An Improved Generalized Regression Neural Network for Type II Diabetes Classification Moeketsi Ndaba1(B), Anban W. Pillay1,2, and Absalom E. Ezugwu1

Abstract.
This paper proposes an improved Generalized Regression Neural Network (KGRNN) for the diagnosis of type II diabetes. Diabetes, a widespread chronic disease, is a metabolic disorder that develops when the body does not make enough insulin or is unable to use insulin effectively. Type II diabetes is the most common type and accounts for an estimated 90% of cases. The novel KGRNN technique reported in this study uses an enhanced K-Means clustering technique (CVE-K-Means) to produce cluster centers (centroids) that are used to train the network. The technique was applied to the Pima Indian diabetes dataset, a widely used benchmark dataset for Diabetes diagnosis. The technique outperforms the best known GRNN techniques for Type II diabetes diagnosis in terms of classification accuracy and computational time and obtained a classification accuracy of 86% with 83% sensitivity and 87% specificity. The Area Under the Receiver Operating Characteristic Curve (ROC) of 87% was obtained.