

A Quasi-Filled Function Method For Nonlinear Integer Programming *

SHANG You-lin ^{1,2}, ZHANG Lian-sheng ¹, YANG Yong-jian ¹

(1. Math. Dept., Shanghai University, Baoshan, Shanghai 200436, China)

(2. Math. Dept., Henan University of science and technology, Luoyang 471003, China)

Abstract. *This paper gives a new definition of the quasi-filled function for nonlinear integer programming problem, and a quasi-filled function method for nonlinear integer programming problem, which is modified from the filled function method for continuous global optimization (see paper [2]), is presented. Furthermore, we will discuss the properties of the proposed quasi-filled function. Numerical results indicate the efficiency and reliability of the proposed quasi-filled function method.*

Keywords. integer programming, local minimizer, global minimizer, filled function, quasi-filled function, global optimization

References

1. Ge.R.P.(1990), A filled function method for finding a Global Minimizer of a function of Several Variables. Mathematical Programming 46:191-204.
2. Ge.R.P. and Qin.Y.F.(1990), The Global convexized filled functions for Globally Optimization . Applied Mathematics and Computations 35: 54(2):131-158.
3. S.Lucid and V.Piccialli (2002), New classes of globally convexized filled functions for global optimization, Journal of Global optimization 24: 219-236.
4. Ge.R.P. and Qin.Y.F.(1987), A class of filled functions for finding a Global Minimizer of a function of Several Variables. Journal of Optimization Theory and Applications 54(2):241-252.
5. Ge.R.P. and Huang.H.(1989),A continuous approach to nonlinear integer programming. Applied Mathematics and computation 34:39-60.
6. Zhang L.S., Gao F., Yao Y.R.(1998),Continuity Methods for Nonlinear Integer Programming. Chinese Operational Research Transactions 2(2):59-66.
7. Zhu W.X., Zhang L.S.(1997),An approximate algorithm for Nonlinear Integer Programming. Chinese Operational Research Transactions 1(1):72-81.
8. Zhu W.X.(2000),A filled function method for Nonlinear Integer Programming. Chinese ACTA of mathematicae Applicatae Sinica 23(4):481-487.
9. Ryan J.(1995),The Depth and Width of local minima in Discrete Solution Space. Discrete Applied Mathematics (56):75-82.

***Foundation items:** The National Science Foundation of China under Grant (10171118) and Henan University of Science and Technology (2003zy06) .

Biography: SHANG You-lin (1963 -), Associate Professor (E-mail:mathshang@sina.com)

ZHANG Lian-sheng (1937 -), Professor

10. Pirlot M(1996),General local search methods. European Journal of Operational Research (92): 493-511.
11. Vassilev,V., Genova,K.(1994),An approximate algorithm for nonlinear integer programming. European Journal of Operational Research (74).
12. Dixon ,L.C.W.,Gomulka,J. and Herson , S.E. (1976), Reflection on Global Optimization Problems ,in Dixon ,L.C.W.(eds), Optimization in Action ,Academic press ,New York,398-435.
13. Horse ,R., Pardalos, P.M. and Thoai ,N.V. (1995), Introduction to Global Optimization .Kluwer Academic Publishers ,Dordrecht ,Netherland .
14. Pardalos , P.M., Romeijn ,H.E. and Tuy ,H .(2000),Recent Development and Trends in Global Optimization ,Journal of computational and Applied Mathematics 124 ,209-228.
15. Zhang L.S., Ng C., Li D. and Tian W.W.(2004), A new filled function method for global optimization, Journal of Global optimization 28: 17-43.