# An Efficient Levenberg-Marquardt Algorithm on Perfomance Evaluation of Error Reduction for Diabetes Condition Classification
## BIOMATH 2024

Yau Balarabe Musa[1], Muhammad Yusuf Waziri[2], Abubakar Sani Waziri[2,3]

[1] Faculty of Natural and Applied Sciences,
Sule Lamido University, Kafin-Hausa, Jigawa state, Nigeria
yaubmusa.mth@slu.edu.ng

[2] Faculty of Physical Sciences,
Bayero University, Kano, Nigeria
mywaziri.mth@buk.edu.ng

[3]Faculty of Natural and Applied Sciences,
Sule Lamido University, Kafin-Hausa, Jigawa state, Nigeria
abubakars.halilu@slu.edu.ng

This manuscript is aimed to provide a case study diabetes medical condition among patients.The study examines the efficient performance of Levenberg-Marquardt (LM) method on a single data set, Aminu Kano Teaching Hospital, Nigeria. This is aimed at minimizing the error in classifying the patients as diabetes positive or negative. With regard to the comparison study, it involves testing of dynamically constructed network and presents a critical analysis of the classification output. Lastly, the study reveals that the LM Technique out performs other similar techniques and consequently emerges as the best ANN leaning rule in providing optimum out put.

*Keywords: optional.*

**References**

[1] [1] Shortliffe EH et al (1990), Medical Informatics: Computer Applications in Medicine, *Addison-Wesley, Reading* .

[2] Maron MJ (1987), *Numerical Analysis: A Practical Approach, MacMillan, New York,*

[3] Hasan Temurtas, Nejat Yumusak, Feyzullah Temurtas (2009), *A comparative study on diabetes disease diagnosis using neural networks,*Expert Systems with Applications,, 36(4), 8610-8615.