A Non Invasive Technique to Detect Thyroid using Infrared Sensor

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Abstract

Thyroid disease is a condition that affects the function of the thyroid gland. Generally there are four types of thyroid disease i) Hypothyroidism (low function) caused by not having enough thyroid hormones ii) Hyperthyroidism (high function) caused by having too much thyroid hormones iii) Structural abnormalities, such as enlargement of the thyroid gland iv) Tumours which can be benign or cancerous. The symptoms of hypothyroid include fatigue, low energy, weight gain, inability to tolerate the cold, slow heart rate, dry skin and constipation. The symptoms of hyperthyroid include irritability, weight loss, fast heartbeat, heat intolerance, diarrhoea, and enlargement of the thyroid. In both hypothyroidism and hyperthyroidism, there may be swelling of a part of the neck, which is also known as goitre.

The objective of this work is to develop a low cost smart sensing system to sense the human relative skin temperature through non-invasive method for detecting thyroid. It uses two different sensors, one for detecting the relative skin temperature variation and the other for measuring pulse rate of the subject. The microcontroller will process the variation detected by the sensors.
A self-power non-contact thermopile sensor is used for detecting the relative skin temperature and a heart rate monitor is used for heart rate measurement. In this work an Arduino based heartbeat monitor is used which counts the number of heartbeats in a minute. Here a heartbeat sensor module is used which senses the heartbeat upon putting a finger on the sensor. This non invasive technique of thyroid detection gives an accuracy 83.33%.

References

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Index Terms

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Keywords

Relative skin temperature variation, Heart beat monitor.