|  |  |
| --- | --- |
| **ICRAMCS 2022**  **FOURTH EDITION OF THE INTERNATIONAL CONFERENCE ON RESEARCH IN APPLIED MATHEMATICS AND COMPUTER SCIENCE**  **March 24-26, 2022 | Casablanca, Morocco** |  |

|  |
| --- |
| **The Linear Complementarity Problem** |

|  |  |  |
| --- | --- | --- |
| **Communication Info** |  | **Abstract** |
| **Authors:**  Hicham EL BOUANANI1  Youssef EL FOUTAYENI2  Mohamed KHALADI3,4  ***1****LMAEG, Hassan II University of Casablanca, Casablanca, Morocco*  ***2****LAMS, Hassan II University of Casablanca, Casablanca, Morocco*  ***3****LMDP, Cadi Ayad University, Marrakech, Morocco*  ***4****UMMISCO, IRD, France*  **Keywords:**  (1) Linear Complementarity  (2) Mathematical programming  (3) Interior-point method |  | The linear complementarity problem, introduced by Cottle et al. [1], is one of the most widely studied mathematical programming problems. Solving LCP(q,M) for an arbitrary matrix M is NP-complete [2], while there are several classes of matrices M for which the associated LCPs can be solved efficiently. For details of the theory of LCPs, see the books of Cottle et al. [1], Murty [2] and El foutayeni et al. [3-6]. In this communication, we present a new interior-point method to solve this problem. The order of convergence of the proposed method is six. In order to show the efficiency of this method, three examples are demonstrated. We have implemented the MATLAB program for calculating number of iterations required, time taken, and the error norm. We are comparing the results obtained by the proposed method with those obtained by the Yu method and CHKS method. |
| **© ICRAMCS 2022 Proceedings ISSN: 2605-7700** | | |
| **References**  [1] R.W. Cottle, J.S. Pang, R.E. Stone, The linear complementarity problem, Academic Press, 1992.  [2] K.G. Murty, Linear Complementarity, Linear and Nonlinear Programming, Helderman-Verlag, 1988.  [3] Y. El foutayeni, M. Khaladi, A Min-Max Algorithm for Solving the Linear Complementarity Problem, J. Math. Sci. Appl, 1 (2013) 6-11.  [4] Y. El foutayeni, M. Khaladi, General Characterization of a Linear Complementarity Problem, Amer. J. Model. Optim., 1 (2013) 1-5.  [5] Y. El foutayeni, M. Khaladi, Using vector divisions in solving the linear complementarity problem, J. Comput. Appl. Math., 236 (2012) 1919-1925.  [6] Y. El foutayeni, M. Khaladi, A New Interior Point Method for Linear Complementarity Problem, Appl. Math. Sci., 4 (2010) 3289-3306. | | |