IR imaging as a tool of novel patient driven medicine

Armand Cholewka
Institute of Biomedical Engineering
University of Silesia in Katowice
Katowice, Poland

22 June 2021

Abstract

Infrared thermography (IRT) is a reliable, non-invasive and non-contact method which can serve as an alternative or supporting imaging technique in medical diagnosis. It can visualize the changes of the surface temperature distribution of the human body fast and remotely, using either passive or active way, to examine the correlations between skin temperature, thermal physiology and health state of the patients. This lecture will (i) provide introductory information for non-specialistic audience to better understand the subject background, (ii) show the potential of IR imaging in different medicine specialities, i.e., physical medicine, oncology, dentistry, angiology, as well as sports medicine, (iii) explain how to use thermovision in diagnostics as well as in evaluation of different types of therapy, including latest studies on using thermal imaging for radiotherapy effects evaluation in patients with breast cancer, and (iv) discuss the possibilities and limitations of IRT, with particular emphasis on the basic principles of thermal imaging physics in relation to the human body investigation.

About the presenter

Prof. Armand Cholewka is a Deputy Director of the Institute of Biomedical Engineering at the University of Silesia in Katowice. He is also the President of the Polish Society of Thermovision Diagnostics in Medicine, President of the Polish Society of Medical Physics of the Silesian Branch, Secretary of the Main Board of the Polish Society of Cryotherapy, as well as a member of the Scientific Council of the Institute of Biomedical Engineering and the head of the Medical Physics Group.

Prof. Cholewka is an experienced academic researcher specialised in multidisciplinary projects related to infrared imaging application in medical diagnostics and evaluation of therapy outcomes, heat transport modelling in tissues under influence of different physical factors, magnetic nanoparticles and their usefulness in cancer therapy, as well as a wide range of medical physics and physical medicine. He is either author or co-author of more than 80 peer-reviewed articles published in journals and conference proceedings, so far supervised two PhD, 60 MSc and BSc students, prepared 50 expertises concerning innovative imaging techniques, several hundred popular science oral presentations, workshops, radio broadcasts etc.

Prof. Cholewka has over fifteen years' experience in realisation of national and international scientific projects within programmes such as those of State Committee for Scientific Research (KBN), National Centre for Research and Development (NCBiR) as well as European Social Funds (POWER 3.01 Programme).

He was also researcher in many scientific institutions such as Technical University of Madrid, Spain; Royal Hampsted Hospital in London, United Kingdom; GL Center Radiology Measurements Laboratory, Poland; Actislink, Poland. He was also awarded for his scientific and didactic achievements, including the Silesian Medical University Rector's awards, University of Silesia Rector's team awards, Bio-Tech-Med Silesia Awards etc. Since 2012 Prof. Cholewka is also a Coordinator of the University of Silesia Youth dedicated to school children and youth.