

Respiration rate detection based on intensity modulation using plastic optical fiber

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ABSTRACT

This paper presents the implementation of respiration rate measurement via a simple intensity-based optical fiber sensor using optical fiber technology. The breathing rate is measured based on the light intensity variation due to the longitudinal gap changes between two separated fibers. In order to monitor the breathing rate continuously, the output from the photodetector conditioning circuit is connected to a low-cost Arduino kit. At the sensing point, two optical fiber cables are positioned in series with a small gap and fitted inside a transparent plastic tube. To ensure smooth movement of the fiber during inhale and exhale processes as well as to maintain the gap of the fiber during idle condition, the fiber is attached firmly to a stretchable bandage. This study shows that this simple fiber arrangement can be applied to detect respiration activity which might be critical for patient monitoring.

KEYWORDS:

Respiration rate detection; Intensity modulation; Plastic optical fiber