非等效平行機台之多階段流程型排程求解模式建構

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摘 要

本研究針對多階段平行機台流程式工廠的排程問題(Flow Shop with Multiple Processors；FSMP)，考量各階段中的平行機台可能因為其新、舊有加工效率上的差異為非等效平行機(unrelated parallel machine)，並且加入可分割整備(separable setup time)時間及加工順序相依(sequence dependent removal time)拆卸時間作為考量的因素，將工件安排至各階段的平行機台上加工，決定出加工順序，並以總流程時間最小化為目標，建構出其數學模式，以獲得最佳解，但有鑒於數學模式求解耗時，且僅適用於小規模問題，故針對較大規模問題，發展出一以模擬退火法為基礎之啟發式演算法，用以求解於中、大規模問題，以期可以在容許時間下搜尋到最佳解或一近似最佳解。

關鍵詞 : 非等效平行機 ; 獨立整備時間 ; 相依拆卸時間 ; 多階段平行機台

目錄

參考文獻

[1] 楊文華，「考慮設置時間下之相關排程問題研究」國立台灣工業技術學院，管理技術研究所博士論文，民國85年。
[2] 莊舜智，「多目標決策之應用—整備時間考量下之零工式程問題 探討」，大葉大學碩士學位論文，民國87年。
[3] 駱芳梧，「考量整備及拆卸時間之開放型工廠排程問題究」，大 葉大學碩士學位論文，民國91年。
[4] 張百棧，「基因演算法於非等效平行機台排程應用」，工業工程 學刊，19(2),79-95(2002)。
[5] 張毓仁，「多階段不等效平行機之排程研究」，中原大學碩士學位論文，民國89年。
[6] 田國興，「有設置時間之流程型工廠多階段平行機總排程時間最小化問題」，中原大學碩士學位論文民國88年。
[7] 柯惠雯，「結合模擬退火法與禁忌搜尋法在流程式生產排程之應用」，大葉大學碩士學位論文，民國90年。
[8] Adamopoullos, George.I., and Pappis, Costas.p.,“ Scheduling Under a common due-date on parallel unrelated machines ”,European Journal of Operational Research,105,pp494-501(1998).
[9] Alidaee, B., and Rosa, D.,”Scheduling parallel machines to minimize total weighted and unweighted tardiness ”,Computer and Operations,Research,Vol.24,No.8,pp775-788(1997).
[10] Allahverdi, Ali.,”Minimizing mean Flowtime in a two- machine Fowshop with Sequence-independent setup times ”,Computers and Operations Research,27,pp111-127(2000).
[11] Allahverdi, Ali., and Aldowaisan, Tariq.,” No-wait and separate setup three-machine Flowshop with total completion time Criterion ”,International Transcations in Opeartional Research,7,p p245-264(2000).
[12] Azizoglu, M., and Kirca, O.,“ Tardiness minimization on parallel machines ”,International Journal of Production Economic ,Vol.55,pp163-168(1998).
[13] Balakrishnan, Nagraj., and Kanet, John J.,”Early/tardy scheduling with sequence dependent setups on uniform parallel machines”,C-omputer and Operation Reasearch,26,pp127-141(1999).

[14] Brah, Shaukat.A., Loo, Luan.Luan., ” Heuristics for scheduling in a flow shop with multiple processors ” , European Journal of Operational Research,113, pp113-122(1999).
[15] Dessouky.Maged M.and Dessouky Mohamed I., ” Flow shop scheduling with identical jobs and uniform parallel machines “ ,European Journal of Operational Research,109,pp620-631(1998).
[16] Franca, Paulo.M., Gendreau, Michel., Laporte, Gilbert., ” A tabu search heuristic for the multiproces- sor scheduling problem with sequence dependent setup times ” ,International Journal of Production economics,43,pp79-89(1996).
[17] Gupta, S.K., ” N jobs and m machines job-shop problems with sequence-dependent set-up times “ ,Interntional Journal of Production Research,20(5),643-656(1982).
[18] Hiso, I., Shinta,M.,and Hideo, T., ” Modified simulated annealing algorithms for the flow shop sequencing problem ” ,European Journal of Operational Research, 81, 388-398(1995).
[19] Kim, Dong-WonKim,Kyong-HeeandJang,Wooseung., ” Unrelated parallel machine scheduling with setup times using simulated annealing ” ,Robotics and Computer Integrated Manufacturing, 18,pp223-231,(2002).
[20] Koulamas, Christos., Kyparisis,George J., ” Scheduling on uniform parallel machines to minimize maxi- mum lateness ” ,Operations ResearchLetters,Vol.26,pp175-179(2000) [21] Lee, Y.H., Bhaskaran, K., and Pinedo, M., ” A heuristic to minimize the total weighted tardiness with sequence dependent setups ” ,IIE Transactions, 29, 45-52(1997).
[22] Righini, Giovanni., ” A double annealing algorithm for discrete location/allocation problem ” ,European Journal of Operational Research,86,pp452-468(1995).
[23] Rubin, Paul.A., and Ragate, Gary.L., ” Scheduling in a sequence dependent setup environment with genetic search ” ,Computers and Operations Research,Vol.22,No.1,pp85-99(1995).
[24] Proust, C., Gupta, J.N.D., and Deschamps, V., ” Flowshop scheduling with set-up, processing and removal times separated ” ,International-Journal of Production Research, 29, 479-493(1991).
[25] Santos, D.L., Hunsucker, J.L., Deal,D.E., ” Global lower bounds for flow shop with multiple processors ” ,European Journal of Operational Research,80, pp112-120(1995).
[26] Santos D.L , Hunsucker J.L and DEAL D.E, ” An evaluation of sequencing heyristics in flow shops with multiple processors “ ,Computers ind.Engng,30(4),pp.681-692(1996).
[27] Sule, D.R., ” Sequencing n jobs on two machines separated ” ,Naval Research Logistics Quarterly, 29, 517-519(1982).
[28] Suresh, V., and Chaudhuri, Dipak., “ Bicriteria scheduling problem for unrelated parallel machines ” ,Computers and Operations Research,Vol.30,No.1,pp77-82(1996).
[29] Yoshida, T., and Hitomi, K., ” Optimal two-stage production scheduling with setup times separated ” ,AIIE Transactions, 11,261- 263(1979)