Ph.D. in Information Technology
Thesis Defense

January 13, 2023
at 10:30
Room Seminari "Nicola Schiavoni"

Cesare BERNARDIS – XXXIV Cycle

ON THE EFFECTIVENESS OF NEIGHBORHOOD-BASED MODELS IN RECOMMENDER SYSTEMS

Supervisor: Prof. **Paolo Cremonesi**

Abstract:

Neighborhood-based (NB) models are one of the most important milestones in the Recommender Systems literature. These models present valuable properties like simplicity, justifiability, stability, and generalization capability that can be rarely found in other techniques.

Nevertheless, in the last few years, the research interest moved toward more promising and complex techniques belonging to the Machine Learning (ML) sphere.

The goal of this thesis is to show that NB and ML are not alternative methodologies, but they represent complementary components of a successful system.

We prove that it is possible to use ML to compute a new user-level confidence index for item-based methods that can be exploited to provide precise recommendations.

We demonstrate how to double the stability of Matrix Factorization algorithms exploiting neighborhood information extracted through NB techniques, enhancing the final accuracy of the MF models.

Finally, we propose two new approaches for item cold-start recommendation that extract collaborative information from item similarities computed with NB algorithms, improving up to 20% the recommendation accuracy.

PhD Committee
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