Trust in Recommender Systems: A Survey

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Introduction

- With the increase in popularity on AI, Various services in the world are going to be heavily dependent on AI, especially Recommendation systems.
- Already recommendation systems have their way in many places such as Netflix Recommended Movies, Amazon Recommended Products, Google recommended news, Facebook recommended friends systems, Instagram recommended influencer Or the most popular YouTube recommended videos.

Aspects of Trust

- **1. Social Awareness**: How the recommendation system is leveraging the social behavior of a person and his peers.
- **2. Robustness**: How is the recommendation system able to leave out the noise created by data
- **3. Explainability**: if the end-user understands the factors that led to a particular recommendation

Social Aware Recommender Systems

- collaborative filtering, a simple and elegant way of recommendation. How other people in your friend circle has rated the product.
- Auto Encoder based methods, Neural network model helps to learn latent factors of users and user choices, which are not easily observable
- RNN based models deal with sequential and time-series data. Generally, capture the user's current preference .based on Users' online presence and activities online. Facebook uses this method
- GNN based Models, Mines Social Graph structure. This is a fairly complex procedure. In this Method Users History,
 Users Neighbours History and their Neighbours history and so on is aggregated. And likes and dislikes are stored.
 And on that data recommendation is produced. This GNN is always improving. Google, Facebook uses this
 technique.
- Hybrid Methods, All the above methods are used parallelly and a common recommendation system is also created.

Robustness of Recommender Systems

 merchants may hire a group of spammers to insert their profiles and fake ratings into the systems, which will affect the performance of the recommendation and also the customer's trust in recommender systems

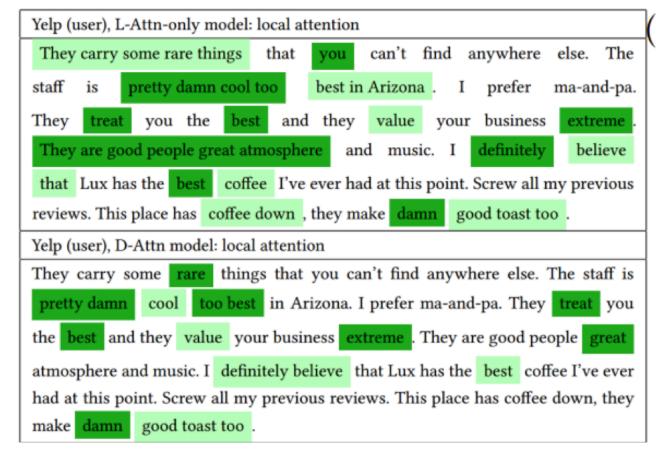
- 1. Shilling Attack Detection Algorithms
- 2. Deep Learning-based Shilling Attack Detection Algorithms

Explaining Collaborative filtering;

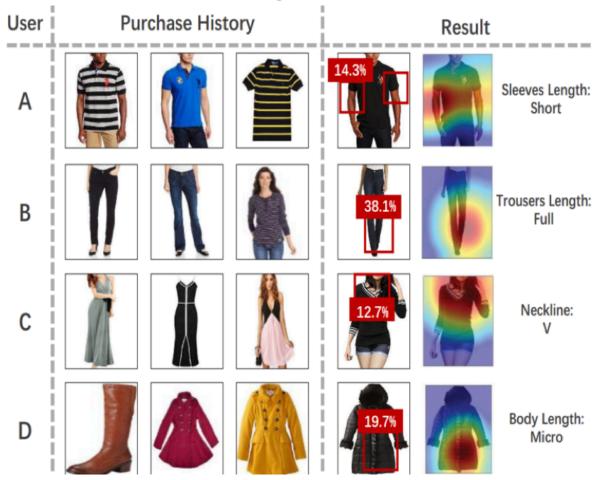
Your neighbors' rating for this movie



Explaining Textual Data:



• Explaining on Visual Data:



• Visual Data + NLP:



Conclusion

- We discussed various techniques with which we can establish TRUST in the Recommendation system. With Days to come with advancement of Artificial Intelligence and machine learning.
- The **TRUSTability** of these systems is going to be a key factor. And This paper is a step towards that future