

عنوان مقاله:

Conceptual Design of a Device for Online Calibration of Spirometer Based on Neural Network

محل انتشار:

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خلاصه مقاله:

Daily calibration of spirometry devices plays an important role in promoting the accuracy of pulmonary diagnostic results. It is needed to have more precise and adequate instruments for calibrating spirometry during the clinical use. In this work, a device was designed and developed based on a calibrated-volume syringe and an electrical circuit was also built to measure the air flux. Some colored tapes with specific size and order covered the syringe piston. When the piston moved in front of the color sensor, the input air flow was calculated according to the width of the strips and transferred to the computer. A Radial Basis Function (RBF) neural network estimator used new data to modify the previous estimation function for increasing the accuracy and the reliability. The simulation showed that the root mean square of the error improved from $13.7 \pm 0.37\%$ to $4.2 \pm 0.22\%$, i.e. the calibration curve has improved about 70% .

کلمات کلیدی:

Spirometry, Calibration, Artificial Intelligence, Neural Network Model, Color Sensor

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