

Non-contact real-time physiological monitoring system

non-contact heart sensor / heart rate / physiological parameter / photoplethysmography



CONTEXT

Physiological signals are physical quantities taken from the human body by means of sensors in direct contact with the skin. However, in recent years, more and more researchers have focused their efforts on developing non-contact measurement technologies to meet specific constraints: the measurements in the event of burns or severe infections or premature babies, the risks of irritations or allergies, the hygiene, the ethics and the growing affirmation of e-health.

DESCRIPTION

The innovative technology from the Le2i laboratory consists in real-time heart activity measuring from a simple video stream of a person. The image acquisition is carried out using a low cost camera such as the one present on the current digital carriers: computers, smartphones, tablets and embedded systems. This new technology is based on the same photoplethysmography principles as the in-contact sensors, with the fundamental differences that ambient light is used and color variation in the light reflected by the human skin is detected without contact at a distance of a few meters. New signal- and video-processing methods have been integrated to make the system more robust to person's movements and light fluctuations. These algorithms allow the measurement of physiological parameters such as heart rate, breathing rate or emotional state (anxiety, stress...).

COMPETITIVE ADVANTAGES

- It allows measurements in conditions where physical contact with a device is not recommended (illness, fragility) and/or in a magnetic environment such as that of MRI
- It allows measurements without allergic risk and hygienically suitable
- Low cost solution that can be distributed in a completely dematerialized way (no consumables)
- Versatility of integration (computers, smartphones, tablets, etc.) and application (health, safety, transport, etc.)



Markets & applications

Health: physiological monitoring of patients in hospital and by telemedicine

Safety: remote monitoring of public places and establishments by detecting people who are uncomfortable and/or under stress

Transport: driver monitoring to warn of dangerous situations (fatigue, stress, falling asleep)

Psychometrics: study of the stress impact at work or consumer behaviour



Research team

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Intellectual property

International patent (WO2017212174) and software registered



Target partnership

Patent and software licensing

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