THE EFFICIENCY OF CONJUGATE GRADIENT METHODS WITH GLOBAL CONVERGENCE

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DECLARATION BY CANDIDATE

I certify that this report and the project to which it refers is the product of my own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practice of the discipline.

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ABSTRACT

Conjugate gradient methods are usually used to solve any problem that related to large number of variables such as a large linear system of equations. Different conjugate gradient algorithms correspond to different choices for the scalar parameter β_k (Andrei, N. (2013). A simple three-term conjugate gradient algorithm for unconstrained optimization. *Journal of Computational and Applied Mathematics*, *241*, 19-29.). However, if objectif function is linear function, then no different between CG method because it just produce the same results but when applied to general nonlinear functions, often the parameter β_k is computed using some other formulae which do not satisfy the conjugacy condition. Therefore, this study is conducted to compare the efficiency of CG methods base on the number of iteration and CPU time. The global convergence result is established using exact line searches. Numerical result shows that algorithm 2 which is one of the proposed CG methods is more efficiency when compared to other algorithms.

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