

Publications, Patents, Talks

2014

Philips Lehrstuhl für Medizinische Informationstechnik
Helmholtz-Institut für Biomedizinische Technik
Rheinisch-Westfälische Technische Hochschule Aachen

*Philips Chair for Medical Information Technology
Helmholtz-Institute for Biomedical Engineering
RWTH Aachen University*

Director:
Univ.-Prof. Dr.-Ing. Dr. med. Steffen Leonhardt

Buchbeiträge mit anonymem Gutachterwesen 2014 / Peer-reviewed book chapters 2014

- [1] M. Ulbrich, M. Czaplík, A. Pohl, M. Zink, S. Leonhardt, „Estimation of blood alcohol content with bioimpedance spectroscopy“, Lecture Notes on Impedance Spectroscopy, Volume 5, Pages xx, CRC Press January 2015, Print ISBN:978-1-13-802754-1.

Patentanträge mit Beteiligung des Lehrstuhls 2014 / *Patent Applications*

- [1] D. Teichmann, S. Leonhardt, J. Foussier, T. Wartzek, M. Walter, „Sensoranordnung zur Erfassung von Vitalparametern“, DE 10 2014 104 465.7, Anmeldetag: 28. März 2014.

**Artikel in Zeitschriften
mit anonymem Gutachterwesen 2014 /
*Papers in peer-reviewed Journals 2014***

- [1] A. Pomprapa, D. Schwaiberger, B. Lachmann, S. Leonhardt, "A mathematical model for carbon dioxide elimination: an insight for tuning mechanical ventilation", **Eur J Appl Physiol**. 2014 Jan;114(1):165-75. doi: 10.1007/s00421-013-2754-0.
- [2] P. Maciejasz, J. Eschweiler, K. Gerlach-Hahn, A. Jansen-Troy, S. Leonhardt, "A survey on robotic devices for upper limb rehabilitation", **J Neuroeng Rehabil**. 2014 Jan 9;11:3. doi: 10.1186/1743-0003-11-3.
- [3] Y. Yao, C. Brüser, U. Pietrzyk, S. Leonhardt, S. van Waasen, M. Schiek, "Model-based verification of a non-linear separation scheme for ballistocardiography", **IEEE J Biomed Health Inform**. 2014 Jan;18(1):174-82. doi: 10.1109/JBHI.2013.2261820.
- [4] D. Teichmann, A. Kuhn, S. Leonhardt, M. Walter, "The MAIN Shirt: a textile-integrated magnetic induction sensor array", **Sensors** (Basel). 2014 Jan 9;14(1):1039-56. doi: 10.3390/s140101039.
- [5] N. Blanik, A.K. Abbas, B. Venema, V. Blazek, S. Leonhardt, "Hybrid optical imaging technology for long-term remote monitoring of skin perfusion and temperature behaviour", **J Biomed Opt**. 2014 Jan;19(1):16012. doi: 10.1117/1.JBO.19.1.016012.
- [6] A. K. Abbas, S. Leonhardt, "Intelligent neonatal monitoring based on a virtual thermal sensor", **BMC Med Imaging**. 2014 Mar 2;14:9. doi: 10.1186/1471-2342-14-9.
- [7] T. Wartzek, C. Brüser, M. Walter, S. Leonhardt, "Robust sensor fusion of unobtrusively measured heart rate", **IEEE J Biomed Health Inform**. 2014 Mar;18(2):654-60. doi: 10.1109/JBHI.2013.2274211.
- [8] C. B. Pereira, M. Czaplik, N. Blanik, R. Rossaint, V. Blazek, S. Leonhardt, "Contact-free monitoring of circulation and perfusion dynamics based on the analysis of thermal imagery", **Biomed Opt Express**. 2014 Mar 5;5(4):1075-89. doi: 10.1364/BOE.5.-001075.
- [9] T. Vollmer, P. Schauerte, M. Zink, S. Glöggler, J. Schiefer, M. Schiek, U. Johnen, S. Leonhardt, "Individualized biomonitoring in heart failure - Biomon-HF "Keep an eye on heart failure - especially at night"", **Biomed Tech** (Berl). 2014 Apr 1;59(2):103-11. doi: 10.1515/bmt-2013-0024.
- [10] A. H. Ismail, N. Trué, T. Gross, B. Eilebrecht, M. Walter, G. Schlieper, F. Eitner, J. Floege, S. Leonhardt, "Usefulness of Bioimpedance Spectroscopy for detection of Hypotensive Episode during Dialysis", **ASAIO J**. 2014 May 14, 60(5):564-575. doi: 10.1097/MAT.0000000000000104.
- [11] J. Foussier, D. Teichmann, J. Jia, B. Misgeld, S. Leonhardt, "An adaptive Kalman filter approach for cardiorespiratory signal extraction and fusion of non-contacting sensors", **BMC Med Inform Decis Mak**. 2014 May 9;14:37. doi: 10.1186/1472-6947-14-37.

- [12] S. Weyer, M.D. Zink, T. Wartzek, L. Leicht, K. Mischke, T. Vollmer, S. Leonhardt, „Bioelectrical impedance spectroscopy as a fluid management system in heart failure”, **Physiol Meas.** 2014 Jun;35(6):917-30. doi: 10.1088/0967-3334/35/6/917.
- [13] M. Ulbrich, J. Mühlsteff, A. Sipilä, M. Kampi, A. Koskela, M. Myry, T. Wan, S. Leonhardt, M. Walter, “The IMPACT shirt: textile integrated and portable impedance cardiography”, **Physiol Meas.** 2014 Jun;35(6):1181-96. doi: 10.1088/0967-3334/35/6/1181.
- [14] M. Czaplik, C. Hoog Antink, R. Rossaint, S. Leonhardt, “Application of internal electrodes to the oesophageal and tracheal tube in an animal trial: evaluation of its clinical and technical potentiality in electrical impedance tomography”, **J Clin Monit Comput.** 2014 Jun;28(3):299-308. doi: 10.1007/s10877-013-9536-4.
- [15] A. Pomprapa, D. Schwaiberger, P. Pickerodt, O. Tjarks, B. Lachmann, S. Leonhardt, “Automatic protective ventilation using the ARDSNet protocol with the additional monitoring of electrical impedance tomography”, **Crit Care.** 2014 Jun 23;18(3):R128.
- [16] B. Venema, H. Gehring, I. Michelsen, N. Blanik, V. Blazek, S. Leonhardt, “Robustness, specificity, and reliability of an in-ear pulse oximetric sensor in surgical patients”, **IEEE J Biomed Health Inform.** 2014 Jul;18(4):1178-85. doi: 10.1109/JBHI.-2013.2292118.
- [17] M. Ulbrich, J. Mühlsteff, S. Leonhardt, M. Walter, „Influence of physiological sources on the impedance cardiogram analyzed using 4D FEM simulations“, **Physiol Meas.** 2014 Jul;35(7):1451-68. doi: 10.1088/0967-3334/35/7/1451.
- [18] R. Pikkemaat, S. Lundin, O. Stenqvist, R. D. Hilgers, S. Leonhardt, “Recent advances in and limitations of cardiac output monitoring by means of electrical impedance tomography”, **Anesth Analg.** 2014 Jul;119(1):76-83. doi: 10.1213/ANE.0000000000000241.
- [19] I.M. Elixmann, M. Kwiecien, C. Goffin, M. Walter, B. Misgeld, M. Kiefer, W.I. Steudel, K. Radermacher, S. Leonhardt, “ Control of an Electromechanical Hydrocephalus Shunt - a New Approach”, **IEEE Trans Biomed Eng.** 2014 Sep;61(9):2379-88. doi: 10.1109/TBME.2014.2308927.
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- [21] T. Schlebusch, J. Orschulik, J. Malmivuo, S. Leonhardt, D. Leonhäuser, J. Grosse, M. Kowollik, R. Kirschner-Hermanns, M. Walter, "Impedance Ratio Method for Urine Conductivity-Invariant Estimation of Bladder Volume", **Journal of Electrical Bioimpedance** 2014; vol. 5:48-54. doi:10.5617/jeb.895
- [22] T. Schlebusch, W. Fichtner, M. Mertig, S. Leonhardt, "Unobtrusive and comprehensive health screening using an intelligent toilet system", **Biomed Tech**, 2014 Okt. [Epub ahead of print].

- [23] M. Koeny, N. Blanik, X. Yu, M. Czaplik, M. Walter, R. Rossaint, V. Blazek, and S. Leonhardt, "Using Photoplethysmography Imaging For Objective Contactless Pain Assessment," **Acta Polytech.**, vol. 54, no. 4, pp. 275–280, Aug. 2014.
- [24] M. Köny, S. Bertling, M. Czaplik, V. Blazek and S. Leonhardt, "Respiratory Rate Estimation in Postoperative Care-State of the Art and Perspectives", **The Clinician and Technology Journal**, vol. 2–2014–44, no. 2, pp. 25–29, 2014.
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- [26] B.J.E. Misgeld, K. Gerlach-Hahn, D. Rüschen, A. Pomprapa, and S. Leonhardt, "Control of Adjustable Compliant Actuators", **Machines**, 2(2):134 - 157; 2014. doi: 10.3390/machines2020134.
- [27] K. Lunze, M. Walter, S. Leonhardt, „A Switching hybrid control method for automatic blood glucose regulation in diabetic minipigs“, **Biomedical Signal Processing and Control**, Vol. 13, Sept. 2014, pp 237-246, doi:101016/j.bspc.2014.05.004.
- [28] K. Lunze, A. Woitok, M. Walter, M.D. Brendel, M. Afify, R. Tolba, S. Leonhardt, „Analysis and modeling of glucose metabolism in diabetic Göttingen minipigs“, **Biomedical Signal Processing and Control**, Vol. 13, Sept. 2014, pp 132-141, doi:101016/j.bspc.2014.04.003.
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- [30] J. Foussier, D. Teichmann, J. Jia, B.J.E. Misgeld, S. Leonhardt, „An adaptive Karman filter approach for cardiorespiratory signal extraction and fusion of non-contacting sensors“, **BMC Medical Informatics and Decision Making**, Vol 14, May 2014, doi: 10.1186/1472-6947-14-37.
- [31] X. Long, P. Fonseca, R. Haakma, R. M. Aarts, J. Foussier, "Spectral Boundary Adaption on Heart Rate Variability for Sleep and Wake Classification", **International Journal on Artificial Intelligence tools**, 2014, Vol. 23, no. 3, 20 S., doi: 10.1142/S0218213014600021.
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- [33] S. Lehmann, K. Tenbrock, S. Schradling, R. Pikemaat, Ch. Hoog Antink, S. Santos, J.W. Spillner, N. Wagner, S. Leonhardt, "Monitoring of lobectomy in cystic fibrosis with electrical impedance tomography – a new diagnostic tool", **Biomed Tech (Berl)**, 2014, Vol. 59, no. 6, pp.545-548, 2014, doi: 10.1515/bmt-2014-0019.

- [34] S. Lehmann, C. Pfannenstiel, F. Friedrichs, K. Kröger, N. Wagner, K. Tenbrock, „Omalizumab: a new treatment option for allergic bronchopulmonary aspergillosis in patients with cystic fibrosis“, **Therapeutic Advances in Respiratory Disease**, 2014, Vol 8, no. 5, pp. 141-149, doi: 10.1177/1753465814547517.

In press:

- [35] C. Brüser, J. M. Kortlainen, S. Winter, M. Tenhunen, J. Pärkkä, S. Leonhardt, „Improvement of force-sensor-based heart rate estimation using multi-channel data fusion“, **IEEE J Biomed Health Inform.** 2014 [Epub ahead of print]. doi: 10.1109/JBHI.2013.2292118.
- [36] M. Ulbrich, J. Mühlsteff, D. Teichmann, S. Leonhardt, M. Walter, „A Thorax Simulator for Complex Dynamic Bioimpedance Measurements with Textile Electrodes“, **IEEE Trans Biomed Circuits Syst.** 2014 Aug 19. [Epub ahead of print].
- [37] C. Brüser, N. Strutz, S. Winter, S. Leonhardt, M. Walter, „Monte-Carlo Simulation and Automated Test Bench for Developing a Multichannel NIR-Based Vital-Signs Monitor“, **IEEE Trans Biomed Circuits Syst.** 2014 Sep 4, doi: 10.1109/TBCAS.2014.2340703, [Epub ahead of print].
- [38] C. Brendle, B. Rein, A. Niesche, A. Korff, K. Radermacher, B. Misgeld, S. Leonhardt; „Electrical Bioimpedance-Controlled Surgical Instrumentation“, **IEEE Trans Biomed Circuits Syst**, 2014, doi: 10.1109/TBCAS.2014.2363211, [Epub ahead of print].
- [39] D. Rüschen, S. Kim, S. Leonhardt, B.J.E. Misgeld, „Orientierungsschätzung mit einem Sliding Mode-Beobachter auf Basis Body Sensor Network-integrierter Inertialsensoren“, **at – Automatisierungstechnik**, 2014 [accepted: 19 Oct 2014].
- [40] M. Ulbrich, J. Mühlsteff, M. D. Zink, F. Wolf, S. Weyer, T. Vollmer, S. Winter, S. Leonhardt, M. Walter, „Pulmonary fluid accumulation and its influence on the Impedance Cardiogram: Comparison Between a Clinical Trial And FEM Simulations“, **Clinician and Technology Journal**, 2014 [accepted: 8 November 2014; will be printed in first week of December].
- [41] A. Pomprapa, D. Muanghong, M. Köny, S. Leonhardt, P. Pickerodt, O. Tjarks, D. Schwaiberger, B. Lachmann, „Artificial intelligence for closed-loop ventilation therapy with hemodynamic control using the open lung concept“, **International Journal of Intelligent Computing and Cybernetics**, 2014 [accepted: 25 Nov 2014].
- [42] S. Weyer, T. Menden, L. Leicht, S. Leonhardt, T. Wartzek „Development of a wearable multi-frequency impedance cardiography device“ **Journal of Medical Engineering & Technology**, 2014, [accepted: 16 Nov 2014].

Submitted:

- [43] S. Weyer, H. Weber, C. Kleeberg, T. Wartzek, S. Leonhardt “Development of a real-time, semi capacitive impedance phlebography device”, **Journal of Electrical Bioimpedance**, 2014, submitted.
- [44] B.J.E. Misgeld, D. Rüschen, S. Schwandtner, S. Heinke, M. Walter, S. Leonhardt, Robust decentralised control of a hydrodynamic human circulatory system simulator, **Biomedical Signal Processing and Control**, 2014, [submitted]
- [45] B.J.E. Misgeld, I.M. Elixmann, L. Fahnster, M. Walter, M. Weinzierl, W.-I. Steudel, and S. Leonhardt, “Design and Evaluation of an Automatic Extraventricular Drainage Control System”, **Transactions on Control Systems Technology**, 2014, submitted
- [46] N. Blanik, B. Venema, V. Blazek, S. Leonhardt, „Remote Pulse Oximetry Imaging – Fundamentals and Applications“, **The Clinician and Technology Journal**, 2014, submitted.
- [47] C. Brüser, C. Hoog Antink, T. Wartzek, M. Walter, S. Leonhardt, “Ambient and unobtrusive cardiorespiratory monitoring techniques“, **IEEE Reviews in Biomedical Engineering**, submitted for review, 2014.

Konferenzbeiträge mit Beteiligung des Lehrstuhls 2014 / *Conference Proceedings 2014*

AAL

- [1] T. Wartzek, S. Leonhardt, "Challenges of unobtrusive monitoring of cardiac activity - Methods for artifact detection", Conference: Wohnen – Pflege – Teilhabe – „Besser leben durch Technik“, 7. Deutscher AAL-Kongress, Berlin, Germany, Jan 21st – 22nd, 2014.

BioWireleSS

- [2] D. Teichmann, T. Bartelt, S. Leonhardt, M. Walter, "A Mobile and Wireless Approach for Cardiac Output Monitoring"; *IEEE Topical Conference on Biomedical Wireless Technologies, Networks & Sensing Systems (BioWireleSS)*, Newport Beach, Jan. 25th – 28th, 2014.
- [3] B. Venema, M. Wolke, V. Blazek, S. Leonhardt, „A Power Consumption Optimized Reflective In-ear Pulse Oximeter for Mobile Health Monitoring“; *IEEE Topical Conference on Biomedical Wireless Technologies, Networks & Sensing Systems (BioWireleSS)*, Newport Beach, Jan. 25th – 28th, 2014.

SPIE

- [4] N. Blanik, C. Blazek, C. Pereira, V. Blazek, S. Leonhardt, "Frequency-selective quantification of skin perfusion behavior during allergic testing using photoplethysmography imaging", SPIE 2014 Medical Imaging 9034, San Diego, USA, 15 – 20. Feb, 2014

EIT

- [5] J. Orschulik, T. Schlebusch, S. Leonhardt, "Impedance-Cystovolumetry from Multifrequency Electrical Impedance Tomography"; 15th International Conference on Biomedical Applications of Electrical Impedance Tomography (EIT2014), Gananoque, April 24th - 26th, 2014.

POSTER

- [6] S. Liebich, C. Brüser, "Deconvolution-based physiological signal simplification for periodical parameter estimation", 18th International Student Conference on Electrical Engineering (POSTER 2014). Prague, Czech Republic, May 15, 2014.
- [7] M. Ulbrich, F. Wolf, S. Weyer, "The Influence of Pulmonary Fluid Accumulation on the Impedance Cardiogram: Comparing FEM Simulations with a Clinical Trial", 18th International Student Conference on Electrical Engineering (POSTER 2014). Prague, Czech Republic, May 15, 2014.
- [8] L. Leicht, S. Weyer, "Improvement of Signal Quality in Capacitive ECG Systems by means of Independent Component Analysis". 18th International Student Conference on Electrical Engineering (POSTER 2014). Prague, Czech Republic, May 15, 2014.

- [9] A. Pohl, M. Thore, "Real-Time IEGM Detection for Cardiac Neuromodulation Aiming to Decrease Heart Rate", 18th International Student Conference on Electrical Engineering (POSTER 2014). Prague, Czech Republic, May 15, 2014.
- [10] D. Rüschen, "A Matlab/Simulink Framework for Automated Optimal Navigation Filter Tuning", 18th International Student Conference on Electrical Engineering (POSTER), Prag, May 15th, 2014.
- [11] D. Löschcke, T. Schlebusch, S. Weyer; "A Wearable System for Bladder Volume Estimation Using Multi-Frequency Impedance Tomography"; Poster 2014, 18th International Student Conference on Electrical Engineering, Prag, May 15th; 2014
- [12] M. Koeny, S. Bertling, and M. Czaplík, "Advances in Respiratory Rate Estimation in Postoperative Care"; Poster 2014, 18th International Student Conference on Electrical Engineering, Prag, May 15 th; 2014
- [13] B. Venema, "Advanced Monte Carlo Simulation of Dermal Light Distribution for Remission Photoplethysmography"; Poster 2014, 18th International Student Conference on Electrical Engineering, Prag, May 15 th; 2014
- [14] M. Paul, N. Blanik; "A Modality Fusion Approach for Stress and Pain Recognition"; Poster 2014, 18th International Student Conference on Electrical Engineering, Prag, May 15 th; 2014
- [15] N. Blanik, "System Concept and Advanced Algorithms for Remote Pulse Oxymetry"; Poster 2014, 18th International Student Conference on Electrical Engineering, Prag, May 15 th; 2014

ACC

- [16] B.J.E. Misgeld, A. Pomprapa, S. Leonhardt, "Robust control of compliant actuators using positive real H2-controller synthesis", 2014 American Control Conference (ACC), June 4-6, 2014, Portland, Oregon, USA.

BSN

- [17] D. Teichmann, D. De Matteis, M. Walter, S. Leonhardt, "A Bendable and Wearable Cardiorespiratory Monitoring Device Fusing Two Noncontact Sensor Principles"; *11th International Conference on Wearable and Implantable Body Sensor Networks (BSN)*, Zurich, pp. 58–63, June 16th – 19th, 2014.

RGC

- [18] C. Brüser, S. Winter, S. Leonhardt, "Advances in Unobtrusive Cardiac Monitoring Using Ballistocardiography". X. Russian-German Conference on Biomedical Engineering (RGC 2014), St. Petersburg, June 25-27, 2014.
- [19] L. Leicht, S. Leonhardt, "Healthcare Applications in Automotive Environments". X. Russian-German Conference on Biomedical Engineering (RGC 2014), St. Petersburg, June 25-27, 2014.
- [20] C. Hoog Antink, C. Brüser, S. Leonhardt, "On the Way to Artefact Detection and Compression: Blind Deconvolution for Cardiac Signals", X. Russian-German Conference on Biomedical Engineering (RGC 2014), St. Petersburg, June 25-27, 2014.
- [21] A. Pomprapa, D. Muanghong, M. Köny, S. Leonhardt, P. Pickerodt, O. Tjarks, D. Schwaiberger, B. Lachmann, "Computerized ventilation therapy with automatizing Noradrenaline dose using state-of-the-art Open Lung Management", X. Russian-

German Conference on Biomedical Engineering (RGC 2014), St. Petersburg, June 25-27, 2014.

- [22] J. Orschulik, S.A. Santos, S. Leonhardt, "Electrical Impedance Tomography: Current Applications and Future Fields", X. Russian-German Conference on Biomedical Engineering (RGC 2014), St. Petersburg, June 25-27, 2014.

ICCAI

- [23] C. Brendle, J. Kühn, A. Stollenwerk, M. Wardeh, R. Kopp, B. Misgeld, S. Leonhardt, M. Walter, "Concept for a cooperative gas exchange management of Extracorporeal Lung Assist and Mechanical Ventilation; 13th International Conference on Complexity in Acute Illness (ICCAI), Charlottesville, Virginia, USA, 31.7 - 3.8. 2014

IFAC

- [24] A. Pomprapa, S. Alfocea, C. Goebel, B. Misgeld, S. Leonhardt, "Funnel control for oxygenation during artificial ventilation therapy", The 19th IFAC World Congress, Cape Town, Aug 24th - 29th, 2014.

- [25] B.J.E. Misgeld, J. Stille, A. Pomprapa, S. Leonhardt, EPAIA: Design, modelling and control of a novel electro-pneumatic adaptable impedance actuator, The 19th IFAC World Congress, Cape Town, Aug 24th - 29th, pp. 6599-6605, 2014.

MMAR

- [26] *V. Malita, B.J.E. Misgeld, S. Leonhardt*, Design of an Adaptive Gait Trajectory Controller Based on a Hybrid Two-Legged Robot Model, 19th International Conference on Methods and Models in Automation and Robotics (MMAR), Miodzydroje, Poland, Sep. 2 – 5, 2014

CINC

- [27] A. Pohl, C. H. Lubba, M. Thore, N. Hatam, S. Leonhardt, "High Specificity IEGM Beat Detection by Combining Morphological and Temporal Classification for a Cardiac Neuromodulation System", IEEE Computing in Cardiology (CinC), Cambridge, USA, Sept. 7th – 10th, 2014.

- [28] C. Hoog Antink, C. Brüser, S. Leonhardt, "Multimodal Sensor Fusion of Cardiac Signals via Blind Deconvolution: A Source-Filter Approach", IEEE Computing in Cardiology (CinC), Cambridge, USA, Sept. 7th – 10th, 2014.

ESAO

- [29] D. Rüschen, S. Schwandtner, F. Al-Rashid, C. Nix, S. Leonhardt, M. Walter, „Towards Closed-Loop VAD Control“, 41st Annual ESAO Congress, Roma, Sep 17th - 20th, 2014.

ISRBP

- [30] S. Schwandtner, D. Rüschen, C. Nix, F. Al-Rashid, J. Geens, S. Leonhardt, „Real Time Assessment of the Left Ventricular Pumping Cycle Using an Optical Pressure Gauge During Impella Heart Support“, 22nd Annual Congress of the International Society for Rotary Blood Pumps (ISRBP), San Francisco, USA, 25. – 27. September; 2014.

DGBMT

- [31] L. Leicht, B. Eilebrecht, S. Weyer, T. Wartzek, S. Leonhardt, „Active humidification for capacitive-resistive ECG-systems“, 48th Annual Conference of the DGBMT, Oct 8th-10th, 2014.
- [32] T. Wartzek, J. Ferch, S. Leonhardt, „Analysis of conductive and capacitive moisture detection in a bed“, 48th Annual Conference of the DGBMT, Oct 8th-10th, 2014.
- [33] C. Ngo, B. Misgeld, T. Vollmer, S. Winter, S. Leonhardt, „Linear affine lung mechanics model with emphasis on pleural dynamics“, 48th Annual Conference of the DGBMT, Oct 8th-10th, 2014.
- [34] B.J.E. Misgeld, T. Schauer, O. Simanski, Automation of Medical Systems – Current Techniques, Limitations and Challenges, 48th Annual Conference of the DGBMT, Oct 8th-10th, 2014.
- [35] B. Venema, N. Blanik, V. Perlitz, S. Laffar, H.G. Ortlepp, S. Borik, J.-P. Jansen, M. Koeny, V. Blazek, S. Leonhardt, „Biofeedback-Smart Modality Fusion for Clinical, Home and Outdoor Health Monitoring“, 48th Annual Conference of the DGBMT, Oct 8th-10th, 2014.

MobiHealth

- [36] B.J.E. Misgeld, M. Lueken, S. Kim, S. Leonhardt, Body sensor network-based spasticity detection, Athens, 3-5 November 2014.

DGNM-Jahrestagung

- [37] A. Pohl, A. Götzenich, P. Schauerte, S. Leonhardt, R. Autschbach, and N. Hatam, „Neuromodulation am Herzen – Senkung zu hoher Herzfrequenzen“, 10. Jahrestagung der Deutschen Gesellschaft für Neuromodulation (DGNM), Bad Oeynhausen, Nov 28th – 29th, 2014.

Eingeladene Vorträge 2014 / Invited Talks and Lectures 2014

- [1] S. Leonhardt, „Bestimmung des Herzschlagvolumens und der Perfusion mit der EIT“, **24. Symposium Intensivmedizin & Intensivpflege**, Bremen, 19. – 21. Feb. 2014.
- [2] S. Leonhardt, „Progress in Perfusion Imaging with EIT“, **15th Int. Conf. on Biomedical Applications of Electrical Impedance Tomography**, Gananoque, Ontario, CA, April 24-26, 2014.
- [3] S. Leonhardt, “Contact-Free Methods for Clinical Monitoring”, **IEEE Symposium on Medical Electronic Devices and Systems**, MIT, Boston, May 8th – 9th, 2014.
- [4] S. Leonhardt, “Methods for Contact-free Monitoring of Vital Signs – Current Applications and Challenges”, **Seminar at the Department of Biomedical Engineering, University of Ghana at Legon**, April 14th, 2014.
- [5] S. Leonhardt, “The Car as a Location of Medical Diagnosis and Treatment”, **10th Russian-German Conference (RGC 2014)**, 25. – 27.06.2014, St. Petersburg, Russia.
- [6] S. Leonhardt, „Automatisierung des ARDS-Network-Beatmungsprotokolls“, **Hauptstadtkongress (HAI 2014) der Deutschen Gesellschaft für Anästhesiologie und Intensivmedizin (DGAI)**, Berlin, 18. – 20. Sep. 2014.
- [7] S. Leonhardt, “Non-contact monitoring of vital signs”, **25th Annual Meeting of the European Society for Computing and Technology in Anesthesia and Intensive Care (ESCTAIC)**, Oct. 23rd - 25th, 2014.
- [8] S. Leonhardt, “Closed-loop Control of Ventilation”, **12th Guidelines and Protocols in Anesthesia and Intensive Care Congress**, Timisoara City, Romania, Oct. 25th, 2014.
- [9] S. Leonhardt, „Automatisierte Versorgung im Notfall - vom Defibrillator zur Beatmung“, **Fachkonferenz „Maschinen entscheiden – vom Cognitive Computing zu autonomen Systemen**, 12. Nov. 2014, Sheraton München Arabellapark Hotel.
- [10] S. Leonhardt, “Automotive meets Medicine – Kontaktfreie Diagnostik im KFZ”, **14. Aachener Interdisziplinären Verkehrssymposium**, 14. Nov. 2014, Volkswagen Zentrum Aachen, Trierer Straße 169, 52078 Aachen.
- [11] S. Lehmann, „Omalizumab als neue Therapieoption bei Cystischer Fibrose (CF) und Allergischer Bronchopulmonaler Aspergillose (ABPA)“, **17. Deutsche Mukoviszidose-Tagung**, Würzburg, 20. – 22. November 2014.
- [12] M. Koeny, M. Czaplik, M. Walter, R. Rossaint, and S. Leonhardt, “Perspectives for Anesthesia in a Manufacturer Independent Networked Operating Room Data Fusion and Decision”, **48th Annual Conference of the DGBMT**, Oct 8th-10th, 2014.

- [13] B.J.E. Misgeld, „Moderne Methoden zur Regelung von medizintechnischen Systemen“, **Initiative „Biokybernetik“**, Großkarlbach, Pfalz, 20. - 21. Nov. 2014.

**Organisation von eingeladenen Sitzungen
im Jahr 2014**
Organisation of special sessions in 2014

- [1] B. Misgeld and S. Leonhardt: Towards Patient-Oriented Modelling and Control, Invited Session, The 19th IFAC World Congress, Cape Town, Aug 24th - 29th, 2014.