以液體震波管進行震波聚焦實驗(parti)、二維圓柱尾流實驗(partii)

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摘 要

單元製造系統，為群組技術(Group Technology)之應用，可簡化生產流程、降低整備時間、減少物料處理，減少品質問題等，達到降低成本之目的。而單元形成問題為單元製造系統中最重要的一環，國內外有許多學者對其加以探討，由於它具有NP-Complete特性，因此對於大型問題，欲在合理時間內求得最佳解相當困難，故一般皆以啟發式演算法來求得一近似解。 本研究針對兩類單元形成問題進行求解，一類為單元間零件流量最大化問題，另一類為考量多途程之單元形成問題，由於此兩類問題皆具有一般化指派問題(Generalized Assignment Problem, GAP)的特性，因此，本研究亦針對一般化指派問題發展演算法求解，並將其演算法架構應用於單元形成問題上。 於求解問題上，本研究採用兩種方法，一為禁忌搜尋法(Tabu Search)，加入「動態禁忌名單管理」及「應用長期記憶體資訊於加強化和多樣化策略」兩機制來改進傳統禁忌搜尋法之缺點，使得解品質能夠更進一步提升。另一為拉氏鬆弛演算法，利用拉氏鬆弛法(Lagrangian Relaxation)將模式簡化，並應用次梯度(Subgradient)方法發展演算法來求解。 研究結果發現，本研究所提出之禁忌搜尋法明顯優於傳統之禁忌搜尋法，且對於解品質之提升有相當效益；拉氏鬆弛演算法亦可獲得不錯之解。

關鍵詞 : 單元形成、一般化指派問題、多途程、禁忌搜尋法、長期記憶體、拉氏鬆弛法

目錄

參考文獻

參考文獻(第一部份) I. 1.吳龍男,梁勝明,尤方悉,"拋物面反射體上震波聚焦引起渦流現象之實驗及數值研究,"中國航空太 空學會學刊, VOL. 30, NO. 2, JUNE 1998, PP.109-118. I. 2.BAILITIS,E., DER SCHALLIMPULS EINES FLUSSIGKEITSFUNKENS.,"THE PRESSURE PULSE OF A LIQ -UID SPARK,"ZEITSCHRIFT FUR ANGEWANDTE PHYSIK EINSCHLIEbLCH NUKLEONIK 9:429-434; 1957. I. 3.HAUSLER, E., KIEFER, W., ANREGUNG VON STOSSWELLEN IN FLUSSIGKEITEN DURCH HOCHGESCHWIN -DIGKEITSWASSERTROPFEN. "GENERATION OF SHOCK WAVES IN LIQUIDS BY HIGH-VELOCITY WATER DROPS, "VERHANDLUNGEN DEUTSCHE PHYSIKALISCHE GESELLSCHAFT 6:786; 1970. I. 4.CHAUSSY, C., BRENDEL, W., SCHMIEDT, E.,"EXTRACORPOREALLY INDUCED DESTRUCTION OF KIDNE -Y STONES BY SHOCK WAVES ,"LANCET II: 1265-1268; 1980. I. 5.CHAUSSY, C., SCHMIEDT, E., JOCHAM, D., BRENDEL, W., FORSSMANN, B., WALTHER, W., "FIRS -T CLINICAL EXPERIENCE WITH EXTRACORPOREALLY INDUCED DESTRUCTION OF KIDNEY STONES BY SHOCK WAVES,"J. UROL. 127:417-420; 1982. I. 6.SIMON, J., CORBUSIER, A., MERDES, L. A.,"EXTRACORPOREAL SHOCK WAVE LITHOTRIPSY FOR UR -INARY STONE DISEASE,"EUR. UROL. 16:7-11; 1989. I. 7.OOSTERHOF, G. O. N., SMITS, G. A. H. J., DE RUYTER, J. E., VAN MOORSEAAR, R. J. A., S -CHALKEN, J. A., DEBRUYNE, F. M. J.,"THE IN VITRO EFFECT OF ELECTROMAGNETICALLY GENER -ATED SHOCK WAVES ON THE DUNNING R3327 PAT-2 RAT PROSTATIC CANCER CELL-LINE,"UROL. RE -S. 17:13-19; 1989. I. 8.RUSSO, P., STEPHENSON, R.A., MIES, C., HURYK, R., HESTON, W. D. W., MELAMED, M. R., F -AIR, W. R.,"HIGH ENERGY SHOCK WAVES SUPPRESS TUMOR GROWTH IN VITRO AND IN VIVO,"J. UROL. 135:626-628; 1986. I. 9.HOLMES, R. P., YEAMAN, L. I., LI, W. J., HART, L. J., WALLEN, C. A., WOOKRUFF, R. D., MCCULLOUGHM D. L.,"THE COMBINED EFFECTS OF SHOCK WAVES AND CISPLATIN THERAPY ON RAT PROSTATE TUMORS,"J. UROL. 144:159-163; 1990. I.10.BRAUN, W., CLAES, L., RUTER, A., PASCHKE, D.,"EFFECTS OF EXTRACORPOREAL SHOCK WAVES ON THE STABILITY OF THE INTERFACE

BETWEEN BONE AND POLYNETHYLMETHACRYLATE : AN IN VI -TRO STUDY ON HUMAN FEMORAL SEGMENTS,"CLIN BIOMECH. 7:47-54; 1992. I.11.WEINSTEINM J. N., OSTER, D. M., PARK, J.B., PARK, S. H., LOENING, S.,"THE EFFECT OF THE EXTRACORPOREAL SHOCK WAVE LITHOTRIPTOR ON THE BONE-CEMENT INTERFACE IN DOGS,"CLIN ORTHOP. REL. RES. 235:261-267; 1988. I.12.VALCHANOU, V. D., MICHAILOV, P.,"HIGH ENERGY SHOCK WAVES IN THE TREATMENT OF DELAYED AND NONUNION OF FRACTURES,"INTERN. ORTHOP. 15:181-184; 1991. I.13.SCHLEBERGER, R., SENGE, T.,"NONINVASIVE TREATMENT OF LONG-BONE PSEUDARTHROSIS BY SHOC -K WAVES(ESWL),"ARCH. ORTHOP. TRAUMA SURG. 111:224-227; 1992. I.14.STURTEVANT, B. AND KULKARNY,V. A.,"THE FOCUSING OF WEAK SHOCK WAVES," J. FLUID MECH., VOL. 73, PP. 654-671, 1976. I.15.GRONG, H.,"SHOCK WAVE FOCUSING PHENOMENA,"PROCEEDING OF THE 15TH INTERNATIONAL SYMPOS -IUM ON SHOCK WAVES AND SHOCK TUBES, JULY28-AUGUST2, ED. K. TAKAYAMA, VOL. I, PP.43- 56,1985. I.16.TAKAYAMA, K. AND BEN-DOR, G., "REFLECTION AND DIFFRACTION OF SHOCK WAVES OVER A CIRCU -LAR CONCAVE WALL,"REPRINT FROM THE REPORTS OF THE INSTITUTE OF HIGH SPEED MECHANICS, TOHOKU UNIV., SENDAI, JAPAN, VOL. 51,1986. I.17.LIANG, S. M., WU, C. S., YU, F. M. AND WU, L. N.,"NUMERICAL SIMULATION OF SHOCK WA -VE FOCUSING OVER PARABOLIC REFLECTORS,"SHOCK WAVES , VOL. 5, PP. 139-148,1995. I.18.COLMAN, A. J., SAUNDERS, J. E., CRUM, L. A. AND DYSON, M.,"ACOUSTIC CAVITATION GENERA -TED BY AN EXTRACORPOREAL SHOCK WAVE LITHOTRIPTER,"ULTRASOUND IN MEDICINE AND BIOLOG -Y, VOL. 13, NO.2, 1987. I.19.SOMMERFELD, M. AND MULLER, H. M.,"EXPERIMENTAL AND NUMERICAL STUDIES OF SHOCK WAVE FO -CUSING IN WATER,"EXPERIMENTS IN FLUIDS, VOL.6, PP. 209-216,1993. I.20.TOMITA, Y.,OBARA, T., TAKAYAMA,K. AND KUWAHARA,M., "CAVITATION PHENOMENA IN EXTRACORP -OREAL MICROEXPLOSION LITHOTRIPSY,"SHOCK WAVES,VOL.3,PP.149-157,1994 I.21.ISUZUGAWA, K. AND HORIUCHI, M.,"EXPERIMENTAL AND NUMERICAL STUDIES OF BLAST WAVE FO -CUSING IN WATER,"PROC.18TH INT. SYMP. ON SHOCK WAVES, VOL. 17, NO. 6, JUNE 1974. I.22.DELIUS, M.,"MEDICAL APPLICATION AND BIOEFFECTS OF EXTRACORPOREAL SHOCK WAVES,"SHOCK WAVES, PP.55-72, APR. 1994. I.23.DELACRETAZ, G., RINK, K.,PITTOMVILS, G., LAFAUT, J. P., VANDEURSEN, H. AND BOVING, R. ,"IMPROTANCE OF THE IMPLOSION OF ESWL INDUCED CAVITATION BUBBLES," ULTRASOUND IN MEDI -CINE AND BIOLOGY, VOL. 21, NO.1, PP.97-103, 1995. I.24.SMITH,ARTHUR D.,ET AL., "SMITH'S TEXTBOOK OF ENDOUROLOGY ," QUALITY MEDICAL PUBLISHIN -G, INC. PP.530-552, 1996. I.25.HOWARD, D.,"MECHANISMS OF INJURY ASSOCIATED WITH EXTRACORPOREAL SHOCK WAVE LITHOTRIPS -Y,"PH.D. THESIS, CALIFORNIA INSTITUTE OF TECHNOLOGY, LA., 1996. I.26.王璽, "在真實氣體效應中非穩態震波繞射問題之數值研究,"國立成功大學碩士論文,1992. I.27.吳秋山,"數值模擬二維震波反射聚焦之過程與流場分析,"國立成功大學碩士論文,1994. I.28.陳冠中,"數值模擬水中震波聚焦之現象,"國立成功學碩士論文,1996. I.29.陳俊宇,"電腦模擬輔助設計體外震波碎石機之反射體,"國立成功學碩士論文,1997. I.30.陳驊,"高解析度加權基本不震盪法模擬水中震波聚焦,"國立成功學碩士論文,1998. I.31.KOSING, O. E., SKEWS, B. W.,"THE USE OF LIQUID SHOCK WAVES FOR METAL FORMING,"ISSW21. PAPER 5289, JULY 1997. I.32.B.J.P. MORTIMER, B.W. SKEWS, L.T. FELTHUN "THE USE OF A SLOW SOUND SPEED FLUOROCARBON LIQUID FOR SHOCK WAVE RESERRCH," SHOCK WAVES 8: 63-69, 1998. I.33.T.G. MUIR, E.L. CARSTENSEN"PREDICTION OF NONLINEAR ACOUSTIC EFFECTS AT BIOMEDICAL FRE -QUENCIES AND INTENSITIES," ULTRASOUND IN MED. AND BIOL. 6: 345-357 1980. I.34.莊志賢,"圓形震波管系統之研製,"碩士論文,大葉大學碩士論文, 1997. I.35.K.IZUMI, S. ASO, AND M. NISHIDA "EXPERIMENTAL AND COMPUTATIONAL STUDIES FOCUSING PROC -ESSES OF SHOCK WAVES REFLECTED PARABOLIC REFLECTORS,"SHOCK WAVES, 3:213-222, 1994. I.36.JG. KIRKWOOD, H. BETHE, E. MONTROLL, JM. RICHARDSON,"THE PRESSURE WAVE PRODUCED BY AN UNDERWATER EXPLOSION," OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT, OSRD REPORTS I (NO.588), II (NO.676), III (NO.813). 1942. I.37.R. HOLL "WELLENFOKUSSIERUNG IN FLUIDEN. DISSERTATION,"RWTH AACHEN, GERMANY. 1982. I.38.M. MULLER "STOSSWELLENFOKUSSIERUNG IN WASSER. DISSERTATION," RWTH AACHEN, GERMANY.198 7. 參考文獻(第二部分) Ⅱ. 1.D. BARKLEY AND R. D. HENDERSON,"THREE-DIMENSIONAL FLOQUET STABILITY ANALYSIS OF THE WAKE OF A CIRCULAR CYLINDER,"J. FLUID MECH., 322, 215, 1996. Ⅱ. 2.JACKSON, C.P.,"A FINITE-ELEMENT STUDY OF THE ONSET OF VORTEX SHEDDING IN FLOW PAST VARIOUSLY SHAPED BODIES, "J. FLUID MECH. 182, 23, 1987. Ⅱ. 3.C. MATHIS, M. PROVANSAL, AND L. BOYER,"BENARD-VON KARMAN INSTABILITY: TRANSIENT AND FORCED REGIMES,"J. FLUID MECH. 182, 1, 1987. Ⅱ. 4.A. ROSHKO,"ON THE DEVELOPMENT OF TURBULENT WAKES FROM VORTEX STREETS," NACA REPORT 1191, 1954. Ⅱ. 5.C.H. K. WILLIAMSON,"VORTEX DYNAMICS IN THE CYLINDER WAKE,"ANNU. REV. FLUID. MECH., 28, 477, 1996. Ⅱ. 6.林子堯,"肥皂膜水洞之研製暨其應用於二維正交平板流之研究, "碩士論文,大葉大學,1997. Ⅱ. 7.莊志賢,"垂直連續式肥皂膜水洞之研製與二維流實驗(PART I)圓形震波管系統之研製(PART II), "碩士論文,大葉大學,1997. Ⅱ. 8.Y. COUDER,"TWO-DIMENSIONAL GRID TURBULENCE IN A THIN LIQUID FILM, "J. PHYS. LETT. 45 , 353, 1984. Ⅱ. 9.M. GHARIB AND P. DERANGO,"A LIQUID FILM (SOAP FILM) TUNNEL TO STUDY TWO-DIMENSIONALT -OISUNAR AND TURBULENT SHEAR FLOWS, "PHYSICA D 37,406, 1989. Ⅱ.10.HAMMACHE, M. AND GHARIB, M.,"AN EXPERIMENTAL STUDY OF THE PARALLEL AND OBLIQUE VORTE -X SHEDDING FROM CIRCULAR CYLINDER, " J. FLUID MECH. 232, 567, 1991. Ⅱ.11.H. KELLAY, X. L. WU, AND W. GOLDBURG,"EXPERIMENTS WITH TURBULENT SOAP FILMS, "PHYS. REV. LETT. 74, 3975, 1995. Ⅱ.12.U.FEY, M. KONIG AND

H. ECKELMANN,"A NEW STROUHAL-REYNOLDS NUMBER RELATIONSHIP FOR TH E CIRCULAR CYLINDER IN THE RANGE 47<RE