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Optimization under uncertainty for recommendation system design

Abstract:

Recommendation systems explore an exponentially-large search space to identify the favourite solution of the user.

The exploration is usually guided by the user preferences. However, at the beginning of the search process, the user preferences are usually unknown and need to be learnt by interacting with the user during the search for his favourite solution.

In particular, the search for the user favourite solution can be formalized as an optimization-under-uncertainty task, where the objective function of the optimization problem represents the user utility model and cannot be fully defined at the beginning of the solution process. The missing information, necessary to guide the search towards the global optimum, is elicited from the user. However, assuming accurate and consistent user feedback is impractical, due to the limited information-processing capabilities and the bounded rationality of the humans when making decisions. This talk presents and discusses a robust approach to reason with partial and inaccurate user utility models.