以樣式技術為基礎之大學排課黑板系統

李杰濃、張顧耀

E-mail: 9509709@mail.dyu.edu.tw

摘 要

在校務行政上，排課一直都是無法避免的例行作業，由於必 須同時考慮許多因素與限制條件，使其成為十分複雜的問題；而 利用電腦來解決排課問題，雖已有許多方法被提出，但由於各校 系較無一致性的考量與標準，故目前尚未有可廣泛應用於各校系 之解決方案。 本論文針對各種影響排課之因素與限制進行分析，以樣式技 術為基礎，利用黑板架構來模擬實際人工排課的過程，並求得可 行之結果。同時，我們亦提出課表評量之方式，並以大葉大學資 訊工程學系為研究對象，實際比較本論文所提之方法與人工排課 結果之差異。

關鍵詞 : 排課系統、物件導向、樣式技術、黑板架構

目錄

參考文獻

[1]賴永進，1994，結合人工智慧技術與群體決策支援環境的 大專院校自動化排課系統－排課群體協商，大葉大學電機 工程研究所碩士論文。

[2]張獻文，1998，運用哈普費爾德－譚克類神經網路開發自 動化排課系統，大葉大學資訊管理研究所碩士論文。

[3]蘇家輝、林文揚，1999，“ 群體決策線上排課系統之建置 ”， 第五屆資訊管理研究暨實務研討會，台北。

[4]Abramson, D.,“ Constructing school timetables using simulated annealing: sequential and parallel algorithms, ” Management Science, Vol. 37, No. 1, 1991, pp. 98-113.

[5]Aust, R. J.,“ An improvement algorithm for school timetabling, ” The Computer Journal, Vol. 19, No. 4, 1976, pp. 339-343.

[6]Burke, E.K., Elliman, D.G. and weare, R.F.,“ A Hybrid Genetic Algorithm for Highly Constrained Timetabling Problems, ” Proceedings of the 6th International Conference on Genetic Algorithms, Pittsburgh, USA, 1995, pp.605-610.

[7]Burke E.K. and Petrovic S.,“ Recent research directions in automated timetabling, ” European Journal of Operational Research, Vol. 140, 2002, pp. 266-280.

[8]Cangalovic, M. and J. A. M. Schreuder,“ Exact coloring algorithm for weighted graphs applied to timetabling problems with lectures of different lengths, ” European Journal of Operational Research, Vol. 51, 1991, pp. 248-258.

[9]Chu, S. and Fang H.,“ Genetic algorithms vs. tabu search in timetable scheduling, ” Third International Conference on Knowledge-Based Intelligent Information Engineering Systems, Adelaide, Australia, 1999, pp. 492-495.

[10]Colorni, A., M. Dorigo and V. Maniezzo,“ Genetic algorithms and highly constrained problems: The timetable case, ” Proceedings of the First International workshop on Parallel Problem Solving from Nature, Dortmund, Germany, 1991, pp. 55-59.

[11]Eiself, H. and Laporte, G.“ Combinatorial Optimization Problems with Soft and Hard Requirements, ” Journal of the Operational Research Society, Vol. 38, 1987, pp. 785-795.

[12]Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides.（1995）Design Patterns: Elements of Reusable Object-Oriented Software, Addison wesley. ISBN: 0-201-63361-2.

[13]Even, S., A. Itai and A. Shamir, “ On the Complexity of Timetable and Multicommodity Flow Problem, ” SIAM J. Computing, 1976, pp.691-703.
[14]Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad and Michael Stal. （1996） Pattern-Oriented Software Architecture Volume 1:A System of Patterns. John wiley and Sons Ltd.. ISBN:0-471-95869-7.
[15]Gorodetski, Vladimir I. and Lebedev, A., “ Multi-Agent Technology for Planning,Scheduling and Resource Allocation, ” International Conference on Multi Agent Systems, Paris, France, 1998, pp. 429-430.
[16]Hertz, A., “ Tabu search for large scale timetabling problems, ” European Journal of Operational Research, Vol. 54, 1991, pp. 39-47.
[17]John M. Vlissides（2003）Data Access Patterns: Database Interactions in Object-Oriented Applications, Addison-wesley. ISBN:0-131-40157-2.
[18]Kingston, J. H and Yin-Sun Lynn, B. “ A software architecture for timetable construction, ” PATAT'00, Constance, Germany, August 2000, p472-480.
[19]Lawrie, N.L., “ An Integer Linear Programming Model of a School Timetabling Problem, ” The Computer Journal, Vol. 12, 1969, pp. 307-316.
[20]Schaerf, A., “ A Survey of automated timetabling, ” Artificial Intelligence Review, Vol. 13, No. 2, 1999, pp. 87-127.
[21]Slim Abdennadher and Michael Marte, “ University Course Timetabling Using Constraint Handling Rules, ” Applied Artificial Intelligence, Vol. 14, No. 4, 2000, pp. 311-325.
[22]Zervoudakis K. and Stamatopoulos P., “ A Generic Object-Oriented Constraint Based Model for University Course Timetabling ”, PATAT'00, Constance, Germany, August 2000, p128-147.