

Enhanced Pulse Simulator for Medical and Nursing Students

ML Niane^{1#}, AWA Iqbal¹, IT Ponnampuruma¹, and KG Samarawickrama¹

¹Department of Electrical Electronic and Telecommunication Engineering, General Sir John Kotelawala Defence University, Sri Lanka

#39-eng-f6499@kdu.ac.lk

This paper presents a sensation pulse simulator for the training of clinical staff. It is expected to provide healthcare students and clinical staff with a comprehensive understanding of pulse for both educational and diagnostic purposes. The challenge of effectively teaching healthcare professionals, particularly in pulse assessment, is a pressing issue in the field. Traditional teaching methods often fail to provide a truly immersive and effective learning experience for students. To address this issue, a prosthetic hand was developed that serves as a valuable tool for students to practice pulse assessment in a controlled, repeatable, and responsive environment. The algorithm was designed to display pulse alongside other vital physical parameters, highlighting any abnormalities for questioning and further analysis. A 3D design of the arm and a box housing the circuit were prepared. The results were presented in the form of graphs derived from the data collected. The results were analysed through a web page developed as a laptop server using Visual Studio software. These visual representations depict the dynamic parameters of heart rate, blood pressure, and SPO2 level over time, providing valuable tools for monitoring and analysing vital health metrics and informing proactive healthcare decisions.

Keywords: *Bradycardia, LCD display, PCB Design, pulse, ESP32, Tachycardia, vibration motor*