How to Diversify any Personalized Recommender? A User-centric Pre-processing approach

Anonymous Author(s)*

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1 APPENDIX

1.1 Characteristics of the Pre-Processed Data

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Table 1: Detailed statistics of the original data vs. pre-processed data with one-step and two-step variants. We have λ={0%, 1%, 2%, 5%, 10%}.

Data Sets		Pre-processing		#Users	#Click history/ #Interactions	Sparsity (%)	#Items	Features	
								#Categories	#Impressions
MIND News Subset	*Training Data*	***0***	None	1000	9368/39467	99.58	26740	17	7105
		1	1-Step	1000	9367/39467	99.58	26740	17	7105
			2-Step	1000	9364/39417	99.58	26740	17	7105
		2	1-Step	1000	9367/39766	99.58	26740	17	7105
			2-Step	1000	9364/39716	99.58	26740	17	7105
		5	1-Step	1000	9367/40383	99.57	26740	17	7105
			2-Step	1000	9365/40333	99.57	26740	17	7105
		10	1-Step	1000	9367/40387	99.57	26740	17	7105
			2-Step	1000	9364/40337	99.57	26740	17	7105
	Test Data	***None***	None	5000	15557	99.82	18723	16	7538
GoodBook Subset	*Training Data*	***0***	None	943	8477	98.77	729	31	-
		1	1-Step	943	8454	98.73	706	31	-
			2-Step	943	8354	98.75	706	31	-
		2	1-Step	943	8619	98.71	707	31	-
			2-Step	943	8499	98.73	707	31	-
		5	1-Step	943	9670	98.58	723	31	-
			2-Step	943	9290	98.64	723	31	-
		10	1-Step	943	11291	98.36	729	31	-
			2-Step	943	10271	98.51	729	31	-
	Test Data	***None***	None	943	4715	99.27	688	31	-

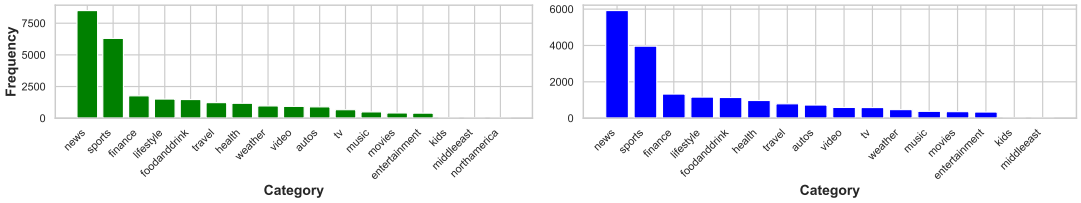


Figure 1: Categories of news in MIND Data. (Top) Categories of news in the train data. (Bottom) Categories of news in the test data.

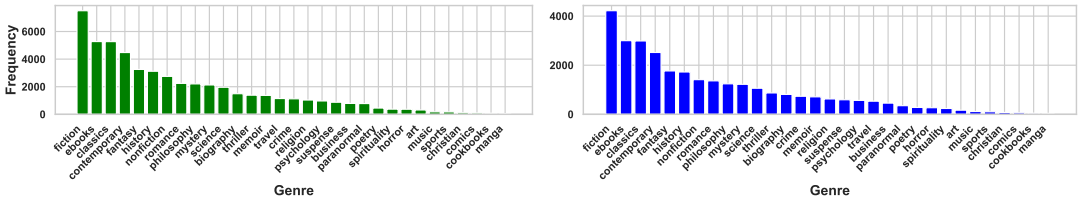
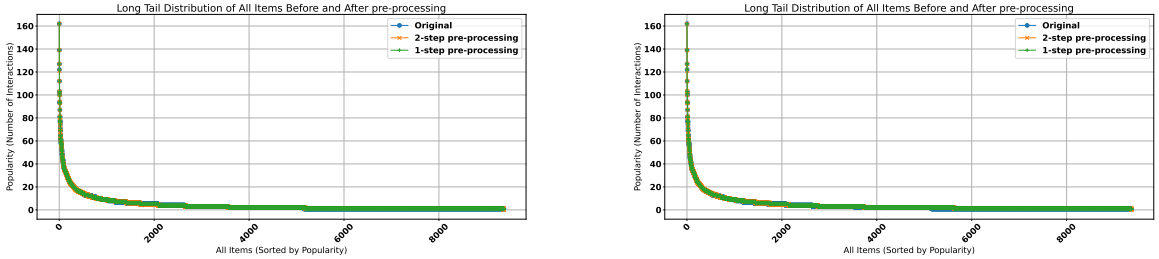
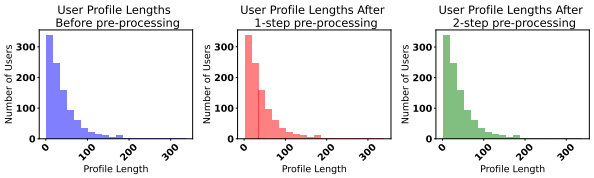


Figure 2: Genres of books in GoodBook Data. (Top) Genres of books in the train data. (Bottom) Genres of books in the test data.

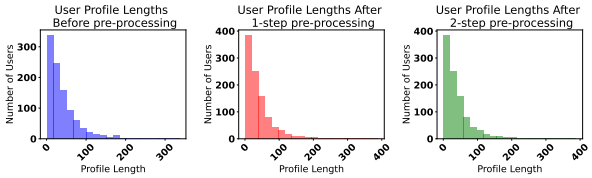


(a) 1% pre-processing **(b) 50% pre-processing**

Figure 3: Comparing items' long tail distribution on `MIND News data` for 1% (1-step and 2-step) pre-processing vs. 50% (1-step and 2-step) pre-processing.

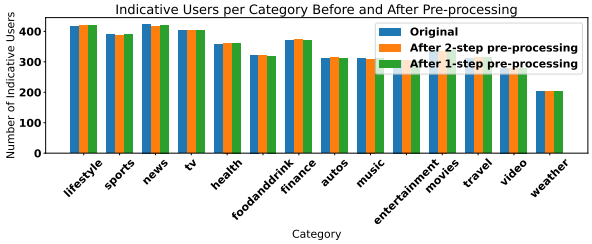


(a) 1% pre-processing

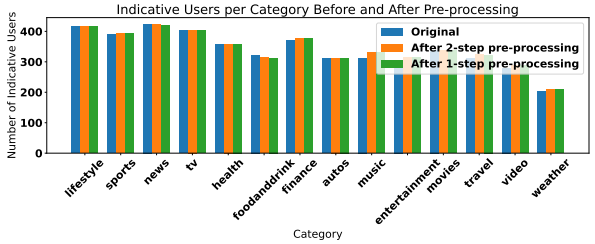


(b) 10% pre-processing

Figure 4: Comparing users' profile length on `MIND News data` for 1% (1-step and 2-step) pre-processing vs. 50% (1-step and 2-step) pre-processing.

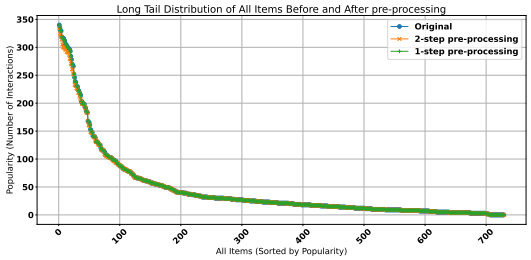


(a) 1% pre-processing

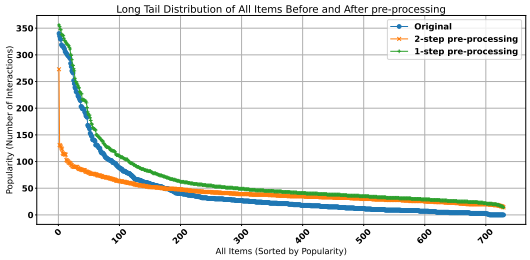


(b) 50% pre-processing

Figure 5: Comparing indicative users per category on `MIND News data` for 1% (1-step and 2-step) pre-processing vs. 50% (1-step and 2-step) pre-processing.

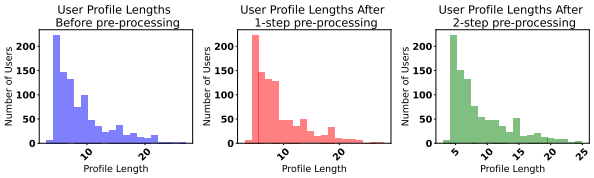


(a) 1% pre-processing

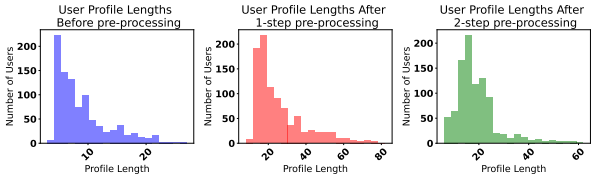


(b) 50% pre-processing

Figure 6: Comparing items' long tail distribution on `GoodBook data` for 1% (1-step and 2-step) pre-processing vs. 50% (1-step and 2-step) pre-processing.

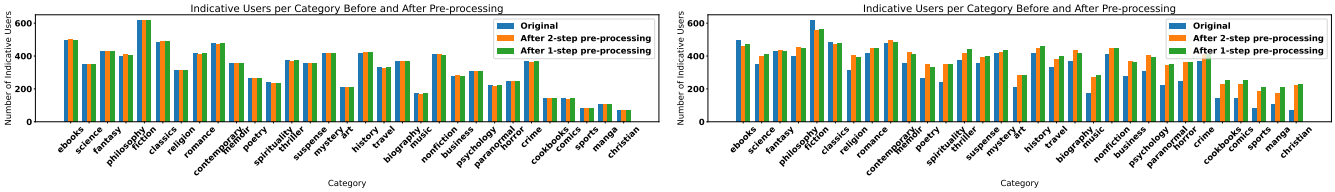


(a) 1% pre-processing



(b) 50% pre-processing

Figure 7: Comparing users' profile length on `GoodBook data` for 1% (1-step and 2-step) pre-processing vs. 50% (1-step and 2-step) pre-processing.



(a) 1% pre-processing

(b) 50% pre-processing

Figure 8: Comparing indicative users per category on `GoodBook data` for 1% (1-step and 2-step) pre-processing vs. 50% (1-step and 2-step) pre-processing.