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Titolo	Studies in skin perfusion dynamics : photoplethysmography and its applications in medical diagnostics // Edited by Vladimír Blazek [and three others]
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Edizione	[1st ed. 2021.]
Descrizione fisica	1 online resource (XV, 238 p. 138 illus., 90 illus. in color.)
Collana	Biological and Medical Physics, Biomedical Engineering, , 1618-7210
Disciplina	612.1028
Soggetti	Plethysmography Respiration - Measurement Perfusion (Physiology)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Rhythmical phenomena in dermal perfusion in vivo – Historical remarks and modern measuring strategies using noninvasive optoelectronic sensor concepts -- Influence of controlled breathing (Pranayama) on dermal perfusion -- Optical sensing strategies for skin oxygen saturation monitoring -- Low frequency blood volume rhythms in the skin perfusion obtained by optical sensing -- Synergetic interpretation of patterned vasomotion activity in micro vascular perfusion: application of objective recording of subjective responses to pain -- A self-organized rhythm in peripheral effectors: the intermediary rhythm appears as 0.15 Hz-Band activity -- Photon-tissue interaction modelled by Monte Carlo method for optimized optoelectronic sensor concepts -- Frontiers in contactless space- and time-resolved skin perfusion detection using Photoplethysmography Imaging (PPGI) -- Some clinical applications of functional PPGI perfusion mapping in dermatology -- Motion artefact reduction in PPG signal.
Sommario/riassunto	This book talks about photoplethysmography (PPG) techniques based on computer-aided data processing. In particular, it presents the results of a co-operative Indo-German project on the topic between Indian Institute of Technology at Chennai and RWTH Aachen University.

Measuring system design, experimental details and some preliminary results obtained so far within the framework of this project are presented here. From the investigations carried out so far using the PPG sensors in conjunction with breathing sensors, it has been possible to monitor the 0.125 to 0.15 Hz rhythms in the arterial volumetric changes and to study the influence of breathing on them. These rhythms, which according to medical experts have relevance to psychosomatic conditions e.g. stress or relaxation, can also be addressed to by ancient Indian practices like yoga and meditation. This book presents the results of studying the effects of Indian relaxation techniques like pranayama, meditation, etc. in comparison to western relaxation techniques like autogenic training. So far it has been established that the Indian techniques of relaxation like yoga and meditation are very effective in generating low frequency rhythms in the skin perfusion as monitored by optical sensors. According to medical experts, these low frequency rhythms have a very important bearing on the human physiology and have potential therapeutic implications. This book is meant to provide an overview of the current state-of-knowledge and encourage the next generation of scientists/engineers to carry this work forward, especially on the novel PPG application fields that are of growing importance like pain and stress assessment, detection of peripheral venous saturation and local arterio-venous oxygen consumption as well as contactless space resolved skin perfusion studies with modern camera based PPG technology.
