



Contactless vital sign sensor

Compact snapshot multispectral multi-aperture camera



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Description

A contactless, camera-based measurement of vital signs is highly desired in many application scenarios to achieve comfort of use, ease of deployment, hygienic application and extraction of contextual information from the scene.

We have developed a real-time multispectral sensor system based on a compact snapshot multi-aperture camera approach combined with LED illumination and dedicated read-out/control boards. It uses remote photoplethysmography to detect minute changes in the brightness and color of the skin that are caused by varying levels of oxygen saturation in the blood.

Applications

- Facilitating medical diagnostics in hospitals
- Telemedicine and contactless sleep diagnostics
- Personalized treatment of cardiovascular diseases
- Driver monitoring for enhanced safety

Technical Specifications

- Nine spectral bandpass filters in the visible/near-infrared wavelength range
- Single compact embossed micro-lens array achieving
 - a high resolution of 1.25 Mpx per channel at f/4
 - a diagonal field-of-view of 40°
- Optimized head capture at 70–130 cm working distance
- Compact dimensions of 100 × 75 × 25 mm³
- Multispectral camera integration with active LED illumination to improve signal-to-noise ratio
- Contactless measurement of vital signs like
 - respiratory rate (RR)
 - heart rate (HR) and
 - oxygen saturation (SpO₂)
- Measurement accuracy (mean error):
 - RR: 1.3 breaths/min
 - HR: 2.8 beats/min
 - SpO₂: 3.8 percentage points

Cover: Compact by design, goVISCAN is suitable for a wide range of applications.

Top: Contactless vital sign monitoring at a workstation.

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