Erratum: "Improving Topic Models with Latent Feature Word Representations"

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Abstract

Change in clustering and classification results due to the DMM and LF-DMM bugs.

4.3 Document clustering evaluation

FROM (in the original published article): For example with 40 topics on the TMNtitle dataset, the DMM achieves about 6% higher Purity and NMI scores than LDA.

TO: For example with 80 topics on the TMNtitle dataset, the DMM achieves about 7+% higher Purity and NMI scores than LDA.

FROM (in the original published article): on the short text TMN and TMNtitle datasets we obtain 3.6% and 3.0% higher Purity at $T = 80$.

TO: on the short text TMN and TMNtitle datasets we obtain 6.1% and 2.5% higher Purity at $T = 80$.

4.4 Document classification evaluation

FROM (in the original published article): In addition, our w2v-DMM model achieves 3.6% and 3.4% higher F_1 score than the DMM model on short TMN and TMNtitle datasets with $T = 80$, respectively.

TO: In addition, our w2v-DMM model achieves 5.4% and 2.9% higher F_1 score than the DMM model on short TMN and TMNtitle datasets with $T = 80$, respectively.

FROM (a part of Table 10 in the original published article): F_1 scores for TMN and TMNtitle datasets.

Data	Method	$\lambda = 0.6$			
		T=7	T=20	T=40	T=80
TMN	DMM	0.605 ± 0.023	0.724 ± 0.016	0.738 ± 0.008	0.741 ± 0.005
	w2v-DMM	0.619 ± 0.033	0.744 ± 0.009	0.759 ± 0.005	**0.777** ± 0.005
	glove-DMM	**0.624** ± 0.025	**0.757** ± 0.009	**0.761** ± 0.005	0.774 ± 0.010
	Improve.	0.019	0.033	0.023	0.036
TMNtitle	DMM	0.570 ± 0.022	0.650 ± 0.011	0.654 ± 0.008	0.646 ± 0.008
	w2v-DMM	0.562 ± 0.022	0.670 ± 0.012	0.677 ± 0.006	**0.680** ± 0.003
	glove-DMM	**0.592** ± 0.017	**0.674** ± 0.016	**0.683** ± 0.006	0.679 ± 0.009
	Improve.	0.022	0.024	0.029	0.034

TO: F_1 scores for TMN and TMNtitle datasets.

Data	Method	$\lambda = 0.6$			
		T=7	T=20	T=40	T=80
TMN	DMM	0.607 ± 0.040	0.694 ± 0.026	0.712 ± 0.014	0.721 ± 0.008
	w2v-DMM	0.607 ± 0.019	0.736 ± 0.025	**0.760** ± 0.011	0.771 ± 0.005
	glove-DMM	**0.621** ± 0.042	**0.750** ± 0.011	0.759 ± 0.006	**0.775** ± 0.006
	Improve.	0.014	0.056	0.048	0.054
TMNtitle	DMM	0.500 ± 0.021	0.600 ± 0.015	0.630 ± 0.016	0.652 ± 0.005
	w2v-DMM	0.528 ± 0.028	0.663 ± 0.008	0.682 ± 0.008	**0.681** ± 0.006
	glove-DMM	**0.565** ± 0.022	**0.680** ± 0.011	**0.684** ± 0.009	**0.681** ± 0.004
	Improve.	0.065	0.08	0.054	0.029

FROM (a part of Table 11 in the original published article): F_1 scores for Twitter dataset.

Data	Method	$\lambda = 0.6$			
		T=4	T=20	T=40	T=80
Twitter	DMM	0.505 ± 0.023	0.614 ± 0.012	0.634 ± 0.013	0.656 ± 0.011
	w2v-DMM	**0.541** ± 0.035	0.636 ± 0.015	**0.648** ± 0.011	**0.670** ± 0.010
	glove-DMM	0.539 ± 0.024	**0.638** ± 0.017	0.645 ± 0.012	0.666 ± 0.009
	Improve.	0.036	0.024	0.014	0.014

TO: F_1 scores for Twitter dataset.

Data	Method	$\lambda = 0.6$			
		T=4	T=20	T=40	T=80
Twitter	DMM	0.469 ± 0.014	0.600 ± 0.021	0.645 ± 0.009	0.665 ± 0.014
	w2v-DMM	**0.539** ± 0.016	0.649 ± 0.016	0.656 ± 0.007	0.676 ± 0.012
	glove-DMM	0.536 ± 0.027	**0.654** ± 0.019	**0.657** ± 0.008	**0.680** ± 0.009
	Improve.	0.07	0.054	0.012	0.015

FROM (a part of Table 7 in the original published article): Purity and NMI results on the TMN and TMNtitle datasets with the mixture weight $\lambda = 0.6$.

Data	Method	Purity				NMI			
		T=7	T=20	T=40	T=80	T=7	T=20	T=40	T=80
TMN	DMM	0.632 ± 0.025	0.719 ± 0.020	0.735 ± 0.010	0.742 ± 0.005	**0.445** ± 0.017	0.426 ± 0.010	0.397 ± 0.006	0.364 ± 0.002
	w2v-DMM	0.639 ± 0.024	0.741 ± 0.011	0.759 ± 0.006	**0.778** ± 0.005	0.437 ± 0.018	0.429 ± 0.004	0.402 ± 0.003	0.377 ± 0.002
	glove-DMM	**0.646** ± 0.022	**0.757** ± 0.009	**0.763** ± 0.005	0.775 ± 0.011	**0.445** ± 0.023	**0.443** ± 0.008	**0.404** ± 0.003	**0.378** ± 0.004
	Improve.	0.014	0.038	0.028	0.036	0.0	0.017	0.007	0.014
TMNtitle	DMM	0.598 ± 0.018	0.650 ± 0.011	0.657 ± 0.007	0.651 ± 0.008	**0.353** ± 0.012	0.317 ± 0.007	0.287 ± 0.004	0.257 ± 0.004
	w2v-DMM	0.583 ± 0.020	0.665 ± 0.012	0.674 ± 0.006	**0.681** ± 0.003	0.324 ± 0.013	0.329 ± 0.007	0.300 ± 0.003	0.277 ± 0.003
	glove-DMM	**0.601** ± 0.021	**0.670** ± 0.016	**0.680** ± 0.005	0.679 ± 0.008	**0.354** ± 0.013	**0.333** ± 0.009	**0.301** ± 0.003	**0.278** ± 0.003
	Improve.	0.003	0.02	0.023	0.03	0.001	0.016	0.014	0.021

TO: Purity and NMI results on the TMN and TMNtitle datasets with the mixture weight $\lambda = 0.6$.

Data	Method	Purity				NMI			
		T=7	T=20	T=40	T=80	T=7	T=20	T=40	T=80
TMN	DMM	0.637 ± 0.029	0.699 ± 0.015	0.707 ± 0.014	0.715 ± 0.009	0.445 ± 0.024	0.422 ± 0.007	0.393 ± 0.009	0.364 ± 0.006
	w2v-DMM	0.623 ± 0.020	0.737 ± 0.018	**0.760** ± 0.010	0.772 ± 0.005	0.426 ± 0.015	0.428 ± 0.009	0.405 ± 0.006	0.378 ± 0.003
	glove-DMM	**0.641** ± 0.042	**0.749** ± 0.011	0.758 ± 0.008	**0.776** ± 0.006	**0.449** ± 0.028	**0.441** ± 0.008	**0.408** ± 0.005	**0.381** ± 0.003
	Improve.	0.004	0.05	0.053	0.061	0.004	0.019	0.015	0.017
TMNtitle	DMM	0.558 ± 0.015	0.600 ± 0.010	0.634 ± 0.011	0.658 ± 0.006	0.338 ± 0.012	0.327 ± 0.006	0.304 ± 0.004	0.271 ± 0.002
	w2v-DMM	0.552 ± 0.022	0.653 ± 0.012	0.678 ± 0.007	0.682 ± 0.005	0.314 ± 0.016	0.325 ± 0.006	0.305 ± 0.004	**0.282** ± 0.003
	glove-DMM	**0.586** ± 0.019	**0.672** ± 0.013	**0.679** ± 0.009	**0.683** ± 0.004	**0.343** ± 0.015	**0.339** ± 0.007	**0.307** ± 0.004	**0.282** ± 0.002
	Improve.	0.028	0.072	0.045	0.025	0.005	0.012	0.003	0.011

FROM (a part of Table 8 in the original published article): Purity and NMI results on the Twitter dataset with the mixture weight $\lambda = 0.6$.

Data	Method	Purity				NMI			
		T=4	T=20	T=40	T=80	T=4	T=20	T=40	T=80
Twitter	DMM	0.552 ± 0.020	0.624 ± 0.010	0.647 ± 0.009	0.675 ± 0.009	0.194 ± 0.017	0.186 ± 0.006	0.184 ± 0.005	0.190 ± 0.003
	w2v-DMM	**0.581** ± 0.019	0.641 ± 0.013	**0.660** ± 0.010	**0.687** ± 0.007	0.230 ± 0.015	0.195 ± 0.007	**0.193** ± 0.004	**0.199** ± 0.005
	glove-DMM	0.580 ± 0.013	**0.644** ± 0.016	0.657 ± 0.008	0.684 ± 0.006	**0.232** ± 0.010	**0.201** ± 0.010	0.191 ± 0.006	0.195 ± 0.005
	Improve.	0.029	0.02	0.013	0.012	0.038	0.015	0.009	0.009

TO: Purity and NMI results on the Twitter dataset with the mixture weight $\lambda = 0.6$.

Data	Method	Purity				NMI			
		T=4	T=20	T=40	T=80	T=4	T=20	T=40	T=80
Twitter	DMM	0.523 ± 0.011	0.619 ± 0.015	0.660 ± 0.008	0.684 ± 0.010	0.222 ± 0.013	0.213 ± 0.011	0.198 ± 0.008	0.196 ± 0.004
	w2v-DMM	**0.589** ± 0.017	0.655 ± 0.015	**0.668** ± 0.008	0.694 ± 0.009	0.243 ± 0.014	0.215 ± 0.009	**0.203** ± 0.005	0.204 ± 0.006
	glove-DMM	0.583 ± 0.023	**0.661** ± 0.019	0.667 ± 0.009	**0.697** ± 0.009	**0.250** ± 0.020	**0.223** ± 0.014	0.201 ± 0.006	**0.206** ± 0.005
	Improve.	0.066	0.042	0.008	0.013	0.028	0.01	0.005	0.01