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Report on Alexandra Burashnikova PhD Thesis entitled
`` Large-Scale Sequential Learning for Recommender and Engineering Systems''

In the given Thesis the problem of constructing efficient learning algorithms based on sequential observations, especially in the cased of recommender systems, is thoroughly considered. The Thesis consists of two parts, where the first part gives the state of the art of considering problems and prepares the reader to the main part of the Thesis, namely, chapters 4-6. Conclusion and direction for future research are given in Chapter 7.

Let me start from chapter 4 since previous chapters despite their importance for the Thesis in whole does not contain new results. This chapter deals with recommender systems which are based on implicit feedback, not as initial such systems which involved some score systems. Nowadays systems based mainly on clicks and A. Burashnikova proposed to consider the correspondent sequences of clicks as consecutive ``blocks'', where every block consists of a sequence of unclicked items followed by a clicked one. If one interprets clicked item as 1 and unclicked as 0, then it is the well-known (and natural) representation of any binary sequence. Alexandra developed a very interesting algorithm, which she called SAROS, and scrupulously analyzed it. In particular, Alexandra compared her algorithm with previously known and shown advantage of her own approach, see Table 4.6. of the Thesis.

Chapter 5 devoted to development of two variants of SAROS algorithm which should provide robustness. Of course, it is very important for practice to have algorithms which are not very sensitive to different type of errors, especially, adversarial ones. The result of this chapter were presented very recently at 44th European Conference on Information Retrieval, and also published in Journal of AI Research.

In chapter 6 the author shows some universality of developed technique and apply it for very important application, namely, faulted lines detection in electric grids. The underline idea – to use topology of a grid, is very popular in ANN now. Despite that in the considered case not much topology is used.

This Thesis combines theoretical considerations, like study of the problem of convergence in Chapter 4, with sufficient attention to applications. All results are correct and were well approbated via journal publications and conference presentations. Based on the aforementioned I would like strongly recommend to defend Alexandra Burashnikova Thesis as it is.

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