

## عنوان مقاله:

Fuzzy Temporal Association Rule Mining from Dynamic Protein-Protein Interaction Network

## محل انتشار:

کنفرانس بین المللی پژوهش ها و فناوری های نوین در مهندسی برق (سال: 1401)

تعداد صفحات اصل مقاله: 6

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## خلاصه مقاله:

One of the basic concepts in the functioning of cells is the dynamics of PPI networks, the formation, merging and finding the temporal relationship between protein complexes. Converting PPI networks from static form to time graph form helps to understand their dynamics. To convert the PPI static graph into a dynamic graph, gene expression data is used according to the expression level. Gene expression samples were collected at different time points according to various conditions such as stress, adding the oxidant or adding galactose to the cell cultures. Therefore, biological knowledge extracted from dynamic networks will be affected by this temporal heterogeneity. In this article, a method for extracting fuzzy temporal association rules of reference protein complexes in dynamic PPI networks is presented. The generalized MCODE graph clustering algorithm is applied to dynamic networks to handle the volume of calculations and to reduce the number of data items. The identified clusters are considered reference protein complexes. Extracted clusters, at each time point, are fuzzified according to the reference protein complexes with different membership degrees. Rules will be extracted based on fuzzified reference protein complexes. By clustering and cluster fuzzifying, the volume of items in each transaction is reduced from the graph size to the number of protein complexes. The numbers of extracted rules from YeastNet datasets is, ۹۵۷, with support ۰.۱ and confidence ۰.۱۵. Also, the evaluation of multidimensional rules at different times, extracted with the proposed algorithm, using EBI data emerged informative results.

## کلمات کلیدی:

Inter-transaction rules, Protein-Protein Interaction Network, fuzzy temporal association rule, graph mining

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1644786>

