

REAL-TIME STRESS DETECTION AND PREDICTION USING PULSESENSOR AND ARDUINO UNO

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ABSTRACT

Stress is a prevalent and detrimental condition affecting individuals in various aspects of life. The ability to detect and predict stress levels in real-time can provide valuable insights for personalized intervention and well-being management. This research focuses on developing a system that utilizes PulseSensor and Arduino Uno to achieve real-time stress detection and prediction.

The aim of this study is to explore the feasibility and effectiveness of utilizing physiological signals, specifically heart rate variability (HRV), as an indicator of stress. By integrating PulseSensor, a non-invasive optical heart rate sensor, with Arduino Uno, a versatile microcontroller platform, real-time monitoring of HRV can be achieved. The proposed system captures the pulsatile signal from the fingertip and processes it to extract relevant HRV features.

To validate the system, a comprehensive dataset of stress-related physiological signals will be collected from a diverse group of participants. The methodology involves recruiting individuals and exposing them to controlled stress-inducing stimuli while simultaneously measuring their heart rate using the PulseSensor-Arduino setup. Additionally, self-reported stress levels will be collected using standardized psychological questionnaires for comparison and validation purposes.

The collected data will be subjected to advanced signal processing techniques and machine learning algorithms to develop predictive models for stress detection. By analyzing the extracted HRV features and correlating them with self-reported stress levels, the system aims to accurately predict stress levels in real-time.

The outcomes of this research have the potential to contribute to the development of personalized stress management interventions and early detection systems. Real-time stress detection and prediction using PulseSensor and Arduino Uno can

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empower individuals to proactively manage their stress levels, leading to improved well-being and enhanced performance.

Keywords: stress detection, stress prediction, real-time monitoring, PulseSensor, Arduino Uno, heart rate variability, machine learning.