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Human Emotion Recognition Using Smart Sensors

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By

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Abstract

Emotions play a vital role in people's everyday life. It is a mental state that does not arise through free will and is often accompanied by physiological changes. Therefore monitoring these changes is important as they are perceptions of emotional changes and can help in identifying matters of concern at an early stage before they become serious. Emotion recognition has become an important subject when it comes to human-machine interaction. Various methods have been used in the past to detect and evaluate human emotions. The most commonly used techniques include the use of textual information, facial expressions, speech, body gestures and physiological signals. In this project we have developed an emotion recognition system based on information provided by the physiological signals. These signals are obtained from a skin temperature sensor, a heart rate sensor, and a skin conductance sensor. The amplified and filtered signals from the sensors are input into the microcontroller where all the processing takes place. The microcontroller wirelessly transmits data to a computer where it is stored for data analyses and feature extraction for emotion recognition. The four basic emotions observed in this project are happy (excited), sad, angry and neutral (relaxed). The data has been collected from healthy individuals, including both male and female, with ages ranging from 18 to 72 years. K-means clustering algorithm has been used to cluster data into four groups (emotions). A graphical user interface (GUI) has been designed to communicate with the hardware as well as display real-time emotion(s) for the monitored period. The developed system has shown an overall emotion recognition rate of 86.25%.

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