829/E1

# Review of the citations of the research paper "A variant of Newton's method with accelerated third-order convergence"

P C P Peiris[1], S Weerakoon[1]* and T G I Fernando[2]

[1]*Department of Mathematics, University of Sri Jayewardenepura, Nugegoda.*
[2]*Department of Statistics and Computer Science, University of Sri Jayewardenepura, Nugegoda.*

An unprecedented number of research papers cited the article: "A variant of Newton's Method with Accelerated Third-Order Convergence" published by S Weerakoon and T G I Fernando in the Elsevier journal "Applied Mathematics Letters" in 2000. At the moment it records over 240 citations. The curiosity to know what triggered seemingly overwhelming interest encouraged this review.

Weerakoon-Fernando Method (WFM), as some citations called it, introduced in the above paper suggested an improvement to the Newton's iterative method. The iterative scheme of WFM can be described as follows:

$$x_{n+1} = x_n - \frac{2f(x_n)}{[f'(x_n) + f'(x^*_{n+1})]}\ ,\ n = 0\ ,\ 1\ ,\ 2\ ,\ \ldots\ldots \text{ where } x^*_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

A rigorous proof of the third order convergence of WFM which was supported by computational results by applying the method to a representative cross section of the nonlinear equations was given in the above paper.
This review identifies

(i) what is being cited
(ii) whether there are direct applications of the algorithm given in the WFM
(iii) the improvements proposed to the WFM and
(iv) the similarities and the differences

in the citations of aforementioned, by examining about 50% of them obtained by internet searching and emailing authors directly.

Subsequently, we categorized the articles and compared a selected few using the mathematical program we developed. This review validates the assertion by some of the cited authors that WFM is perfect because of its simplicity and the high order of convergence.

Sunethra.weerakoon@gmail.com Tel: 0777038161