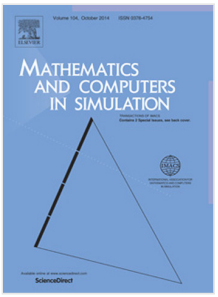

Making all spanning tree problem based on sticker model

Zhou Kang, Huang Yufang, Cheng Zhen, Dong Yafei

PII: S0378-4754(17)30088-5
DOI: http://dx.doi.org/10.1016/j.matcom.2017.04.002
Reference: MATCOM 4449

To appear in: *Mathematics and Computers in Simulation*

Received date: 11 November 2009
Accepted date: 3 April 2017

Please cite this article as: Z. Kang, H. Yufang, C. Zhen, D. Yafei, Making all spanning tree problem based on sticker model, Math. Comput. Simulation (2017), http://dx.doi.org/10.1016/j.matcom.2017.04.002

Making all spanning tree problem based on sticker model

Zhou Kang [a,*], Huang Yufang [b], Cheng Zhen [b], Dong Yafei [c]

[a] *Department of Mathematics and Physics, Wuhan Hubei Polytechnic University, 430023, Wuhan Hubei, China*

[b] *Department of Control Science and Engineering, Huazhong University of Science and Technology, 430074, Wuhan Hubei, China*

[c] *College of Life Sciences, Shaanxi Normal University, 71006, Xian Shaanxi, China*

Abstract

The composition of sticker model is discussed. In order to improve the successful rate of separation experiment, DNA strand is used as memory strand and separation probe and PNA strand is used as sticker strand. Fundamental biochemistry experiments of sticker model and their realization process are analyzed. Based on separation technology and electrophoresis experiment, a new detection experiment is put forward, which can be used to detect several kinds of memory complex. DNA algorithm of making all spanning tree problem and its biochemical realization process are put forward, first the initial solution space of spanning subgraph is created, then all spanning trees are selected from the initial solution space. During the creating solution space of spanning subgraph, complete hybridization based on incomplete separation is first put forward, which can separate equably one tube into several tubes according to the requirement of algorithm design. The correctness and complexity of the DNA algorithm are discussed and proved. Finally, the feasibility and validity of the DNA algorithm are explained by a simulate experiment. Two kinds of biotechnology are first put forward, which are detection experiment based on separation technology and complete hybridization based on incomplete separation, and DNA algorithm of making all spanning tree problem is also first put forward.

Key words: sticker model, making all spanning tree problem, detection experiment based on separation technology, complete hybridization of incomplete separation