http://dx.doi.org/10.21611/qirt.2015.0002

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http://dx.doi.org/10.21611/qirt.2015.0002

Selected publications including medical IR thermal imaging:

1. Renkielska, A., Kaczmarek, M., Nowakowski, A., Grudziński, J., Czapiewski, P., Krajewski, A., Grobelny, I., Active dynamic infrared thermal imaging in burn depth evaluation, Journal of Burn Care and Research, 2014 Sep-Oct; 35(5): pp.294-303. doi: 10.1097/BCR.0000000000000059.
2. Moderhak M., Nowakowski A., Kaczmarek M., Siondalski P., Jaworski Ł., Active dynamic Thermography Imaging of Wound Healing Process in Cardiosurgery, Advances in Intelligent Systems and Computing, 284, Information Technologies in Medicine, V. pp. 197 – 202, Springer 2014.
3. Nowakowski A., Kaczmarek M., Renkielska A., Aktywna Termografia Dynamiczna, 193 – 214, and Kaczmarek M., Nowakowski A., Monitorowanie Zabiegów Kardiochirurgicznych, 215 – 242, in ed. Podbielska H., Skrzek A., Biomedyczne zastosowania termowizji, Oficyna Wyd. Politechniki Wrocławskiej, Wrocław 2014 (Biomedical applications of thermovision - book in Polish).
4. Nowakowski A., Siondalski P., Moderhak M., Kaczmarek M., Problems of cardiosurgery wound healing evaluation, pp. 1-9, Proc. QIRT, CD, Bordeaux, 2014
5. Nowakowski A., Quantitative Active Dynamic Thermal IR-Imaging and Thermal Tomography in Medical Diagnostics, pp.7-1 – 7-30, and Nowakowski A., Kaczmarek M., Rogowski J., The Role of Thermal Monitoring in Cardiosurgery Interventions, pp.17-1 – 17-24, in ed. M. Diakides, J.D. Bronzino, D.R Petereson, Medical Infrared Imaging – Principles and Practices, CRC Press, Taylor & Francis Group, Boca Raton, 2013.
6. Wtorek J., Bujnowski A., Rumiński J., Poliński A., Kaczmarek M., Nowakowski A., Assessment of Cardiovascular Risk in Assisted Living, Metrology and Measurement Systems. Volume XIX, 2, 231–244, 2012.
7. Mazur-Milecka M., Nowakowski A., The Comparison of Tracking Methods in Respect of Automation of Animal Behavioral Test, *Metrology and Measurement Systems*, v. XVIII, 1, 91-104, 2011.
8. Nowakowski A., Kaczmarek M., Active Dynamic Thermography - Problems of implementation in medical diagnostics, *Quantitative InfraRed Thermography Journal*, V. 8/1, 89-106, 2011,
9. Mazur-Milecka M., Nowakowski A., An automated system for analysis of mouse movement activity, *Biocybernetics and Biomedical Engineering*.V. 30, Nr 2 (2010), s. 55-65.
10. J. Wtorek, A. Bujnowski, A. Nowakowski, W. Stojek, B. Trzeciak, J. Rogowski, J. Siebert, Monitoring of myocardium state during off-pump coronary artery by-pass grafting, *Physiological Measurement*, 2008
11. Kaczmarek M., Nowakowski A., Suchowirski M., Siebert J., Strojek W., Active dynamic thermography in cardiosurgery, *Quantitative InfraRed Thermography Journal*, v. 4, 1, 107-123, 2007.
12. Rumiński J., Kaczmarek M., Renkielska A., Nowakowski A., Thermal parametric imaging in the evaluation of skin burn depth, *IEEE Transactions on Biomedical Engineering*, v. 54, 2, 303 – 312, 2007.
13. Renkielska A., Nowakowski A., Kaczmarek M., Ruminski J., „Burn depths evaluation based on active dynamic IR thermal imaging—A preliminary study", *Burns*, Vol. 32 (7), 2006, s. 867-875

http://dx.doi.org/10.21611/qirt.2015.0002

Proposal of an invited presentation at QIRTAsia 2015

Abstract:

Medical IR-Thermal Diagnostics – Advantages and Limitations

Antoni Nowakowski

The aim of this presentation will be exchanging information and discussing the present state-of-the-art concerning development of IR-thermal imaging in medical diagnostics. New technology trends in IR-thermal imaging will be discussed with special focus on ADT - Active Dynamic Thermography, TSR – Thermographic Signal Reconstruction and TT - Thermal Tomography as novel approaches in medical applications. It should be underlined that the role of modelling and simulation of thermal processes is crucial for development of all those novel methods.

Multimodality with thermal imaging is another important trend for improvement of medical diagnostics quality. Not less important is the problem of standardization of conditions for proper capture of thermal images and series of images. Some new applications of IR-thermal imaging in medical diagnostics will be discussed. Also limitations of IR-thermography methods will be discussed and clearly shown.