Contactless Blood Pressure Monitoring

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Introduction

A contactless camera-based pulse detection is one of the resent technologies that can be used for remote monitoring of heart rate (HR). This technology uses digital color video recording to reconstruct a photopletysmsogram (PPG). PPG reflects changes of blood flow generated by rhythmic pulsation of cardiovascular system. The remote image PPG (iPPG) technology can potentially provide unrestricted contactless means of remote monitoring of cardiovascular parameters. The goal of this study was to assess the potential of iPPG in estimating blood pressure (BP).

1. Methods

The iPPG technology was applied for simultaneous HR measurement at designated locations. The time difference in hemodynamics changes between iPPG points was used to estimate pulse transit time (PTT) resulting in iPTT. Correlation between BP and iPTT was used to assess BP. In this pilot, iPTT data were averaged for each 10 seconds and used to investigate the potential value of estimating systolic BP (SBP) using a high speed video camera (420 frames/sec).

2. Results

BP was measured in 5 volunteers at 3 exertion levels during 3 separate visits. Resulting 45 pairs of gold standard SBP and iPTT-derived SBP were compared using correlation analysis. Mean and standard deviation of individual correlations were -0.784 and 0.133.

3. Discussion

Our preliminary results demonstrated high potential of using high-speed cameras for contactless BP monitoring. Further evaluation in larger patient sample is feasible.

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