

# 二分-類-超立方體網路之可扇形化研究

陳嘉振、洪春男

E-mail: 9418563@mail.dyu.edu.tw

## 摘要

在本篇論文中，我們要介紹與研究super bifanability和fault tolerant bifanability的性質。我們將證明n-dimensional hypercube  $Q_n$ 和bipartite hypercube-like  $X_n$ 是f edges fault tolerant  $k^*$ -bifanable當 $n \geq 3, 0 \leq f \leq n-2, 1 \leq k \leq n-f$ 。另外，我們更進一步證明n-dimensional hypercube  $Q_n$ 在壞掉一點的情況下還是f edges fault tolerant  $k^*$ -bifanable當 $n \geq 3, 0 \leq f \leq n-3, k=n-f-1$ 。

關鍵詞：super bifanability fault tolerant bifanability hypercube bipartite hypercube-like

## 目錄

封面內頁 簽名頁 博碩士論文授權書.....	iv	中文摘要
要.....	v	ABSTRACT.....
錄.....	viii	圖目錄.....
and definitions .....	1	Chapter 1 Introductions
.....	Chapter 2 The edges fault tolerance bifanability of bipartite HL-graphs	
.....	5	Chapter 3 The edges fault tolerant bifanability with one faulty node of
hypercube graphs .....	19	3.1 The color of the faulty node and the source node are different
.....	19	3.2 The color of the faulty node and the source node are the same
.....	29	Chapter 4 Conclusions.....
References.....	37	36

## 參考文獻

- [1]. C.H. Chang, C.K. Lin, H.M. Huang, and L.H. Hsu, The super laceability of the hypercubes, Information Processing Letters 92 (2004), pp. 15-21.
- [2]. C.P. Chang, T.Y. Sung, L.H. Hsu, Edge congestion and topological properties of crossed cubes, IEEE Trans. Parallel Distrib. Syst (2000), pp. 64-80.
- [3]. F.B. Chedid, On the generalized twisted cube, Inform. Proc. Lett. 55 (1995), pp. 49-52.
- [4]. 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 [5]. K. Efe, A variation on the hypercube with lower diameter, IEEE Trans. on Computers 40 (1991), pp. 1312-1316.
- [6]. K. Efe, The crossed cube architecture for parallel computing, IEEE Trans. Parallel Distrib. Syst (1992), pp. 513-524 [7]. K. Efe, P.K. Blachwell, W. Slough, T. Shiau, Topological properties of the crossed cube architecture, Parallel Comput (1994), pp. 1763-1775 [8]. A.H. Esfahanian, L.M. Ni, and B.E. Sagan, The twisted n-cube with application to multi-processing, IEEE Trans. Computers 40 (1991), pp. 88-93.
- [9]. P.A.J. Hilbers, M.R.J. Koopman, J.L.A. van de Snepscheut, The Twisted Cube, in J. Bakker, A. Nijman, P. Treleaven, eds., PARLE: Parallel Architectures and Languages Europe, Vol. I: Parallel Architectures, Springer(1987), pp. 152-159.
- [10]. 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.129-133 [11]. W.T. Huang, Y.C. Chuang, J.M. Tan, L.H. Hsu, On the fault-tolerant hamiltonicity of faulty crossed cubes, IEICE Trans. Fundamentals (2002), pp. 1359-1370 [12]. C.N. Hung and K.C. Hu, Fault-tolerant Hamiltonian laceability of bipartite hypercube-like networks, The Proceedings of the 2004 International Computer Symposium (2004), pp. 1145-1149.
- [13]. P. Kulasinghe, S. Bettayeb, Embedding binary trees into crossed cubes, IEEE Trans. Comput (1995), pp. 923-929 [14]. S. Latifi, S. Zheng, N. Bagherzadeh, Optimal ring embedding in hypercubes with faulty links, Fault-Tolerant Computing Symp. (1992), pp. 178-184.
- [15]. F.T. Leighton, Parallel Algorithms and Architectures Arrays: Trees and Hypercubes, Morgan Kaufmann, San Mateo, (1992).
- [16]. S. Madhavapeddy 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.
- [17]. C.D. Park, K.Y. Chwa, Hamiltonian properties on the class of hypercube-like networks, Information Processing Letters, 91 (2004), pp. 11-17.
- [18]. J.H. Park, One-to-Many Disjoint Path Covers in a graph with Faulty Element, COCOON (2004), pp. 329-401.

- [19]. J.H. Park, One-to-one disjoint path covers in recursive circulants, *Journal of KISS* 30 (2003), pp. 691-698.
- [20]. A. Sengupta, On ring embedding in hypercubes with faulty nodes and links, *Inform. Proc. Lett.* 68(1998), pp. 207-214.
- [21]. C.H. Tsai, Linear array and ring embeddings in conditional faulty hypercubes, *Theoretical Computer Science* 314(2004), pp. 431-443.
- [22]. C.H. Tsai, J. J.M. Tan, T. Liang, L. H. Hsu, Fault-tolerant Hamiltonian laceability of hypercubes, *Information Processing Letters*, 83 (2002), pp. 301-306.
- [23]. A.S. Vaidya, P.S.N Rao, S.R. Shankar, A class of hypercube-like networks, *Proc. Of the 5th Symp. On Parallel and Distributed Processing*, IEEE Comput. Soc., Los Alamitos, CA(1993), pp. 800-803.
- [24]. M.C. Yang, T.K. Li, J.M. Tan, L.H Hsu, Fault-tolerant cycle-embedding of crossed cubes, *Inform. Process. Lett.* (2003), pp. 149-154.