容錯式煎餅圖中漢米爾頓性質之研究

梁高源、洪春男

E-mail: 9206926@mail.dyu.edu.tw

摘 要

環狀網路是分散性系統與連結網路中基本的拓撲結構，當連結網路上的處理器增加、處理器之間的連線也增加時，出現某些處理器或連線故障的機會就會相對增加，因此容錯性質的研究就成為一個重要的研究主題。 在此論文中，我們將針對煎餅圖的容錯性質做研究，假設在煎餅圖中壞掉的點與邊的個數為F。首先證明當F ? k 時，在圖中還含有一個漢米爾頓迴圈，則煎餅圖是一個具有k-漢米爾頓性質的圖形。接下來當煎餅圖中F ? k時，在圖形中任兩點間含有一條漢米爾頓路徑，則煎餅圖具有k漢米爾頓連通的性質。 我們最後還證明煎餅圖是一個具有強的k-漢米爾頓性質的圖形，也就是說圖形中的任一點至少具有k+2-|F|條鄰邊且任兩條鄰邊皆會在漢米爾頓迴圈上。

關鍵詞 : 煎餅圖 ; 容錯性質 ; 連結網路 ; k-漢米爾頓 ; k漢米爾頓連通 ; 強的k-漢米爾頓

目錄

參考文獻

[1] S. B. Akers, and B. Krishnamurthy. A group theoretic model for symmetric inter-connection networks, IEEE Trans, Computer, 4(C-38), pp.555-566,.1989.

[2] S. B. Akers, D. Harel, and B. Krishnamurthy, The star graph : An attractive alernative to the n-cube, Proe. International Conference on Parallel Processing, St. Charles, Iiinois, pp. 393-400, 1987.

[3] F. Berman and L. Snyder. On mapping parallel algorithms into parallel architectures, J. Parallel and Distributed Computing, vol.4, pp. 139-158, 1987.

[4] S. Bokhari, On the mapping problem, IEEE Trans. on Computers, vol.30, pp. 207-214, 1981.

[5] W. C. Fang, C. C. Hsu, On the fault-tolerant embedding of complete binary trees in the pancake graph interconnection network, Information Sciences 126, pp. 191-204, 2001.

[6] S. Y. Hsieh and G. H. Chen, Hamiltonian—laceability of star graphs, Proc. Internet. Symp. On Parallel Architecture Algorithms and Networks, pp. 112-117, 1997.

[7] S.Y Hsieh, G. H. Chen and C.W Ho, Longest fault-free paths in star graphs with vertex faults, Theoretical Computer Science 262, pp. 215-227, 2001.

[8] A. Kancvsky and C. Feng, On the embedding of cycles in pancake graphs, Parallel Computing, 2, pp. 923-936, 1995.

[9] S. Latifi and N. Bagherzadeh, Hamiltonicity of the clustered-star graph with embedding applications, Proc. Inernat. Conf. on Parallel and Distributed Processing Techniques and Applications, pp. 734-744, 1996.

[10] F. T. Leighton, Introduction to parallel algorithms and architectures arrays tree hypercubes, Morgan Kaufmann Publisher, INC, 1992.

[11] A. Menn and A. K. Somani, An efficient sorting algorithm for the star graph interconnection, Proc.19th Int, Conf. on Parallel Processing, pp. 1-8, 1990.

[12] K. Qiu, The star and pancake interconnection networks properties and algorithms, PhD thesis, Queen`s University, Kingston Ontario, Canada, August 1992.

[13] K. Qiu, S. G. Akl, and H. Meijer, On some properties and algorithms for the star and pancake interconnection networks, Journal of Parallel and Distributed Computing 22, pp. 16-25, 1991.

[14] K. Qiu, S. G. Akl and I. Stojmenovie, Data communication and computational geometry on the the star and pancake interconnection networks, Proc.3rd IEEE Symp. on Parallel and Distributed Processing, pp. 415-422, 1991.

[15] H. Senoussi and C. Lavault, Embeddings into the pancake interconnection network, High Performance Computing on the Information Superhighway, HPC Asia ’97, pp. 73-78, 1997.

[16] A. S. Tanenbamm, Computer Networks (Prentice-Hall), 1996.
[17] Y. C. Tseng, S. H. Chang and J. P. Sheu, Fault-tolerant, ring embedding in a star graph with both link and node failures, IEEE Trans. Parallel Distrib. Systems 8 (12), pp. 1185-1195, 1997.