

The development of the recommendation system we have been working on in the past weeks has come to an end. Now, our recommendation system offers us 5 products "described as data similar to that product" based on the data described as "the product received". At this stage, we wanted to go one step above this stage and wanted to take a realistic approach to our project by creating a scenario. At this stage, in a paper we reviewed in the literature, imputation strategies were developed to estimate missing data by using user demographic information (age range, occupation) for scoring data. These strategies aim to fill in the missing data by using the average scores of other users with similar demographic characteristics. This approach has been found to provide more than 10% improvement in making better predictions compared to traditional collaborative filtering methods. [1] In another paper we reviewed, [2] a missing data filling strategy for rating data was investigated. In particular, the problem of data sparsity in collaborative filtering algorithms used for recommender systems is addressed and a new collaborative filtering framework for missing data filling is proposed. This framework proposes an imputation strategy using item type information. In general, missing data filling is referred to as imputation in the literature. This technique gives us the idea of generating information that is not present in our dataset. Thus, the recommended products are randomly assigned as received and liked (1), received and disliked (0), and not received (None). Based on this information, the success of the model was measured by what percentage of the recommended products were received and liked by the customers. The result of this measurement was 24,86% for the notebook [3] studied this week. We also added the recommendation system we prepared with the KNN algorithm after PCA, which we forgot to do in the previous weeks. As a result, we think we have designed a product recommendation system that can give a better recommendation by not using PCA. We also state that by adding scenario, we make our work more understandable.

## References

- [1] W. Xia, L. He, J. Gu and K. He, "Effective Collaborative Filtering Approaches Based on Missing Data Imputation," 2009 Fifth International Joint Conference on INC, IMS and IDC, Seoul, Korea (South), 2009, pp. 534-537, doi: 10.1109/NCM.2009.128.
- [2] Weiwei Xia, Liang He, Junzhong Gu, Keqin He and Lei Ren, "Boosting collaborative filtering based on missing data imputation using item's genre information," 2009 2nd IEEE International Conference on Computer Science and Information Technology, Beijing, 2009, pp. 332-336, doi: 10.1109/ICCSIT.2009.5234936.
- [3] <https://github.com/ogulcanakcaa/Fashion-Recommendation-System/blob/main/Codes/pca-knn-vgg16%20version%203.ipynb>