

Capturing the Stress States in Video Conferences by Photoplethysmographic Pulse Detection

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Abstract : We propose a stress detection method based on an RGB camera using heart rate detection, also known as Photoplethysmography Imaging (PPGI). This technique focuses on the measurement of the small changes in skin colour caused by blood perfusion. A stationary lab setting with simulated video conferences is chosen using constant light conditions and a sampling rate of 30 fps. The ground truth measurement of heart rate is conducted with a common PPG system. The proposed approach for pulse peak detection is based on a machine learning-based approach, applying brute force feature extraction for the prediction of heart rate pulses. The statistical analysis showed good agreement (correlation $r = .79$, $p < 0.05$) between the reference heart rate system and the proposed method. Based on these findings, the proposed method could provide a reliable, low-cost, and contactless way of measuring HR parameters in daily-life environments.

Keywords : heart rate, PPGI, machine learning, brute force feature extraction

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