

Introduction of Integrated Image Deep Learning Solution and How It Brought Laboratorial Level Heart Rate and Blood Oxygen Results to Everyone

Authors : Zhuang Hou, Xiaolei Cao

Abstract : The general public and medical professionals recognized the importance of accurately measuring and storing blood oxygen levels and heart rate during the COVID-19 pandemic. The demand for accurate contactless devices was motivated by the need for cross-infection reduction and the shortage of conventional oximeters, partially due to the global supply chain issue. This paper evaluated a contactless mini program HealthyPai's heart rate (HR) and oxygen saturation (SpO2) measurements compared with other wearable devices. In the HR study of 185 samples (81 in the laboratory environment, 104 in the real-life environment), the mean absolute error (MAE) \pm standard deviation was 1.4827 ± 1.7452 in the lab, 6.9231 ± 5.6426 in the real-life setting. In the SpO2 study of 24 samples, the MAE \pm standard deviation of the measurement was 1.0375 ± 0.7745 . Our results validated that HealthyPai utilizing the Integrated Image Deep Learning Solution (IIDLS) framework, can accurately measure HR and SpO2, providing the test quality at least comparable to other FDA-approved wearable devices in the market and surpassing the consumer-grade and research-grade wearable standards.

Keywords : remote photoplethysmography, heart rate, oxygen saturation, contactless measurement, mini program

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