Trust Aware Recommendation Systems

Recommendation Systems

- Solution to information overload problem.
- Try to find items such as books or movies that match best with users' preferences.
- Based on the approaches recommendation systems can be classified into two major groups:
  - Content-based Recommendation.
  - Collaborative Filtering.

How They Work

Content-based

- Use Items' features and characteristics to rank the items based on the user's preferences.

Collaborative Filtering

- Rely on user's past behavior e.g., purchases or ratings, to find similar users or items and utilize this information in order to find items of interest to the user.

Problems

Cold Start

- A situation where the algorithm's effectiveness is very low because items' (or users') vector do not have enough rated items to find vectors similar to them.

Attacks

- Designed to drive recommender system to act in a way that the attacker wishes.
- Either recommend some desired items or prevent recommendation of other items.
- Set of attack profiles each containing biased rating data associated with fictitious user.

Solution:

Trust Aware Recommendation Systems

Users are influenced by their trustworthy friends, and are more likely to accept recommendations made by them.

Overview

- Trust-aware recommender systems employ trust information to enhance recommender systems.
- Merging trust information and recommender systems can improve the accuracy of the recommender system as well as users' experience.
- They are also capable of handling some challenges of classical recommender systems such as cold-start and responding to attacks.

Deliverables

Implement some of the state-of-the-art trust aware recommendation systems and improve them thereafter.

Co-factorization Methods:
SoRec: social recommendation using probabilistic matrix factorization. In Proceeding of the 17th ACM Conference on Information and Knowledge Management , pages 931–940. ACM, 2008. DOI: 10.1145/1458082.1458205.

LOCABAL: Exploiting local and global social context for recommendation. In Proceedings of the Twenty-Third International Joint Conference on Artificial Intelligence , pages 2712–2718. AAAI Press, 2013.

Ensemble Methods:
STE: Learning to recommend with social trust ensemble. In
Proceedings of the 32nd International ACM SIGIR Conference on Research and Development in Information Retrieval , pages 203–210. ACM, 2009. DOI: 10.1145/1571941.1571978.

Regularization Methods:
SocialMF: A matrix factorization technique with trust propagation for recommendation in social networks. In Proceedings of the Fourth ACM Conference on Recommender Systems , pages 135–142. ACM, 2010. DOI: 10.1145/1864708.1864736nd responding to attacks.

Thanks!

Student Info:

P. Rishith Reddy
201401159

rishith.reddy@students.iiit.ac.in