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Neighbor selection for cold users in collaborative filtering with positive-only feedback*

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Abstract—Recommender systems heavily rely on the availability of historical user preference data, struggling to provide relevant suggestions for new users. The cold start user scenario is thus recognized as one of the most challenging problems in the recommender systems research area. Previous work has focused on exploiting additional information about users and items –e.g., user personality and item metadata– to mitigate the lack of user feedback. However, it is still unclear how to approach the worst scenario where no side information is available to a recommender system. Addressing this problem, in this paper we focus on new users of memory-based collaborative filtering methods with positive-only feedback, and conduct a comprehensive study of a number of neighbor selection strategies. Specifically, we present empirical results on several datasets analyzing the effects of choosing adequately the user similarity, the set of candidate neighbors, and the size of the user neighborhoods. In particular, we show that even few but reliable neighbors lead to better recommendations than large neighborhoods where cold start users belong to.

Index Terms—recommender systems, collaborative filtering, cold start, neighbor selection



PMSC-UGR: A test collection for expert recommendation based on PubMed and Scopus*

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Abstract—A new test document collection, PMSC-UGR, is presented in this paper. It has been built using a large subset of MEDLINE/PubMed scientific articles, which have been subjected to a disambiguation process to identify unequivocally who are their authors (using ORCID). The collection has also been completed by adding citations to these articles available through Scopus/Elsevier’s API. Although this test collection can be used for different purposes, we focus here on its use for expert recommendation and document filtering, reporting some preliminary experiments and their results.

Index Terms—Test collection, Authors disambiguation, Expert finding, Document filtering, MEDLINE/PubMed, Scopus



An Intelligent Advisor for City Traffic Policies*

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Abstract—Nowadays, city streets are populated not only by private vehicles but also by public transport, fleets of workers, and deliveries. Since each vehicle class has a maximum cargo capacity, we study in this article how authorities could improve the road traffic by endorsing long term policies to change the different vehicle proportions: sedans, minivans, full size vans, trucks, and motorbikes, without losing the ability of moving cargo throughout the city. We have performed our study in a realistic scenario (map, road traffic characteristics, and number of vehicles) of the city of Malaga and captured the many details into the SUMO microsimulator. After analyzing the relationship between travel times, emissions, and fuel consumption, we have defined a multiobjective optimization problem to be solved, so as to minimize these city metrics. Our results provide a scientific evidence that we can improve the delivery of goods in the city by reducing the number of heavy duty vehicles and fostering the use of vans instead.

Index Terms—Application, evolutionary algorithm, road traffic, city policy, real world, smart mobility