

Exploring the Impact of Different Traits on Children's Book Recommendations

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Overview

Backgrounds

Recently, a few children-centered recommendation systems have been created and evaluated. However, these systems required user interaction to create ground truth to evaluate the result. There is no research that evaluates children's book RS with real world readerlike data.



Research Target

This research is designed to compare some traditional recommendation algorithms when targeting different age groups of users and explore which trait could impact the recommendation process most in RS.

Methods

Dataset

- 18K Books, each instance is associated with meta-data, including authors, series, editions, publishers, cover images, and sizes
- created from GoodReads[1,2] with 2.3M books instances.

Name	#Book	Average Similar Books
GDS	20092	8.11
GDS_Kindergarten	3708	7.84
GDS_Elementary	3567	6.85
GDS_Middle_School	2817	10.68
GDS_Adult	10000	7.94

Metrics

- Mean Reciprocal Rank
- Hits@5

Algorithms

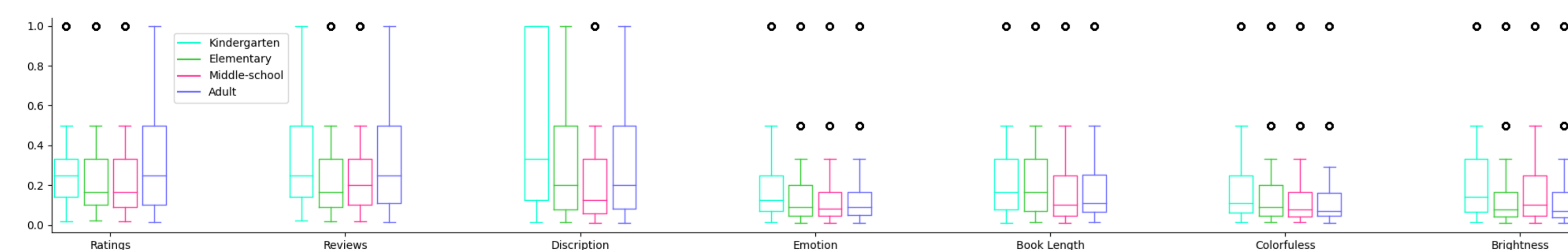
- Popular
- Description Similarity
- Emotion
- Book Length
- Cover Image (Brightness, Colorfulness)

Results and Discussion

Results

Dataset Name	Ratings	Reviews	Description	Emotion	Book Length	Colorfulness	Brightness
GDS	0.543	0.575	0.517	0.335	0.367	0.242	0.272
GDS_kindgarten	0.592	0.632	0.58	0.364	0.398	0.33	0.418
GDS_elementary	0.454	0.49	0.513	0.308	0.475	0.277	0.270
GDS_middle-school	0.475	0.545	0.409	0.326	0.339	0.239	0.264
GDS_adult	0.579	0.595	0.533	0.338	0.33	0.201	0.208

Hit@5 computed for different recommendation models across datasets capturing users of different ages



MRR Box Plot computed for different recommendation models across datasets capturing users of different ages

Findings

- The traditional model performs better than children friendly models.
- The traditional model performs better on Adults dataset
- Book Length is the best performance model among all children friendly recommendation models.
- The brighter and more colorful cover page attracts kindergarten children better.

Limitation and Future Work

- The data source similar book list is created with popularity
- More model can be tested in the future.
- It is possible to create a recommendation model based on emotion analysis and book length.

Reference

- [1] Mengting Wan, Julian McAuley, "Item Recommendation on Monotonic Behavior Chains", in RecSys'18.
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- [3] Sherrill, J., & Ng, Y. K. (2022). Promoting Reading Among Teens: Analyzing the Emotional Preferences of Teenage Readers. Handbook on Artificial Intelligence-Empowered Applied Software Engineering, 105-126. https://doi.org/10.1007/978-3-031-07650-3_7
- [4] Ng, Yiu Kai. "CBRec: a book recommendation system for children using the matrix factorisation and content-based filtering approaches". In: International Journal of Business Intelligence and Data Mining 16.2 (2020), p.
- [5] Milton, Ashlee et al. "Don't Judge a Book by its Cover": Exploring Book Traits Children Favor". In: RecSys 2020: Fourteenth ACM Conference on Recommender Systems, Virtual Event, Brazil, September 22-26, 2020. Ed. by Rodrygo L. T. Santos et al. ACM, 2020.