Method of taking disagreement into account in group evaluation with variance

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November 17, 2021

Method

The method we chose to use for evaluating disagreement in the review is one of the methods presented in (Amer-Yahia et al. 2009). Method is based on the idea that high variance in ratings given to an item amongst a group indicates that the item in question is not relevant to the group.

Disagreement function

First we need to calculate disagreement variance for the item i in the group g.

$$dis(g,i) = \frac{1}{|g|} \sum_{u \in g} (r^*(u,i) - mean)^2$$

where $r^*(u,i)$ is the rating given by user u to item i and $mean$ is the mean of ratings given by the group to item i.

Consensus function

The disagreement is then taken into account with a consensus function. Consensus balances the groups aggregation score with the disagreement score with weights w_1 and w_2.

$$con(g, i) = w_1 \times r^*(g, i) + w_2 \times (1 - dis(g, i))$$

where $w_1 + w_2 = 1$ and r^* is the average aggregation function.

References

 Amer-Yahia, Sihem et al. (2009). "Group recommendation: semantics and efficiency". eng. In: *Proceedings of the VLDB Endowment* 2.1, pp. 754–765. ISSN: 2150-8097.