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A Smart Wearable System for Short-term Cardiovascular Risk Assessment with Emotional Dynamics

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Abstract

Recent innovative treatment and diagnostic methods developed for heart and circulatory system disorders do not provide the desired results as they are not supported by long-term patient follow-up. Continuous medical support in a clinic or hospital is often not feasible in elderly or aging populations; yet, collecting medical data is still required to maintain a high-quality of life. In this study, a smart wearable system design called Cardiovascular Disease Monitoring (CVDiMo), which provides continuous medical monitoring and creates a health profile with the risk of disease over time. Systematic tests were performed with analysis of six different biosignals from two different test groups with 30 participants. In addition to examining the biosignals of patients, using the physical activity results and stress levels deduced from the emotional state analysis achieved a higher performance in risk estimation. In our experiments, the highest accuracy of determining the short-term health status was obtained as 96%.

Keywords: Smart Wearable System, Cardiovascular Disease Monitoring, Healthcare, Signal Processing, Machine Learning, Affective Computing

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