Annales Mathematicae et Informaticae
Manuscript

Proceedings of the
1th International Conference and Exhibition on Future RFID Technologies
Eszterházy Károly College and Bay Zoltán Nonprofit Ltd. for Applied Research
Eger, Hungary, November 5–7, 2014

Extending the Rash model to a multiclass parametric network model*

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Abstract

The newly introduced α-β-models [1] and the classical Rash model [2] are united in a semiparametric multiclass graph model. We give a classification of the nodes of an observed network so that the generated subgraphs and bipartite graphs of it obey these models, where their strongly connected parameters give multiscale evaluation of the nodes. This is a heterogeneous version of the stochastic block model, built via mixtures of loglinear models, the parameters of which are estimated by collaborative filtering [3]. In the context of social networks, the clusters can be identified with social groups and the parameters with attitudes of people of one group towards people of the other, which attitudes depend on the cluster memberships. The algorithm is applied to randomly generated and real-word data.

Keywords: Rasch model, multiclass loglinear models, collaborative filtering

MSC: 62F86, 62P25

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*Research supported by the TÁMOP-4.2.2.C-11/1/KONV-2012-0001 project.