ± 0.38	$\mathbf{89.67 \pm 0.35}$	89.32 ± 0.28
8	Chimpanzee versus Rat	87.31 ± 0.51	$\mathbf{88.47 \pm 0.45}$	86.84 ± 0.62	87.96 ± 0.53	87.84 ± 0.45
9	Chimpanzee versus Seal	$\mathbf{92.68 \pm 0.34}$	92.58 ± 0.36	92.53 ± 0.38	92.59 ± 0.35	92.08 ± 0.39
10	Giant panda versus Leopard	$\mathbf{95.26 \pm 0.24}$	95.11 ± 0.21	95.13 ± 0.24	94.95 ± 0.27	94.90 ± 0.21
11	Giant panda versus Persian cat	94.66 ± 0.28	94.38 ± 0.23	94.66 ± 0.28	$\mathbf{94.68 \pm 0.26}$	94.18 ± 0.24
12	Giant panda versus Pig	88.82 ± 0.40	88.69 ± 0.45	88.67 ± 0.46	$\mathbf{88.95 \pm 0.42}$	88.48 ± 0.48
13	Giant panda versus Hippopotamus	92.62 ± 0.44	92.78 ± 0.43	92.35 ± 0.43	$\mathbf{92.85 \pm 0.42}$	92.45 ± 0.53
14	Giant panda versus Humpback whale	98.83 ± 0.18	$\mathbf{98.88 \pm 0.14}$	98.77 ± 0.20	98.76 ± 0.22	98.81 ± 0.18
15	Giant panda versus Raccoon	91.52 ± 0.35	91.33 ± 0.37	91.76 ± 0.34	$\mathbf{91.90 \pm 0.40}$	90.85 ± 0.31
16	Giant panda versus Rat	$\mathbf{91.13 \pm 0.36}$	90.33 ± 0.41	90.50 ± 0.42	90.61 ± 0.47	89.71 ± 0.51
17	Giant panda versus Seal	$\mathbf{93.63 \pm 0.31}$	93.58 ± 0.26	93.33 ± 0.29	93.40 ± 0.24	93.46 ± 0.30
18	Leopard versus Persian cat	95.72 ± 0.21	$\mathbf{95.92 \pm 0.18}$	95.50 ± 0.25	95.65 ± 0.26	95.90 ± 0.21
19	Leopard versus Pig	90.65 ± 0.20	$\mathbf{90.88 \pm 0.25}$	90.40 ± 0.20	90.40 ± 0.18	90.59 ± 0.25
20	Leopard versus Hippopotamus	93.78 ± 0.27	93.81 ± 0.28	93.60 ± 0.28	$\mathbf{93.83 \pm 0.27}$	93.67 ± 0.29
21	Leopard versus Humpback whale	99.08 ± 0.08	99.17 ± 0.08	99.06 ± 0.09	$\mathbf{99.20 \pm 0.07}$	99.13 ± 0.09
22	Leopard versus Raccoon	$\mathbf{83.66 \pm 0.57}$	83.15 ± 0.57	83.23 ± 0.60	83.18 ± 0.64	82.69 ± 0.49
23	Leopard versus Rat	90.43 ± 0.19	$\mathbf{90.98 \pm 0.26}$	90.28 ± 0.24	90.65 ± 0.26	90.88 ± 0.28
24	Leopard versus Seal	95.10 ± 0.22	$\mathbf{95.49 \pm 0.19}$	94.98 ± 0.23	95.14 ± 0.22	95.44 ± 0.17
25	Persian cat versus Pig	$\mathbf{83.71 \pm 0.49}$	83.39 ± 0.58	83.23 ± 0.44	83.38 ± 0.51	83.09 ± 0.56
26	Persian cat versus Hippopotamus	93.11 ± 0.39	$\mathbf{93.41 \pm 0.34}$	92.66 ± 0.38	93.14 ± 0.35	93.18 ± 0.37
27	Persian cat versus Humpback whale	96.94 ± 0.33	$\mathbf{97.26 \pm 0.29}$	96.19 ± 0.39	96.69 ± 0.39	96.87 ± 0.36
28	Persian cat versus Raccoon	90.79 ± 0.41	$\mathbf{91.20 \pm 0.35}$	90.46 ± 0.45	90.94 ± 0.47	91.08 ± 0.42
29	Persian cat versus Rat	69.94 ± 0.52	$\mathbf{70.40 \pm 0.48}$	69.38 ± 0.46	69.43 ± 0.43	69.53 ± 0.55
30	Persian cat versus Seal	86.75 ± 0.64	86.91 ± 0.58	86.06 ± 0.66	$\mathbf{86.97 \pm 0.71}$	86.48 ± 0.58
31	Pig versus Hippopotamus	77.21 ± 0.58	$\mathbf{79.02 \pm 0.63}$	76.45 ± 0.53	77.42 ± 0.54	77.93 ± 0.68
32	Pig versus Humpback whale	97.02 ± 0.22	$\mathbf{97.32 \pm 0.18}$	96.78 ± 0.31	97.04 ± 0.19	97.19 ± 0.24
33	Pig versus Raccoon	80.60 ± 0.56	$\mathbf{81.79 \pm 0.57}$	80.08 ± 0.53	81.50 ± 0.53	81.63 ± 0.48
34	Pig versus Rat	72.98 ± 0.60	$\mathbf{73.68 \pm 0.53}$	72.25 ± 0.58	72.63 ± 0.50	73.00 ± 0.46
35	Pig versus Seal	80.67 ± 0.72	$\mathbf{81.76 \pm 0.65}$	79.76 ± 0.74	80.33 ± 0.68	81.38 ± 0.63
36	Hippopotamus versus Humpback whale	$\mathbf{93.86 \pm 0.33}$	93.75 ± 0.33	93.83 ± 0.28	93.63 ± 0.30	93.56 ± 0.33
37	Hippopotamus versus Raccoon	86.77 ± 0.64	87.37 ± 0.61	86.49 ± 0.57	86.83 ± 0.68	$\mathbf{87.63 \pm 0.51}$
38	Hippopotamus versus Rat	85.68 ± 0.44	$\mathbf{87.37 \pm 0.38}$	85.12 ± 0.44	85.99 ± 0.39	86.87 ± 0.41
39	Hippopotamus versus Seal	73.78 ± 0.67	$\mathbf{75.85 \pm 0.67}$	72.82 ± 0.69	73.41 ± 0.60	74.71 ± 0.80
40	Humpback whale versus Raccoon	97.01 ± 0.24	$\mathbf{97.15 \pm 0.22}$	96.92 ± 0.25	97.11 ± 0.22	97.13 ± 0.21
41	Humpback whale versus Rat	95.43 ± 0.21	$\mathbf{95.53 \pm 0.18}$	95.21 ± 0.21	95.45 ± 0.21	95.48 ± 0.17
42	Humpback whale versus Seal	86.28 ± 0.56	$\mathbf{86.93 \pm 0.47}$	86.44 ± 0.52	86.89 ± 0.52	86.82 ± 0.40
43	Raccoon versus Rat	79.97 ± 0.46	$\mathbf{80.31 \pm 0.56}$	79.59 ± 0.47	79.67 ± 0.44	80.26 ± 0.48
44	Raccoon versus Seal	92.52 ± 0.28	$\mathbf{92.80 \pm 0.24}$	92.22 ± 0.28	92.55 ± 0.23	92.33 ± 0.27
45	Rat versus Seal	81.11 ± 0.62	$\mathbf{82.34 \pm 0.62}$	80.44 ± 0.64	80.68 ± 0.73	81.94 ± 0.64

Table 3: AwA dataset (attributes as privileged information).

	SVM rank image	Rank Transfer image+bbox	SVM image	SVM+ image+bbox	Margin Transfer image+bbox
Soccer ball	76.56 ± 0.50	77.30 ± 0.33	77.06 ± 0.43	$\mathbf{77.84 \pm 0.23}$	77.00 ± 0.40
Croquet ball	78.95 ± 0.74	$\mathbf{79.85 \pm 0.54}$	79.52 ± 0.66	79.35 ± 0.58	$\mathbf{79.85 \pm 0.47}$
Golf ball	79.91 ± 0.41	80.21 ± 0.41	80.09 ± 0.42	$\mathbf{80.62 \pm 0.56}$	79.92 ± 0.35
Ping-pong ball	78.54 ± 0.60	$\mathbf{78.69 \pm 0.60}$	78.56 ± 0.63	77.80 ± 0.72	78.64 ± 0.55
Rugby ball	91.06 ± 0.16	90.90 ± 0.21	$\mathbf{91.30 \pm 0.14}$	91.23 ± 0.17	91.21 ± 0.16
Tennis ball	75.97 ± 0.43	76.21 ± 0.35	$\mathbf{76.34 \pm 0.24}$	75.57 ± 0.67	76.27 ± 0.29

Table 4: ImageNet dataset, group of sport balls (bounding box annotation as privileged information).

	SVM rank image	Rank Transfer image+bbox	SVM image	SVM+ image+bbox	Margin Transfer image+bbox
Thunder snake	66.48 ± 0.72	66.23 ± 0.73	66.51 ± 0.72	$\mathbf{67.52 \pm 0.37}$	66.28 ± 1.07
Ringneck snake	73.33 ± 0.63	73.32 ± 0.68	73.71 ± 0.82	73.51 ± 0.59	$\mathbf{73.86 \pm 0.79}$
Hognose snake	72.33 ± 0.60	72.67 ± 0.61	72.54 ± 0.42	$\mathbf{72.89 \pm 0.61}$	72.38 ± 0.37
Green snake	76.91 ± 0.66	$\mathbf{77.22 \pm 0.66}$	77.01 ± 0.70	76.25 ± 0.97	77.07 ± 0.85
King snake	85.99 ± 0.27	86.22 ± 0.36	85.44 ± 0.34	$\mathbf{86.67 \pm 0.26}$	85.36 ± 0.42
Garter snake	$\mathbf{83.74 \pm 0.61}$	83.51 ± 0.60	81.57 ± 0.68	83.41 ± 0.89	81.78 ± 0.73
Water snake	72.07 ± 0.57	71.92 ± 0.50	73.03 ± 0.57	72.01 ± 0.86	$\mathbf{73.22 \pm 0.49}$
Vine snake	85.24 ± 0.51	85.21 ± 0.51	$\mathbf{85.81 \pm 0.51}$	85.06 ± 0.56	85.57 ± 0.42
Night snake	57.69 ± 1.37	57.64 ± 1.25	58.17 ± 1.39	$\mathbf{58.39 \pm 1.06}$	57.61 ± 1.44
Boa constrictor	81.44 ± 0.71	81.59 ± 0.69	79.88 ± 0.80	$\mathbf{82.15 \pm 0.72}$	80.09 ± 0.82
Rock python	65.56 ± 1.14	65.92 ± 1.18	64.16 ± 1.35	$\mathbf{66.94 \pm 0.83}$	64.22 ± 1.31
Indian cobra	65.90 ± 0.95	65.89 ± 1.02	66.20 ± 0.96	$\mathbf{66.38 \pm 0.44}$	65.67 ± 1.28
Green mamba	75.30 ± 0.25	75.62 ± 0.32	76.18 ± 0.46	76.07 ± 0.42	$\mathbf{76.23 \pm 0.46}$
Sea snake	87.70 ± 0.45	87.91 ± 0.48	87.86 ± 0.38	$\mathbf{88.26 \pm 0.37}$	88.04 ± 0.44
Horned viper	77.00 ± 0.47	77.36 ± 0.45	77.09 ± 0.51	$\mathbf{77.84 \pm 0.59}$	76.93 ± 0.47
Diamondback	83.69 ± 0.70	84.19 ± 0.60	82.00 ± 0.50	$\mathbf{84.29 \pm 0.52}$	82.20 ± 0.50
Sidewinder	75.03 ± 0.68	$\mathbf{75.90 \pm 0.67}$	74.56 ± 1.10	75.47 ± 0.94	75.13 ± 0.77

Table 5: ImageNet dataset, group of snakes (bounding box annotation as privileged information).

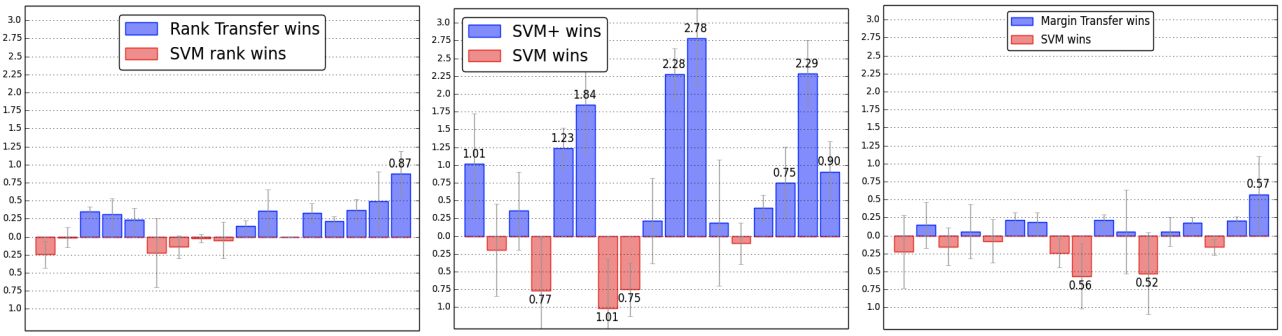

Figure 2: ImageNet dataset, group of snakes (bounding box annotation as privileged information). Pairwise comparison of the methods that utilize privileged information and their baseline counterparts is shown via difference of the AP performance (Rank Transfer versus SVM rank, SVM+ versus SVM, Margin Transfer versus SVM).

	SVM rank image	Rank Transfer image+text	SVM image	SVM+ image+text	Margin Transfer image+text
Nature versus Religion	89.06 ± 0.34	89.28 ± 0.24	89.51 ± 0.27	89.41 ± 0.26	89.79 ± 0.25
Religion versus Urban	71.82 ± 0.66	71.71 ± 0.59	72.04 ± 0.56	72.11 ± 0.40	71.54 ± 0.64
Nature versus Urban	88.56 ± 0.23	88.94 ± 0.22	88.85 ± 0.24	88.92 ± 0.23	88.72 ± 0.26

Table 6: Israeli dataset (textual description as privileged information).

	SVM rank image	Rank Transfer image+rationale	SVM image	SVM+ image+rationale	Margin Transfer image+rationale
Female N=100	58.06 ± 1.40	56.58 ± 1.34	57.58 ± 1.39	57.06 ± 1.49	59.63 ± 1.65
Male N=100	72.33 ± 1.82	75.50 ± 1.97	72.25 ± 1.75	73.58 ± 1.81	71.41 ± 1.94

Table 7: HotOrNot dataset (rationale as privileged information).