**Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions**

In the context of Content based Recsys (Recommending items most similar to the ones rated by the user) –

Overspecialization problem: - A person with no experience in Greek cuisine will never receive recommendations for Greek restaurants in town. Cannot recommend items different from anything the user has seen before. At the same time a user should not be recommended items very similar to already seen choices. How to measure and improve diversity of recommendations?

Cold start problem: - The user has to rate a sufficient number of items before a content-based recommender system can really understand the user’s preferences and present the user with reliable recommendations.

Item-based algorithms can provide better computational performance than traditional user-based collaborative methods while, at the same time, providing comparable or better quality than the best available user-based algorithms. Model based methods outperform memory- based approaches in terms of accuracy of recommendations.

Hybrid RecSys: - Collaboration via content: - Based on traditional collaborative techniques but also maintain the content-based profiles for each item. These content-based profiles, and not the commonly rated items, are then used to calculate the similarity between two items.

**Trust Aware Recommender Systems**: -

Tackles the problem of cold start. Users with one expressed trust statement can benefit from the ratings provided by their trusted users and users trusted by them. As local trust metric MoleTrust is chosen in the paper, a depth-first graph walking algorithm with a tunable trust propagation horizon that allows one to control the distance to which trust is propagated. As global trust metric PageRank is chosen, which reduced the model accuracy. The final similarity of items is calculated using weighted average of Trust weights and cosine similarity. Let’s call this model CF+MTx. X is the depth of the trust network considered. It is seen that the Mean Absolute Error is less than only CF(collaborative filtering) and more than only MTx. Coverage of predictions is increased through use of trust metrics.

**Performance of Recommender Systems on TopN recommender tasks**: -

In this paper, two accuracy metrics are proposed for measuring the performance of a TopN recommender. Recall(N) = #hits/#users and precision(N) = Recall(N)/N. Several Algorithms like Pearson Neighbor, Cosine Neighbor, AsySVD, SVD++, PureSVD are studied with respect to Recall and Precision for both head and long tail. It is observed that PureSVD although having greater RMSE outperforms SVD++ and other algorithms in terms of Recall and Precision. PureSVD gives good predictions on long tail as well apart from Pearson Neighbor which also does well on long tails.