MITIGATING GENDER BIAS IN BOOK RECOMMENDATIONS

GROUP NO: 26

EXPLORING AND MITIGATING GENDER BIAS IN RECOMMENDER SYSTEMS WITH EXPLICIT FEEDBACK

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INTRODUCTION

Examine gender bias in book recommendations and evaluate the impact of debiasing techniques (log-bias adjustment, preference correction) on fairness and accuracy.

OBJECTIVE

- Explore gender bias in book recommendations.
- Apply methods to reduce bias and improve fairness.
- Compare KNN and Matrix Factorization models for accuracy.

RESEARCH QUESTION

How does gender bias impact book recommendations, and can debiasing techniques improve fairness?

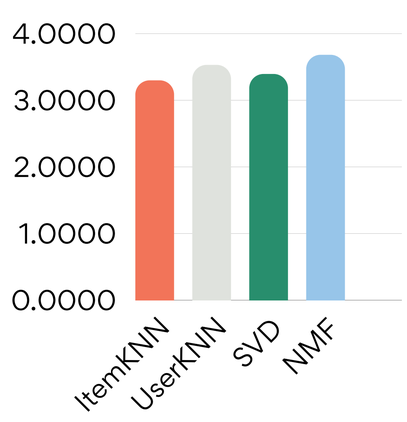
METHODOLOGY

- **Data:** Book ratings from the Book-Crossing dataset and author genders from the Gender-to-Name dataset.
- **Process:**
- Filtered books and users with enough data (50+ ratings).
- Mapped author gender and applied debiasing techniques to adjust ratings.
- Used KNN and Matrix Factorization models to make recommendations.
- **Evaluation:** Compared models using RMSE, NDCG, and MRR.

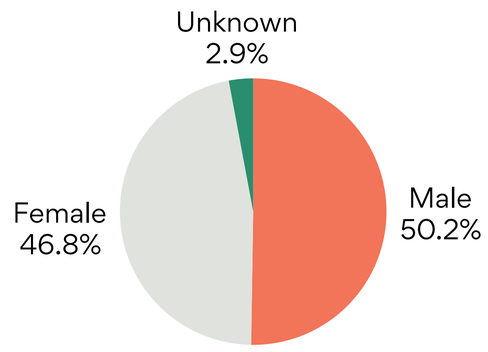
MOTIVATION

Gender bias in recommender systems can limit diversity and influence user choices. By addressing this bias, we can make recommendations more inclusive, fair, and trustworthy, enhancing the overall user experience.

VISUAL INSIGHTS



RMSE Comparison



Gender Distribution

FINDS

- **Gender Distribution:**
- Male: 50.24%, Female: 46.82%, Unknown: 2.94%
- **Best Performance (RMSE):** ItemKNN (3.2992)
- **NDCG & MRR:**
- **Biased Model:** Higher performance (NDCG: 0.9664, MRR: 0.9664)
- **Debiased Model:** Improved fairness (NDCG: 0.8007, MRR: 0.8007), More fair but slightly lower performance.
- **Top-N Recommendations:**
- Debiasing improved fairness and diversity.

CONCLUSION

- Debiasing made recommendations fairer, but it slightly affected the model's accuracy.
- KNN models performed better in terms of accuracy, but both KNN and Matrix Factorization benefited from debiasing.
- Reducing gender bias helps create more inclusive and diverse recommendations for users.