

Edge Fault-tolerant Hamiltonian Laceability of Bipartite Hypercube-like Networks

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ABSTRACT

The edge fault tolerance for Hamiltonian properties of n-dimensional bipartite hypercube-like graphs X_n are explored. The main result of this thesis is that $X_n - F$ is Hamiltonian laceable where F is the faulty edge set with $|F| = n-2$, and hyper-Hamiltonian laceable with $|F| = n-3$.

Keywords : hypercube-like, Hamiltonian laceable,hyper-Hamiltonian laceable, fault-tolerant.

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REFERENCES

- [1]. L. N. Bhuyan and D. P. Agrawal, Generalized hypercube and hypercubes structures for a computer network, IEEE Trans. Comput, vol. C-33, (1984) pp. 323-333.
- [2]. R. Balakrishnan, K. Ranganathan, A Textbook of Graph Theory.
- [3]. C. C. Chen, C. N. Hung, K. C. Hu, Edge Fault-tolerant of k^* -bifanability for bipartite Hypercube-like graphs, Workshop on Combinatorial Mathematics and Computational Theory, 22 (2005), pp. 134-139.
- [4]. Shou-Yi Cheng, Jen-Hui Chuang, Varietal Hypercube – A New Interconnection Network Topology for Large Scale Multicomputer, IEEE (1994) pp. 0-8186-6555-6.
- [5]. Jianxi Fan, Xiaola Lin, Xiaohua Jia, Node-Pancyclicity and edge-pancyclicity of crossed cubes, Information Processing Letter 93 (2005) pp. 133-138.
- [6]. P. Cull, S.M. Larson, On generalized twisted cubes, Inform. Process. Lett. 55 (1) (July 1995) pp. 53-55.
- [7]. R.K. Das, K. Mukhopadhyaya, B.P. Sinha, A new family of bridged and twisted hypercubes, IEEE Trans. Computers. 43 (10) (October 1994) 1240-1247.
- [8]. K. Efe, A variation on the hypercube with lower diameter, IEEE Trans. On Computers 40(1991), pp. 1312-1316.
- [9]. K. Efe, The crossed cube architecture for parallel computing, IEEE Trans. Parallel Distrib. Syst(1992), pp. 513-524.
- [10]. K. Efe, P.K. Blackwell, W. Slough, T. Shiau, Topological properties of the crossed cube architecture, Parallel Comput. 20 (12) (December 1994) 1763-1775.
- [11]. S. Gao, B. Novick and K. Qiu, From hall ' s matching theorem to optimal routing on hypercubes, Journal of Combinatorial Theory, Series B. 74(1998), pp. 291-301.
- [12]. C. N. Hung and K. C. Hu, Fault-tolerant Hamiltonian laceability of bipartite hypercube-like networks. Int. Computer Symposium, (Dec. 15-17, 2004), Taipei, Taiwan, pp.1145-1149.
- [13]. K. C. Hu and C. N. Hung, C. C. Chen, Edges fault-tolerant Hamiltonian laceability of bipartite hypercube-like networks,Workshop on Combinatorial Mathematics and Computational Theory, 22 (2005), pp.129-139.
- [14]. Sun-yuan Hsieh, Gen-Huey Chen, Chin-Wen Ho, Hamiltonian-Laceability of Star Graphs, IEEE (1997) pp.1087-4089.
- [15]. W. T. Huang, Y.C. Chung, J.M. Yan, L.H. Hsu, On the fault-tolerant hamiltonicity of faulty crossed cubes, IEICE Trans. Fundamentals (2002), pp. 1359-1370.

- [16]. F. T. Leighton, Parallel Algorithms and Architectures: Arrays, Trees and Hypercubes, Morgan Kaufmann, San Mateo, (1992).
- [17]. Tseng-Kuei Li, Chang-Hsiung Tsai, Jimmy J. M. Tan, Lih-Hsing Hsu, Bipanconnectivity and edge-fault-tolerant bipancyclicity of hypercubes, Information Processing Letter 87 (2003) pp. 107-110.
- [18]. Tseng-Kuei Li, Jimmy J. M. Tan, Lih-Hsing Hsu, Hyper Hamiltonian laceability on edge fault star graph, Information Sciences 165 (2004) pp.59-71.
- [19]. S. Latifi, S. Zheng, N. Bagherzadeh, Optimal ring embedding in hypercubes with faulty links, Fault-Tolerant Computing Symp.,(1992), pp. 178-184.
- [20]. S. Madhvapedy and I.H. Sudborough, A topological property of hypercubes: node disjoint paths, in Proc. of the 2th IEEE Symposium on Parallel and Distributed Processing SPDP (1990), pp. 532-539.
- [21]. Chong-Dae Park, Kyung-Yong Chwa, Hamiltonian properties on the class of hypercube-like networks, Information Processing Letters, 91 (2004), pp.11-17.
- [22]. J. H. Park, One-to-Many Disjoint Path Covers in a graph with Faulty Element, COCCON (2004), pp.329-401.
- [23]. J. H. Park, One-to-one Disjoint Path Covers in Recursive Circulants, Journal of KISS 30 (2003), pp.691-698.
- [24]. J. H. Park, H. C. Kim, H. S. Lim, Many-to-Many Disjoint Path Covers in a Graph with Faulty Elements, ISAAC (2004), LNCS 3341, pp. 742-753.
- [25]. Y. Saad and M.H. Schultz, Topological properties of hypercubes, IEEE Transactions on Computers, vol. 37, (July 1998), pp. 867-872.
- [26]. Chang-Hsiung Tsai, Jimmy J.M. Tan, Tyne Liang, Lih-Hsing Hsu, Fault-tolerant Hamiltonian laceability of hypercubes, Information Processing Letters, 83 (2002), pp. 301-306.
- [27]. A.S. Vaidya, P.S.N Rao, S.R. Shankar, A class of hypercube-like networks, in: Proc. Of the 5th Symp. On Parallel and Distributed Processing, IEEE Comput. Soc., Los Alamitos, CA, December (1993), pp. 800-803.