

The Application of a Neural Network in the Reworking of Accu-Chek to Wrist Bands to Monitor Blood Glucose in the Human Body

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Abstract : The issue of high blood sugar level, the effects of which might end up as diabetes mellitus, is now becoming a rampant cardiovascular disorder in our community. In recent times, a lack of awareness among most people makes this disease a silent killer. The situation calls for urgency, hence the need to design a device that serves as a monitoring tool such as a wrist watch to give an alert of the danger a head of time to those living with high blood glucose, as well as to introduce a mechanism for checks and balances. The neural network architecture assumed 8-15-10 configuration with eight neurons at the input stage including a bias, 15 neurons at the hidden layer at the processing stage, and 10 neurons at the output stage indicating likely symptoms cases. The inputs are formed using the exclusive OR (XOR), with the expectation of getting an XOR output as the threshold value for diabetic symptom cases. The neural algorithm is coded in Java language with 1000 epoch runs to bring the errors into the barest minimum. The internal circuitry of the device comprises the compatible hardware requirement that matches the nature of each of the input neurons. The light emitting diodes (LED) of red, green, and yellow colors are used as the output for the neural network to show pattern recognition for severe cases, pre-hypertensive cases and normal without the traces of diabetes mellitus. The research concluded that neural network is an efficient Accu-Chek design tool for the proper monitoring of high glucose levels than the conventional methods of carrying out blood test.

Keywords : Accu-Check, diabetes, neural network, pattern recognition

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