Wyatt Blair

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**Class 7 -A Survey of Collaborative Filtering Techniques**

This paper describes several different methods an engineer could use to approach a recommendation problem. First, the authors examine some of the known problems in the field; namely, data sparsity, scalability, synonymy, gray sheep and shilling attacks. The authors go on to describe the underlying mathematical mechanisms of the a memory-based collaborative filtering technique called Singular Value Decomposition (SVD). SVD uses cosine-similarity to assess which users are similar to one another. Once similar users are found, items which were rated highly by one user which another has not seen yet can be considered a good recommendation for that user. Someone creating a recommendation system can choose the similarity metric and recommendation mechanism which works best for their particular use case.

Another approach is to use model-based collaborative filtering. Simple Bayesian, Clustering, and Latent Semantic models are all used in the effort of predicting whether a user would or would not like a particular product. Some collaborative filtering techniques combine both memory-based and model-based techniques into hybrid collaborative filtering techniques. Which technique is most appropriate for the engineer’s system can be evaluated using evaluation metrics such as root mean square error (RMSE), mean absolute error (MAE), normalized mean absolute error (NMAE), and ROC sensitivity,