Applied Optoelectronics in Medicine

Aplikovaná optoelektronika v lékařství

Handout Scriptum

to the interdisciplinary lecture at the CTU Prague,
Faculty of Biomedical Engineering and Faculty of Electrical Engineering

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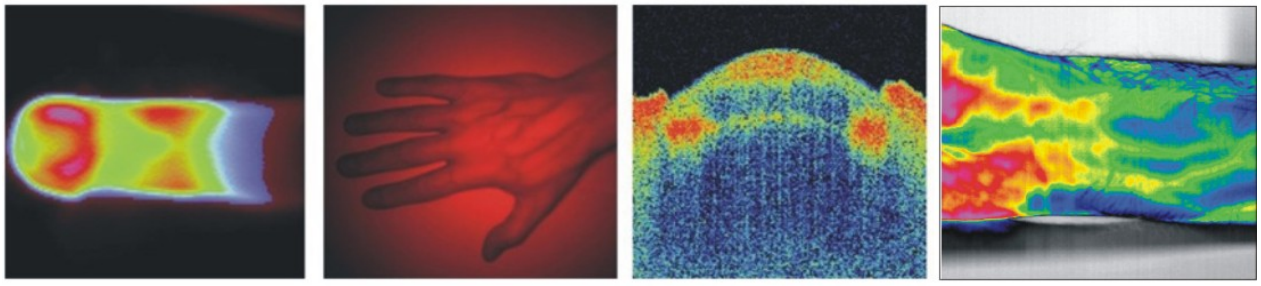

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Topics and content

„It is not enough to know,
it must be applied;
it is not enough to want.
it must be done“

J. W. v. GOETHE (1749 – 1832)

Preface to the fifth, revised edition

The study of this scriptum shouldn’t replace the active participation on the lecture. The main aim of this handout collection is to take notes easier during the teaching sessions and to be helpful for look up and repetition.
Application examples and brief presentations of research results from the Biomedical Optics areas taken by the RWTH Aachen University Chair for Medical Information Technology, Helmholtz-Institute for Biomedical Engineering should also help to make links between theory and applied diagnostic use.
The presented materials are only selected topics and can’t be understood as a closed overview. For the deeper study some related sources are recommended in the literature list.
All constructive criticism is highly welcome and will be helpful for the next edition.

Vladimir Blazek

Aachen, in January 2017

Literature

a) Related titles, recommended for further study

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Brezinski, M.E.: Optical Coherence Tomography: Principles and Applications. Academic Press, Burlington, 2006

Bronzio, J.D.: The Biomedical Engineering Handbook. 2nd ed,, Volume I., Springer, Heidelberg 2000, ISBN 3-540-66351-7

Cooper, J., Cass, T. (Eds.): Biosensors. 2nd ed., Oxford University Press, Oxford 2004, ISBN 0-19-963846-2

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Gizeli, E., Lowe, C.R. (Eds.): Biomolecular Sensors. Taylor & Francis, London 2002

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Morneburg, H. (Hrsg.): Bildgebende Systeme für medizinische Diagnostik. Publicis Publishing, Erlangen 1995, ISBN 978-3-89578-002-8

Prasad, P.N.: Introduction to Biophotonics, Wiley, 2003, ISBN 0-471-29770-9

Riedel, K. et al.: Biosensoren für die Umweltanalytik. Oldenburg, München 2003, ISBN 3-802726509-1

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Tuchin, V.V.: Tissue Optics: Light Scattering Methods and Instruments for Medical Diagnostics. 2nd Ed., SPIE Press, Bellingham 2007

Spichiger-Keller, U.E.: Chemical Sensors and Biosensors for Medical and Biological Applications. Wiley VCH, Weinheim 1998, ISBN 3-527-28855-4

Vo-Dinh, T. (Ed.): Biomedical Photonics Handbook. CRT Press, Boca Raton 2003, ISBN 0-8493-1160

Wang, L.V., Wu, H.I.: Biomedical Optics, Principles and Imaging, Willey & Sons, Hoboken N. J. 2007

Webster, J.G. (Ed.): Medical Instrumentation – Application and Design. 2nd ed., Wiley, New York 1995

Welkowitz, W., Deutsch, S., Akay, M.: Biomedical Instruments – Theory and Design. Academia Press, New York 1997

Wise, D.L. (Ed.): Bioinstrumentation and Biosensors. Dekker, New York 1991

b) Related web sites, recommended for further information

- Center for Bioelectronics, Biosensors and Biochip www.c3b.vcu.edu
- Biosensors and other medical and environmental probes www.ornl.gov/info
- Mendel´s experiment animation www.mendel-museum.org
- Universe, expansion and the Big Bang theory www.space.com
- Cosmic microwave background radiation lambda.gsfc.nasa.gov
- How your heart works science.howstuffworks.com/heart.htm
- How vision works science.howstuffworks.com/eye.htm
- Ways of thinking about light science.howstuffworks.com/light.htm