

Review on network motifs detection and its applications

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1. Background

Network motifs are defined as recurrent and statistically significant sub-graphs or patterns, which assists researchers in the identification of functional units in the networks including biological networks, social networks, technological networks (e.g., computer networks and electrical circuits), World Wide Web and more. However, their detection is computationally challenging. Several algorithms have been introduced to resolve this computationally hard problem. These algorithm can be classified under various paradigms such as exact counting methods, sampling methods, pattern growth methods and so on.

2. Objective

In this project, we will take a review about the current network motifs detection algorithms and analyze the algorithms' complexity and their advantages and disadvantages. Meanwhile we'll summarize their current applications in social network and biological network and their remaining challenging issues.

3. Workflow

- **Study papers about all current motifs detection algorithm, focus on the following questions:**
 - What are the motifs patterns with regarding to different number of vertices?
 - How does the algorithm work? Are there any assumptions or restrictions?
 - What's the complexity? Comparison among all algorithms?
- **Implement the top algorithms using the yeast gene regulatory biology network data to verify the result**

4. References

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