

**THREE TERM CONJUGATE GRADIENT FOR SOLVING  
UNCONSTRAINED OPTIMIZATION USING EXACT LINE  
SEARCH**

**ALIA SYAFIQA BINTI SUHAIMI  
NUR HASNAH BINTI MD HASSAN**

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## ABSTRACT

Conjugate gradient (CG) methods are a family of significance methods for solving large-scale unconstrained optimization problems. This is because of the attractive features such as low memory requirement, simple computation and strong global convergence. In this paper, the efficiency of methods is determined by the number of iterations and CPU time. The focus of this study will be on solving using exact line search to solve the problem using three-term conjugate gradient methods. Four well-known classical conjugate gradients methods which are Dai and Yuan (DY), Fletcher-Reeves (FR), Hestenes-Stiefel (HS) and Polack-Ribiere-Polyak (PRP) are tested with four test functions. For every test function, twelve initial points from four geometrical quadrants are chosen, some are close to the solution and some are further away. In this paper, the solutions using exact line search possess global convergence properties. The numerical results are analysed and presented by performance profile introduced by Dolan and Moore.

## DECLARATION BY CANDIDATE

We hereby declare that the thesis is based on our original work, except for quotations and citations which have been dully acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree at UiTM or other institutions.

We certify that this report and the project to which it refers is the product of our 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 practices of the discipline.



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ALIA SYAFIQA BINTI SUHAIMI

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NUR HASNAH BINTI MD HASSAN

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