

Application of Image Photoplethysmography Technique in Contactless Heart Rate Monitoring: A State-of-the-Art Review and Proposal for Deployment in the Future in Vietnam.

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Monitoring physiological parameters such as heart rate plays a crucial role in diagnosing and treating heart diseases in the early stage because heart rates convey useful information about the cardiovascular system [1]. In Vietnam's metropolitan hospitals, patients face long wait times for heart rate and blood pressure measurements before they can meet with doctors. This leads to longer overall waiting times and increases the risk of infectious diseases such as COVID-19 and skin diseases. In recent years, the application of video-based contactless heart rate measurement has attracted particular attention from researchers worldwide. The reason for this is that it is convenient for patients and clinical staff [2]. Moreover, it helps reduce operating and maintenance costs. Some recent studies have applied new optimal algorithms to address the technique's drawbacks, such as subject motion artifacts and ambient lighting variations, to enhance accuracy. Another notable finding is that, based on the previous outcomes, the researchers successfully developed a model that can measure remote heart rates for multiple people in a video [3]. This allows for measuring heart rates for a minimum of four people at once. Video heart rate measurements can help reduce waiting times for other patients, signal processing times, and operational costs. This research presents a comprehensive review of contactless heart rate monitoring using the iPPG technique. Based on a PRISMA-guided review of 111 related articles from reputable journals and conference proceedings, my research identifies the limitations of previous studies, proposes research opportunities, and outlines how to deploy study outcomes in real-world scenarios. In this presentation, I will analyse the advantages of the iPPG technique and propose potential application for future development of contact-free heart rate monitoring in Vietnam.

Keywords

image Photoplethysmography (iPPG), heart rate monitoring, contactless, multiple subjects, signal processing, digital health, remote monitor applications

References

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