

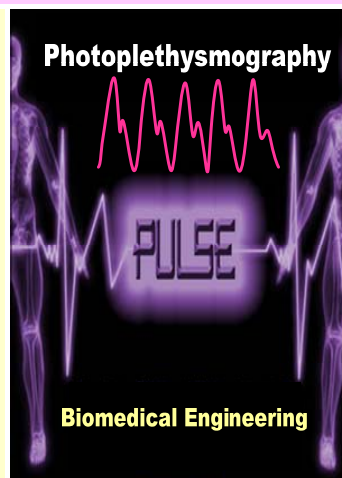


Photoplethysmography in Noninvasive Cardiovascular Assessment

- ❖ Noninvasive biomedical monitoring and noninvasive medical diagnosis are preferred whenever possible to avoid the risks and expense attendant for surgical opening of the body surface. Optical assessments of physiological parameters are very attractive since they often provide simple, noninvasive, continuous physiological monitoring conditions.
- ❖ Photoplethysmography (PPG) is such a simple and low-cost optical technique that allows noninvasively detecting blood volume changes in the microvascular bed of tissue. The most recognized waveform feature is the peripheral pulse, and it is synchronized to each heartbeat.

PPG waveform for Arterial Stiffness Assessment

- ❖ The contour of the digital volume pulse is sensitive to changes in arterial tone induced by vasoactive drugs and is influenced by ageing and large artery stiffness. PPG pulse waveform analysis permits the identification of changes in waveforms and attempts to interpret that change in relation to a change in the mechanical properties of arteries.
- ❖ The assessment of arterial stiffness will make a major contribution to the improved management of cardiovascular disease in the clinical arena and should be included in all future large intervention studies.



Heart rate Variability from PPG Signal

- ❖ Heart Rate Variability (HRV) is one of the most promising and popular markers of cardiac autonomic activity.
- ❖ As the rise and fall of the PPG signal reflects the fluctuations of the heart beats, it is possible that PPG variability does reflect the dynamics of the autonomic nervous system. Our results show that pulse rate variability can serve as an alternative approach to obtain heart rate variability information.
- ❖ The PPG measurements avoid 'white coat' effects on subjects that could happen in ECG recordings.

Noncontact PPG measurement

- ❖ Noncontact PPG concept was introduced to overcome the limitations of current contact probe, such as restriction of measurement sites, contact force from probe and hygiene risk.
- ❖ Noncontact PPG would most likely find applications in specialized areas such as sleep studies, intensive care, neonatal monitoring and patients with burn or healing skin. The applications from bench to bedside need more engineering efforts.

